

abroad; vast tracts of land were redeemed from a state of marsh by engineers from Holland: all these important undertakings were conducted in a rude and imperfect manner; the philosopher had not directed his studies to what was useful, and mathematical knowledge was slighted by the unlearned practitioner."

Of the ports and harbours of Britain he gives very full information: lighthouses are fully treated of, especially the Eddystone; and a history and description of the principal bridges are given with much valuable information. From the latter section we learn that:—

"The total cost for building and completing Blackfriars-bridge, and making the avenues thereto, was as follows:—

	£.	s.	d.
To Joseph Dixon, mason	111,569	2	0
To Dixon and Spencer, carpenters	35,841	8	6
To Messrs. Cox and Co.	10,687	16	7
To William Bryant, Blacksmith	3,555	11	4
To sundry other artificers	9,194	14	11

	£.	s.	d.
Surgeon's commission of 5 per cent. on all artificers' bills, and 1 per cent. on the purchases and sales of premises	9,139	1	8
Five years' salary for his constant attendance on the meetings of the committee, and for inspecting and taking care of the bridge, streets, roads, sewers, new buildings, and various matters relating thereto, from 1 June, 1772, to 1 June, 1778	525	8	0
By salaries and gratuities to the clerks of the committee, from Michaelmas, 1750, to Michaelmas, 1773	1,683	2	6
By ditto, to the chamberlain's clerks, for keeping the accounts from Michaelmas, 1766, to Christmas, 1777	693	15	0
By ditto, to the hall-keeper and his man, for summoning the committee, from Michaelmas, 1750, to Michaelmas, 1776	433	0	0

Incidental expenses	12,466	18	6
Interest paid on 144,000 <i>l.</i>	25,970	8	8
Purchase of ground and premises	35,584	1	11
Cash to Waterman's Company for the purchase of the Sunday ferry	42,250	17	6
Total	276,179	0	84

The specification and form of contract for London Bridge which are given, will be found valuable precedents.

The amount paid to Messrs. Jolliffe and Banks for this bridge was 425,081*l.* 9*s.* 2*d.*; but the whole sum expended on it including the approaches was 1,458,311*l.* 8*s.* 11*d.*

The chapter on timber roofs is a very valuable one (we should have been glad to find more information concerning iron roofs), and includes seventy illustrations, many of which are given for the first time.

The roof of the hall of Christ's Hospital, London, constructed by Mr. Shaw out of Baltic timber, possesses considerable strength; the walls, 3 feet 6 inches thick, are 15 feet apart in the clear; the rise of the roof in the centre, from the under side of the tie-beam to the top of the principals, is 9 feet 4 inches; it is queen-post trussed, and the tie-beams are held up at five different points, or at every 8 feet 6 inches; the principals are distant from each other 17 feet; the length of the hall is 187 feet and the breadth 51 feet; every precaution has here been taken to unite the feet of the principals with the ends of the tie-beam, and their weight at the ends is partly borne by iron standards, which rest on shoes worked into the wall below. The principals taper, and are 12 inches by 9 inches at the feet, and 9 inches by 9 inches at the top; the tie-beams are 14 inches by 14 inches; the straining piece between the heads of the queens 12 inches by 9 inches; the struts 6 inches by 6 inches; between each pair of principals is a pair of main rafters supported by five longitudinal trusses, and which are also made to carry the ceiling-joint. These longitudinal trusses bear upon the principal tie-beams, which are 17 feet apart from centre to centre; the middle longitudinal truss comes under the ridge, and is very strongly braced; the lower beam is 12 inches by 7 inches, the king-post 6 inches by 6 inches, and head 12 inches by 6 inches; the struts 6 inches by 6 inches; into the head of the kings are lodged the main rafters, which are 7 inches by 5 inches; on these are laid the common rafters longitudinally to receive the boarding, which is laid in the direction of the slope of the roof; so that the lead which covers it is

not so subject to derangement as when the boarding is laid the reverse way. The two other trusses on each side are similarly framed, the heights being varied to suit the top of the roof; that of the pairs on each side of the centre is 5 feet from under the side beam to the under side the main rafter; the outside pair are only 2 feet 9 inches in height from the same points."

ST. GEORGE'S HALL, LIVERPOOL.

Few architects get through a large building without difficulties and heart-burnings. Those of the architect of St. George's Hall seem to be approaching; the caprices of Dr. Reid, the wants of the musical professors, and the conflict of opinions in the Town Council, bid fair to produce a storm which may tax his temper and skill. Mr. S. Holme called the building a thing of shreds and patches, and found fault with the expensive manner in which the works had been carried on. Mr. Elmes characterised the statement as that of a dissatisfied contractor, and said that Mr. Holme's conduct, in availing himself of the knowledge he acquired as a contractor to make his attack in the council, was unprecedented as it was unjust; he added that his wishes had often been thwarted by the Messrs. Holme, who were suffering pecuniary losses by their contract.

At a recent meeting of the council, Mr. Holme said it was clear there must have been many alterations made, for the estimate had gone up from 90,000*l.* to 145,000*l.* The estimate given in April, 1841, was for 92,000*l.*; that was amended to 93,000*l.*; and the ventilation was to be 4,900*l.* Mr. Tomkinson contracted for the carcass of the building for 77,000*l.* In 1843, an addition of 28,000*l.* was made to the estimate. In October, 1843, an additional 1,000*l.* was demanded. Then came a demand of 5,977*l.* for stone instead of terracotta caps. Then in February 1844, a demand of 4,300*l.* was made for granite columns; but the cost of the columns exceeded that sum, and this showed that the building was erected in "shreds and patches." Then a demand of 5,000*l.* was made for alterations. In August, 1844, a new estimate was sent in for 145,000*l.* The time for executing the work, and the amount of the estimate, had both been doubled. He had never seen a number of flues turned into one flue without their being smoky. He thought the whole of the rooms on the east side of the building would be exceedingly dark, and that the rooms and passages on that side would have to be lighted with gas even in the day-time. The large room would also be dark. It came out, however, during the discussion, that some of Mr. Holme's work had been objected to, and that this had led to ill-feeling. It seems to us somewhat anomalous for the contractor to be, in another capacity, one of the architect's masters. It would not be just, however, for us to express an opinion on the subject with only half knowledge of the circumstances. At this moment, therefore, we simply chronicle the statements.

TO TEST SULPHATE OF AMMONIA.—Sir: I take the liberty of sending you the following simple mode of testing the purity of sulphate of ammonia. At this season of the year, when large quantities of this highly fertilising manure are being used, and when it is considered that it is sold adulterated to the extent of thirty, fifty, and even seventy per cent., I trust that you will consider this worthy of insertion in your valuable and widely-circulated paper. I am, Sir, &c., A. ANOTUS GRILL, Chemical Works, Bow-common, Middlesex.

Heat a shovell, or any plate of iron, in redness, and place upon it a portion of iron of sulphate of ammonia. If the salt be pure, the whole will go into vapour; if adulterated, the impurity will remain on the plate of iron.

NEW TERMINUS, LIVERPOOL.—The London and North-Western Railway Company is about to rebuild the main terminus at Liverpool, under the direction of Mr. Tite. Mr. John Jay, of London-wall, London, is the contractor for the works, at the amount of 36,000*l.* A great portion of the work is to be completed in a few months, and the whole within ten months from commencing.

The comprehensive 'public building' scheme at Sheffield, lately noticed in THE BUILDER, seems to have already led other towns to 'look out,' prospectively, for similar public accommodation on the great scale. Cambridge proposes to have not only her "assembly-rooms, reading-rooms, lecture-rooms, public offices," but her "post-office, excise-office, and other public institutions" comfortably grouped together in the same constellation, on the very site, too, of the townhall itself, which, it is presumed, will be also comprehended within the extensive area of so grand a scheme, if thus swallowed up and absorbed within the limits of its ample structural organism. The funds are to be raised on the joint-stock principle, to the amount of the necessary sum, namely, 11,000*l.* or 12,000*l.*, which will, it is expected, realize at least 4 per cent. to begin with, and eventually a larger return. Accommodation will be provided in the projected compound institution not only for mental food in reading-rooms, lecture-rooms, &c., but also for refreshment both of body and mind in rooms for restaurants, a tavern, &c. By the way, it is not Sheffield alone, but Nottingham, at least, along with it, that has had the merit and the spirit to take the initiative in this great structural movement.—The restoration of St. Nicholas' Church, at Yarmouth, is satisfactorily progressing, though the funds are quite inadequate. The gallery, which has so long occupied the whole nave, has been removed, and the north aisle is thus no longer separated from it. The body of the church is now said to have some grandeur of appearance, and the *tout ensemble* to be enhanced by the effect of the lancet window at the west end of the nave.

The state of two of the county bridges was lately brought under notice at the Suffolk sessions, held at Beccles. St. Olave's bridge, a doubtful property it seems in more senses than one, since no one knows whether it belongs to the county or to the Yarmouth Haven and Pier Commissioners, is in a very insecure and dangerous state, a part of the piers under water being entirely gone. East bridge, a wooden erection in Westleton parish, too, is broken down and must be rebuilt.—The fund for the erection of Pawnbrokers' Almshouses, at Stratford, Essex, has been realized to the extent of 3,000*l.*, and the ground has been purchased for a site.—A coloured drawing of a plan for the proposed esplanade at Ryde, the work of Mr. Thomas Hellyer, architect, has been exhibited of late at Ryde. It represents the esplanade three miles in extent—on a different and it is alleged an every way superior plan to that sought to be carried out by Act of Parliament.—The foundation stone of the new hospital at Portsmouth is to be laid by H. R. H. the Prince Consort.—The gas movement is pervading the choice little Isle of Wight like every where else. The inhabitants of Ventnor, in public meeting lately assembled, have been formally expressing their conviction, "that the introduction of gas would be a great public benefit, and tend to the further improvement of the town;" a "resolution" merely preliminary, it is to be hoped, to immediate measures of practical description.—The completion of the inner or floating dock at Southampton is likely, it is feared, to be postponed till next spring.—The new county prisons at Winchester are begun with the excavations for the foundations. The County Bridge-well is to be converted into materials for the new building.—The Aber-gavenny Charity Trustees have agreed to advance 500*l.* towards the erection of a school-room for poor children. Mr. F. H. Williams has kindly offered to give the stone necessary for the building, and the trustees are to pay 50*l.* a year towards the master's salary.—At a Liverpool select vestry, last week, when a report on the new workhouse was read, "Mr. Earle," according to the *Mail*, "said that a more abominable plan than that of the new buildings at the workhouse he had never known. Until Mr. Wightman had gone about to collect the details of his report, not a single requisite had been provided for the inmates. Think of one or two water-closets only for 400 or 500 people! In short there was nothing provided. All the money was spent on ornamental pinnacles. Rector Brooks said the Hon. Mr. Clements, the Assistant Poor Law Commissioner, might be said to be the princis