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INDEX.

AUTHORS' INDEX.

THE LANTERN RECORD.

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OCTOBER — NOVEMBER — DECEMBER — 1892.

CONTRIBUTORS.

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PARA-AMIDOPHENOL.

A new developer naturally takes some time to find its proper place in the estimation of photographers, for, whatever its intrinsic qualities, it is pretty certain to possess some peculiarities that have to be mastered before a real judgment can be arrived at as to its value. In the earlier days of gelatine plates there was a choice of two developers, each equally novel to the majority of photographers, who very largely gave their preference to the one which most resembled in its behaviour what they had been accustomed to with wet plates. Ferrous oxalate, being practically a "one-solution" developer, performing its task in a single operation, much in the same manner as the familiar solution of sulphate of iron and acetic acid, and moreover yielding an image much more of the wet-plate type, took the fancy of the old wet-plate worker sooner than alkaline pyro, with its more complicated method of working, simply because the latter required more learning; but, as the knowledge of how to use pyro increased, and the functions of the different constituents of the developer began to be understood, its superior capabilities were recognised, with the result that it soon displaced ferrous oxalate, except for positive work.

Hydroquinone, and subsequently eikonogen, next came into the field, and, after figuring as chemical novelties for a while, gradually became the subject of serious trial, giving rise to endless controversy as to their real value, and even at the present time neither can be truly said to have taken a fixed position. Though each of them may have numerous friends and admirers, it will scarcely be denied that pyro still remains the general favourite, and that in spite of drawbacks from which the younger rivals are free.

The newest addition to our list of developing agents, para-amidophenol, although it has been before the public now for some time, has not yet passed out of the novelty stage, and it will in all probability be long yet ere it secures any very general adoption. All the accounts of its behaviour have been, so far as we are aware, entirely favourable, and in many cases even enthusiastic; but this is generally the case, for the experimentalist is prone to go into raptures over any new thing that proves tolerably successful at the outset without waiting to discover its shortcomings, or measure it comparatively with pre-existing methods.

In saying this we do not for a moment intend to decry the new agent, nor to suggest that its praises have been over-sung. On the contrary, we are bound to confess that para-amidophenol starts with a better record than either of its immediate predecessors, so far as the quality of its results and its general adaptability are concerned. But the question to be decided (and that can only come with time) is, does it offer any real advantage over pyro, hydroquinone, and eikonogen? Its sponsors claim it to be the most powerful developer extant, which possibly it may be, and yet without satisfying every requirement; but, at any rate, there must be reckoned on the other side of the account its insolubility, which forms a serious hindrance to its general adoption.

We have purposely deferred expressing any definite opinion on the new agent, samples of which were sent to us some time ago by Messrs. Becker & Co., until we had had opportunities of giving it a pretty extended trial, and, though even now we can scarcely consider ourselves in a position to arrive at a decisive judgment, we can at least indicate some of the most noticeable features in its character.

Without going into ecstasies on the matter, we may at once say that first impressions of para-amidophenol are decidedly favourable, so far, at least, as its developing action is concerned. It is rapid in its action, clean in working, gives an image of excellent quality, and seems to be peculiarly elastic in its capabilities, though precisely the same may be said of pyro, and perhaps of other developers.

But the first drawback is found in its comparative insolubility, which renders it almost, if not absolutely, compulsory that it be employed as a one-solution developer, as, without the alkali, it is practically impossible to get sufficient dissolved to form a useful stock solution. There is, perhaps, no reason why we should object to a developer which is complete in a single solution if it does its work as well as another; but it is difficult to believe that, under such circumstances, there is as much control over the action, as it progresses, as when, by the addition of alkali or restrainer, deficiencies or errors in the exposure may be rectified so soon as they become apparent.

It is true that in the old wet-plate days the developer was a single solution, and exposures had to be toned with something approaching accuracy, in order to ensure success, and possibly the general quality of the work turned out was none the worse for that; but, under the new *régime* of dry plates, the system of "rational development," as it has been called, *i.e.*, the modification of the developer to suit the image as it progresses has always found greater favour than the application of a complete solution, whether mixed at the moment or kept in stock. Even with ferrous oxalate, originally a one-solution developer pure and simple, the practice of modifying the solution as the plate seemed to require it gradually crept in, and, so long as our sensitive films continue to possess the latitude that permits this patching up of a wrong exposure, so long will the so-called rational development be resorted to.

For a single solution developer para-amidophenol behaves remarkably well. It keeps well, remaining colourless for a very long period; some that we prepared upwards of three months ago is apparently unchanged, and so far as we can judge retains its energy intact. Its developing action is rapid and

the case, varnishing would be a very great improvement, a benzol varnish, used without heat, may be applied with safety and advantage, the plate being first dusted with scrupulous care. A singular point may here be mentioned: a reversed picture — that is, one in which the right hand appears to be the left, and so on—is never satisfactory; hence all the requests to make the picture "face the other way about" must be met with a refusal, otherwise the copy will be a failure. This remark applies to all kinds of photographs. But the difficulty about glass pictures is that they usually are reversed, the film side being generally that exposed to view. Our advice here is not to bring the picture back to nature (which may be done by copying from the back, if it be upon clear, colourless glass), unless it be a very recent one, for the eye has become accustomed to the aspect of the glass picture, and a reversal will disappoint. We could add very much upon this aspect of portraiture, but must not here do so, to avoid making our articles wanting in conciseness. We must again say that the best results in copying these photographs are obtained by wet collodion, though careful attention to exposure and development will enable very good results to be produced by dry plates.

In fixing up the picture for copying, the same care is needed to obviate reflections that we have indicated with Daguerreotypes, especially as regards the front of the camera; but a more all-round light may be used. Those who have not copied glass pictures will be astonished at the plucky, vigorous negatives obtainable even when the enlargement is to several diameters.

From the ninth *Annual Report of the Committee on Indexing Chemical Literature* we find one bibliography which would be most useful to photographers. It is entitled *A Bibliography of the Chemical Influence of Light*, by Alfred Tuckerman. It is in the Smithsonian Miscellaneous Collection, numbered 785, published at Washington, in 1891, and consists of twenty-two pages 8vo. Great interest is aroused in the chemical world by recent investigations upon a newly discovered gaseous compound of iron. Finely divided iron is heated in a stream of carbonic oxide, the product, after a long operation, being the new compound we speak of, which is termed ferro-penta-carbonyl. It is a light amber-coloured liquid, which may be distilled without decomposition, and has a specific gravity of 1·44. Its interest to photographers lies in the fact that it is sensitive to light. Kept in the dark it is perfectly stable, but when exposed to light an important change takes place, gold-coloured crystals rapidly form in it, which, upon analysis, are found to consist of a second iron carbonyl. They are insoluble in ordinary solvents but when heated to 80° C. they decompose.

One of the latest uses of chloride of gold, but which we yet think is not likely to enhance its value to photographers, is an extremely remarkable one, being no less than as a cure for dipsomania!

Most scientific photographers are aware of the difficulty of obtaining a trustworthy standard of light for comparative experiments, We described, at the time it was first adopted by a scientific committee, the melting platinum standard, which is quite impracticable for photographic use. Then we have Mr. Vernon Harcourt's pentane lamp, and lastly the authorised standard of the Board of Trade—the "standard candle." For a long time past it has been seen that the latter is open to serious objection, in that it is far from a constant illuminant, quite apart from the statement, which we believe to be correct, that special candles are made, which, apparently legal, are so made as to give indications favourable to the gas-manufacturers. Such a condition of affairs has led the Board to appoint a committee to consider what the standard light for testing the gas supply of London should be. The South London Gas Company, of which Mr. G. Livesey is Chairman, have undertaken to pay the whole of the expenses, and the committee will shortly be formed. It will consist of two members of the County Council, one appointed by the City Corporation, three by the London Gas Company, together with three gas referees and two independent scientific men. Dr. E. Frankland, F.R.S., and Mr. Dibdin, the Council's chemist, will represent the London County Council. Pending the report of this Committee, the Council has deferred action in the direction of obtaining legislation for a more exact standard of light.

It is quite evident that, if a practicable and reliable standard can be devised, it will be of considerable value to photographers; for, although it goes without saying that a light standard is not necessarily a standard of actinism, its advent will be hailed with satisfaction, if only on the principle of half a loaf being better than no bread.

Writing on this topic, a correspondent suggests to us the advisability of designing a suitable burner for burning the ordinary ether of commerce, which can be obtained practically pure at a cost which would be merely nominal.

Mr. W. T. Suffolk writes to the *Chemical News* on the subject of the new methylated spirit, and makes a suggestion of a very practical nature, in which we are sure many photographers and photographic manufacturers will heartily join. "By the new order," says Mr. Suffolk, "histologists are deprived of their most valuable reagent. Alcohol in histology, like sulphuric acid in chemistry, is the key to most of the work, and a heavy duty on either would bring work to a standstill. Among the societies whose members are affected, besides the Royal Microscopical, are the Chemical, Photographic, Linnean, Zoological, &c. Hospitals, large museums, and medical schools are able to obtain quantities of five gallons and upwards of the old kind of spirit; but small laboratories, and the whole race of amateurs must either leave off work or pay the duty of ten shillings and sixpence per gallon. Truly 'endowment of research' with a vengeance."

Mr. Suffolk brought the matter before the Council of the Royal Microscopical Society, and that Society rightly considered that other societies might take united action in the matter, and bring pressure to bear upon the Inland Revenue. We should hope, with Mr. Suffolk, that this body is ignorant of the mischief it is doing. So far, no photographic society has moved in the matter of a protest, but Mr. Suffolk's invitation will surely not go unheeded. Some weeks ago it was mentioned at a meeting of the London and Provincial, but no action was taken. With so much energy at command at 50, Great Russell-street, we suggest that this is a fitting opportunity for the Photographic Society of Great Britain to approach the Somerset House authorities.

Now that the subject is engaging popular attention, it is reasonable to expect that a decided impetus will be given to the provision of other agents for altering the tones of bromide prints besides uranium. Mr. A. Haddon is already in the field with some experiments in this direction. He has just allowed us to inspect a bromide print having a far from disagreeable brown colour, which he informs us was produced by treating the picture with a solution of a salt of copper alone. When some necessary further experiments in the improvement of the method are completed, Mr. Haddon will probably enlighten us as to the identity of the particular salt which has the valuable property of reacting with metallic silver, thus improving the tones of developed bromide prints.

A reversing eyepiece for the stereoscope has been patented by Mr. Birt Acres. The eye-tube is necessarily somewhat longer than is usual in oculars for the stereoscope, because it has to contain four lenses, each separated from the other by a certain space. The advantage of such eyepieces is in its being possible to print a transparency by superposition from the uncut negative, and then to examine it in a stereoscope thus fitted, the effect of solidity being given. This was done long years ago by means of reversing prisms, but Mr. Acres' method is distinctly different.

Our sprightly morning contemporary, the *Daily Chronicle*, recently treated its readers to a lengthy and solemn review of Mr. W. E. Woodbury's book on the gelatino-chloride-of-silver printing process, which, however, was less of a review of the book than a critical examination, more or less trustworthy, of the process itself, and the various commercial brands of paper on sale. We congratulate Mr. Blackie and the Blackfriars Photographic Company upon the laudatory notice which celerotype is fortunate enough to obtain from such an impartial authority. But we are curious to learn the reason of our contemporary's dismissal of the Ilford printing-out paper in the damnation-with-faint-praise vein which the writer thinks fit to adopt. Aside of these peculiarities, the *Chronicle* review contains a great deal of information which will be new, if not instructive, to photographers, and on that ground, to quote the old phrase, it is well worthy of perusal. It is also maladroitly humorous, which, for the reputation of the *Chronicle*, we sincerely trust is attributable to the festiveness of the season, and nothing more. As our readers will see from the letters in another part of the Journal, the Britannia Works Company are unable to enter into a kind of humour of which they are the innocent victims, and they have properly entered a protest against some of our contemporary's remarks.

Mr. Frank Hars was kind enough recently to exhibit to us a photographic relic of possibly the highest historical interest. This was a document in the handwriting of Daguerre, giving instructions for the working of the process with which his name will be for ever identified. The document is neither signed nor dated, although there is evidence in existence to show that it is probably a genuine production of Daguerre's, from whom it was said to have been received by Mr. L. Loewe, private secretary to the late Sir Moses Montefiore, in the year 1840. If any one has a letter written and signed by Daguerre, Mr. Hars would be glad of a photograph of it, in order that the writing might be compared with that of the document referred to.

AMERICAN NOTES AND NEWS.

From a notice in the *Photographic Times* we gather that the *American Annual* for 1892 is published. Although we have not yet seen it, the goodly array of names of contributors given leaves no doubt for believing it will prove an excellent number.

We learn that a lens with a twenty-four-inch aperture, and focal length of eleven feet, is to be fitted to the photo-telescope for Harvard University now being made by Alvan Clark, & Sons. It is said that it will be the finest instrument of its kind ever constructed.

The death of a well-known Canadian photographer (Mr. William Notman, of Montreal) is announced as having taken place on November 25. Mr. Notman was a Scotchman, having been born in Paisley in 1826. In 1856 he went to Montreal, where he entered into the "dry-goods" business, but soon gave it up in favour of photography, in which he had been an amateur previous to leaving Scotland. He soon acquired great distinction. Branch businesses were established in Boston, Halifax (N.S.), and New York under the management of his sons. He was much respected wherever known.

Not only to many of his own compatriots, but to not a few self-styled inventors on this side of the Atlantic, do we commend for imitation a most refreshing piece of honesty which saw the light a little while ago at a meeting of the Photographic Society of Philadelphia. Here is its record: "Mr. James Wilson exhibited a new shutter for instantaneous or time work. It was copied from an English invention, known as the Sargent shutter." Honour to thee, Mr. James Wilson, for that acknowledgment; but how, pray, can a "copied" shutter be "new?" Never mind. You own that it was copied, and you deserve a decoration for the admission. "*O, si sic omnes!*"

Mr. A. H. Calderwood, in *Anthony's Bulletin*, recommends the following method of stripping negatives for reversing:—Coat with rubber turning solution (para gum dissolved in benzole to the thickness of collodion) and allow to set, which is shown by the disappearance of the glossy surface. Next coat with a thin, plain collodion, which will set immediately. Run a sharp-pointed instrument round the film to the depth of an inch, and place the plate in a tray containing a solution of acetic acid in water 1 : 5. When the film is loosened, the stripping and reversing is done in the usual manner. By the way, would not such a strong solution of acetic acid have some considerable solvent effect on the gelatine?

In an article in the *Photographic Times* Mr. W. Jerome Harrison says that the first notice he has been able to find of the commonly adopted process of intensifying by bleaching with mercury followed by ammonia is contained in Hunt's *Manual of Photography* of 1853. On referring to Scott Archer's *Manual of the Collodion Process*, published in March 1852, we find detailed directions given for whitening the image by mercury, after which he adds: "After this bleaching it can be changed into a deep-toned negative many shades darker than it was originally, by immersing it, after a thorough washing, in a weak solution of hyposulphite of soda, or a *weak solution of ammonia*. The white picture will vanish, and a black negative will be the result." This establishes the priority of Archer over Hunt.

Some months ago we wrote in favourable terms of some bromide prints with most charming sepia tones by Messrs. Inglis & Co., of Chicago. Mr. Inglis was recently present at a meeting of a New York photographic society, where the subject of uranium-toned bromide prints was under discussion, and said his company's process differed in every feature from the uranium toning method. The basis of the tone, in fact, on their papers was within the preparation of the paper, and a patent had been applied for. We suppose that what is meant is that the toning basis is in the emulsion with which the paper is coated. Such a process of toning, as we pointed out in a leading article a short time since, would be very welcome. The tones of Mr. Inglis's prints are equal to any of those produced by the uranium bath, which is high praise.

The movement for organizing a Photographic Assistants' Union in this country unfortunately never came to a head, although there was a universal agreement that such a Union was not only practicable, but desirable. In New York the assistants are forming a Union for the purpose of securing redress for the numerous grievances of which they complain. These are headed by "miserable wages." More than this, they assert that they are scorched on the roofs in summer while looking after the printing, and frozen in the winter. All the blame for bad work is shifted on their shoulders by the employers. They also allege that they have to compete with a lot of young men who are not adapted for the business, and, by accepting low wages, keep down the standard of wages all round. We wish the Union every success. Some of the New York grievances are not unknown in this country, and the pity of it is that they are at present practically irremediable.

The establishment of another monthly Canadian photographic journal is announced. There is already one largely devoted to the interests of photographers in the Dominion, the *St. Louis and Canadian Photographer*, the publisher and proprietress of which (Mrs. Fitzgibbon-Clark) must be congratulated upon the energetic manner in which her journal is conducted. *Apropos* of the Maddox Testimonial, now being raised both in this country and America, the *St. Louis and Canadian* makes a strong and generous appeal on behalf of one of its own countrymen, Professor H. H. Snelling, who is one of the fathers of photography in America, but who is now aged, blind, infirm, and in destitute circumstances. Let us hope that such a response will at once be made as will place him, not only beyond want, but in comfortable circumstances. It is not to the credit of America that one like Professor Snelling should be allowed to remain in want of the necessaries of life.

LANTERN SLIDES BY THE CARBON PROCESS.

The carbon process for lantern slides possesses several advantages over those of any other. For example, it is easy in practice, the pictures can be produced in any colour, and certain parts can be dodged by local treatment in the development; also, the tones of the slide can be modified after it is finished. For these and other reasons the process is one that should especially commend itself to the amateur and others desirous of obtaining variety in effects.

The practice of the carbon process has been much simplified since the Autotype Company and other manufacturers have supplied the paper in small quantities sensitised and ready for use. Not only is the trouble of sensitising avoided, but the tissue is secured in the best condition for work. It is now tolerably well known to most of our readers that, in carbon printing, one of the most important points is that of sensitising and drying the tissue, and when this is accomplished satisfactorily the whole of the after-operations are simplicity itself. Most amateurs who go in for carbon lantern slides will, we surmise, prefer to purchase the tissue ready for printing; however, this article would not be complete without instructions for sensitising it at home.

With regard to the choice of the tissue for lantern slides, this is quite a matter of taste. There are several shades of brown and purple in the market, as well as red, sepia, and other colours, all of which are suitable for lantern slides. A special tissue is made for transparencies, the colouring matter of which, we believe, is China ink, which yields an excellent black picture. In this tissue the pigment is said to be in a fine state of division, and in greater quantity than in any of the others. Still, as we have said, any ordinary tissue may be used with good result; indeed, in some cases, as will be explained further on, a tissue highly charged with pigment is not desirable.

There are different methods of procedure in sensitising carbon tissue. Some simply immerse it in the bath, take it out, and then hang it up to dry. Some, after taking it from the solution, place it on a glass plate and pass a squeegee over the back before suspending it to dry. Others, after the tissue is removed from the solution, squeegee it upon a collodionised glass, and allow it to dry *in situ*, and remove it afterwards. When either of the latter plans are adopted, the bath should be used a little stronger than in the case of the first, inasmuch as there is no superfluous solution left on the surface to afterwards soak into the tissue.

For lantern-slide making, a suitable sensitising bath, for this season of the year, is one of three ounces of bichromate of potash dissolved in three pints of water, to which is added a drachm of strong liquor ammoniæ. The bath should be made up a day or so before use, then the upper portion can be decanted from any sediment, and thus dispense with filtration. It may be used many times, but should be discarded as soon as it acquires a decided brown colour. The solution is poured into a dish to the depth of half an inch at least. In this, after being carefully dusted, the tissue is immersed, all air-bubbles, of course, being removed until it becomes quite flaccid, which it will do in from two to three minutes, according to the temperature of the solution. It is then taken out and placed, face downwards, on a glass plate, and a squeegee passed lightly over the back to remove the superfluous liquid, and then hung up to dry spontaneously in a room free from the fumes of burning gas or other noxious vapours. For suspending the tissue, there is nothing better than letter-clips. Those known as the "Bulldog Clips" are the best for the purpose, as the jaws of them cover a space of two and half or three inches, and thus secure a firm hold on the wet paper. The drying should be effected in from six to nine hours, otherwise there will be a danger of the tissue becoming insoluble. It should not be allowed to become over-dry, that is, crisp, or its sensitiveness will be impaired, also there will be a difficulty in obtaining perfect contact with the negative in the printing frame.

The above method answers very well for ordinary work, but for lantern slides the following one should be employed. Take some glass plates, say, twelve inches square, as that size will suit sheets of tissue, from which nine lantern-size pieces can be cut. Prepare the surface by rubbing it over with French chalk, and then coat it with plain collodion. Commercial enamel collodion will answer. After the collodion has well set, place the plates in water until all greasiness is removed; or the ether and alcohol may be washed out under the tap. The glasses are then well drained, and the tissue, after it is taken from the bichromate solution, is squeegeed, face downward, on to the collodionised surface, a piece of indiarubber cloth being used to prevent injury to the film, and allowed to dry on the glass. This system of sensitising and drying possesses several advantages for lantern-slide making. The surface of the tissue is protected from dust. It is not exposed to the atmosphere while drying, which, if it contains any injurious vapour, would tend to cause a degradation of the light when the picture is developed. The surface, when stripped from the glass, is perfectly even, so that the best contact with the negative is secured. Further, an otherwise after-operation is saved. The tissue may be sensitised in the light of an ordinary room, as, while it is wet, it is practically insensitive.

When the tissue is dry, it must be preserved from the air, either by keeping it in a metal case, or under pressure between glass plates. If it be dried on the collodionised glass, it is best preserved by keeping it on the plate, and only stripping it off when required for use, the plates being packed together, tissue to tissue. When tissue is dried under the conditions named, it will keep in good working order for from one to three or four weeks, according to the time occupied in the drying and the care with which it is kept.

The pictures may be developed on plain glass, or on a substratum of collodion. But, as gelatine is a highly contractile substance when subjected to heat, it is advisable, in the case of lantern slides, to have a very tenacious substratum, such as one of insoluble gelatine. This forms a good one: Nelson's "No. 1" photographic gelatine, an ounce dissolved in a pint of water. To this sufficient bichromate of potash is added to just give a pale lemon colour. The plates, after being thoroughly cleaned, are coated with the solution and allowed to dry in a good light. The light renders the coating insoluble. Theoretically, plates so treated should have a slightly yellow tint, but practically they have not when finished. However, here is another formula that will yield a substratum free from any suspicion of colour: Gelatine, as before, one ounce; water a pint; when dissolved, add twenty grains of chrome alum in one ounce of warm water. Plates prepared according to either formula will keep for many months if kept dry. Therefore a good stock may be made at a time.

We have treated the sensitising of the tissue in detail, although we assume that the majority of amateurs would prefer to purchase it ready sensitised, and thus avoid the trouble of doing it themselves. We shall now proceed to the printing. In the first first place it is necessary to protect the edges of the tissue from the action of light while it is being exposed; otherwise, when the picture is developed, it will frill at the margins. The most convenient way of providing a "safe edge" as it is termed, in the case of lantern pictures, is to place on the negative a lantern-slide mask, with an opening the same size as, or preferably a little larger than, the finished picture is required.

The tissue, cut a trifle smaller than the glass plates, is placed on the masked negative and exposed to light, the same as in silver printing; but, as the image will not be visible when printed, the exposure should be judged by an actinometer, of which there are several forms in the market. Or a negative may be selected of the same density as those to be printed from, and that, with a piece of albumen paper upon it, used as a guide for exposure. With regard to this, it may be mentioned that it is governed very much by the quality of the light at the time of printing.

Carbon tissue of normal sensitiveness, if printed in a strong light, requires but about half the time of silver paper; whereas, if it be printed in a feeble light, quite as long an exposure will be necessary. For transparencies a much longer exposure is necessary than what would be required for carbon pictures on paper—double, at least. As considerable latitude is allowable, it is better to err on the side of over rather than under-exposure, as there is great scope for remedying it in the development. As will be explained presently, what might be termed over-exposure is a positive advantage in some instances. It may be explained that carbon tissue becomes more sensitive by keeping; therefore, that which has been kept for a week or two will require less exposure than that just sensitised—in some cases not more than half. If the tissue has to be kept many hours between exposure and development, allowance must be made in the exposure. It is now pretty generally understood by the majority of our readers that

the action of light on carbon tissue, once started, goes on in the dark; consequently, if the image is not to be developed as soon as printed, the exposure must be curtailed according to the state of the atmosphere. Heat and damp accelerate the action, while cold and dryness act as a retarder.

The tissue being exposed, we now proceed to the development of the image. For this a deep zinc or tin tray is usually employed; but, of course, any other vessel will answer quite as well. If the tissue in sensitising was not squeegeed on collodionised glass, it should now be coated with collodion. This is easily done by pinning it by three of its corners to a small piece of thin board—such as a piece of cigar box—and then pouring the collodion on and off at the free corner, as in coating a glass plate. The collodionising may be dispensed with; but, as it possesses several advantages, and involves so little trouble, it should always be adopted, particularly when it is desired to modify the tone of the picture after it is finished. The collodion being dry, the next operation is to mount the tissue on the glass.

The plates, prepared as described in the former article, are placed in a dish of clean cold water. A piece of the exposed tissue is then immersed until it becomes slightly limp, but not so limp as is usual when working on paper. It is then placed, while still in the water, on one of the plates, so as to avoid air bubbles, removed, laid on a flat surface, and then well squeegeed down. A sheet of macintosh cloth may be used to protect the back of the paper, but, with plates prepared as directed, it is scarcely necessary. If, however, the glass be coated with collodion instead of insoluble gelatine, as is sometimes done, then the macintosh is essential to protect that film from injury. The prints, as they are mounted on the plates, are piled one upon another, with a piece or two of blotting-paper between each, with a weight upon the top one. The whole is then allowed to remain for ten minutes or so, and they are then ready for developing.

To develop, the plates are placed, tissue upwards, in a dish or tray of warm water, temperature 90° to 100° Fahr. In a few minutes the colour will begin to exude from the edges of the paper, which should then be stripped away, and the development allowed to proceed. This will be assisted by laying the water over the surface with the hand. The development is complete when the whole of the pigmented gelatine unacted upon by light is washed away, and the highest lights show without veil, when the picture is laid on white paper. This, if the picture was lightly printed, and the tissue freshly sensitised, will occupy but a few minutes; but, if it has been darkly printed, as it should be, it will take ten or fifteen minutes, or even longer. When this is the case, it will be found more convenient, when the major portion of the gelatine has dissolved, to transfer the pictures to clean water at a higher temperature, say, from 100° to 110° Fahr., as they can then be the better seen.

At one time grooved developing tanks, such as those used for the development of Woodbury reliefs, were sold. But it is obvious to any one that, if the plates are placed in an ordinary washing and draining rack, and that is suspended in a vessel of warm water, say, a large tin saucepan, over a small gas-jet, it will answer every requirement when a prolonged development is necessary. Indeed, for lantern slides such an extemporary arrangement will be found more convenient than a tank with fixed grooves. Should the pictures prove very much over-printed, they need rarely be lost, as it is simply a question of time and temperature in the development. In such cases, the heat of the water may be increased to 120° to 130°, and the time prolonged until they are sufficiently reduced.

It may be well to point out here why the advisability of deep printing has been so strongly emphasised. A darkly printed transparency, forced in the development, is always more brilliant than one that is lightly printed and quickly developed. Again, if the tissue has been kept for a long time, or it was dried under adverse conditions, the picture will often prove fogged or veiled in the lights when developed. This veil, however, will be dissolved away with a prolonged development, though it would not with a brief one. Furthermore, deeply printed slides, reduced in developing, do not require treatment with alum, which, by the way, is no improvement to the picture. If, however, the slides are lightly printed in the first instance, they must be immersed for a few minutes in a five-per-cent. alum solution, and then well washed to remove the excess of alum from the film. The reason for this is that, with weak printing, the gelatine in the lighter portions of the picture is still soluble, if sufficient heat be applied in the presence of moisture. This latter, as many are aware, sometimes finds its way between the two glasses; hence the heat of the lantern, but for the aluming, might cause the film to run. When the development of the image is completed, the plate is well rinsed under the tap, and the transparency put away, to dry, where it will be free from dust.

It may be pointed out, for the benefit of novices, that, from the time the printed tissue is placed in the cold water, prior to mounting it on the glass, all the operations may be conducted in broad daylight.

A QUIET NOOK ON THE NORFOLK COAST.

It is presumed that photographers, both amateurs and professionals, are human flesh and bones as other folk, and as the summer comes, with its regular march, accompanied often by irregular weather, they both think with a sigh it is time to rest their weary minds and wish for a change for themselves and their little group. Then comes where to go.

In advising a holiday haunt there exists some difficulty in the different opinions and tastes how to spend a holiday. The quiet man would shun a destination thoroughly suitable to a party of merry single young chappies on fun and frolic bent; still, as it's impossible for one drug to cure all and every complaint, it only remains for yourself, as the ever-wise dispenser, to select and mix in quantities and proportions such as you deem most suitable for general purposes. I, as a young man, with wife and juvenile family of three souls, have found always everything to meet our requirements on the Norfolk coast. We frequent a little place known as Maundsley, situated between Cromer and Yarmouth. Although we don't stay at Maundsley Proper, there can be found nice, clean little cottages at very reasonable figures for a little family there. It is a fishing village; it is quiet and very quaint; so quiet, indeed, that hardly ever more than a dozen people are to be seen on the beach at one time, and no stalls, niggers and hawkers, more or less frequent with other seaside resorts, are to be found. Now, to a man not receiving the salary of a prime minister or prize-fighter, the question of railway fares will, do what you may, present itself strongly, more or less, according to the distance. In this respect the Great Eastern are indeed generous to the public, and also not too particular as to whether a child *is* or *is not* three years by a few seconds; or the eldest *has* or *has not* just struck twelve. I have seen young people go on long rides with a half-ticket that anywhere but on a rail car would no doubt feel highly offended did you consider them so young in years; still, as before mentioned, in the particulars of ages they are not severe, and no doubt are in the long run gainers by not so being, as, did they roam among their passengers with the eagle eye, many and many families that now get once a year the bracing sea air would by compulsion stay near at home, and the company lose such traffic as they now get; therefore the public admit of their generous spirit, and give them all the business they can. This is a digression; still, to many, this information may be especially interesting.

The two nearest stations are North Walsham or Gunton, from the first there runs a bus landing you right to the destination. The return fares are 15*s*. for a fortnight, 10*s*. Friday till Tuesday. The distance is 134 miles, and there are fast trains.

We locate ourselves with friends at a farmhouse hard by, and our days are generally passed by early rising, the little ones liking to fetch from the henhouse eggs for breakfast. Then comes the packing basket with eatables for dinner or lunch, then all is ready for our conveyance. It must at once be known, in Norfolk the much-abused donkey—or "Dickey," as they call him—is in great request, and, with a nice, smart village cart tagged to him, there is something much worse to be had, although many may think differently; still, such is my experience. We then add a large-size umbrella tent, and away we go.

Reaching our destination within two miles, the little vehicle is put up at the "Life-boat," and a short incline leads on the beach—a beach of the softest sands, and miles in distance both to the right and left. We pitch our tent, get the youngsters ready for wading, and the fun commences. We can use the tent for many purposes. The tide may be ready, and I visit the Coastguards, and borrow, for a few coppers, a full-size shrimping net, a rough, old, tattered-and-torn suit, consisting only of an old blue pair of trousers cut to the shortness of knickerbockers. Back to the tent, soon reappearing *à la* Robinson Crusoe, and so beautifully disguised that your nearest friend all but fails to recognise you in your altered condition. With your net-pole across your shoulder, you push out to the desired depth, net in front, every little while coming back to a dry sand-bank, and throw out your catch of small fry and hopping shrimps, to the immense delight of the little ones waiting to snatch them up, half timid, and drop into the large basket brought to take home the day's sport; and so you push on until the return of the tide closes your labour. Two of us have frequently taken home a bushel of splendid shrimps, had them cooked, and served hot for tea. On a beach of this kind there are no restrictions, and no dangerous breakwaters to the danger of the children. Ladies can as easily bathe as the men. Many erect a tent, and leave it standing the term through.

After some hours of this we all return to a jolly Norfolk meat tea, where everything the house possesses is placed on the table. The children are sent to bed, near friends call in, and the evening soon passes in music, and song and mirth ending a fairly representative day of many.

From North Walsham and Gunton you can easily reach by cheap excursion train many well-known places, as Cromer or Yarmouth, while I find many wonderful pleasant days in company with rod and line. A 1*s.* 6*d.* ticket gives you a return fare to Wroxham Broads, a most beautiful stretch of water, from which can be taken a good load of fish. All these rivers and broads are wild and wonderful. Again, the lanes in Norfolk are very pretty indeed, abounding as they do with an ever variety and multitude of wild flowers and strawberries, while the ferns are in profusion for species and quantity. A road trip to Gunton Park is one worth doing, and one to recollect. About here is simply alive with game of all kinds.

Norfolk people are homely and kind. They are clean and reasonable in their charges. I have had a good bed and eggs and ham breakfast before now, the whole costing less than 2*s.* Going back to Maundsley, you can find superior classes of houses if you desire, and you have a telegraph office, post office, provision merchant, boot dealer, in fact dealer in general, all done in one little shop, with a low door that you must bob to get in. To those who wish quietude and no restraint, by all means give this haunt a trial. The Great Eastern Railway issues free a little pamphlet entitled *Farmhouses and Lodgings*, which every one should possess before deciding.

T. Coan.

OUTDOOR PHOTOGRAPHY.

I.—Introductory.

The principal object of this short series of articles is to endeavour to afford some assistance to young members of our craft whose fate or inclination it is to have to earn a living as an outdoor operator. As the writer is fully aware of the disappointments and difficulties in the way of success, he will try, in as practical a manner as possible, to communicate his experience. It will possibly be old news to old hands who are well acquainted with the abundant literature of the subject which has been published in the past, but which, nevertheless, is only accessible to very few who have entered the ranks at a later period. The desire to provide for the latter class must be the excuse for reiterating what, perhaps, has been written again and again.

The practice of outdoor photography as one of these, is a very different thing to skimming the country with a hand camera for pleasure, under no compulsion to put forth effort to produce anything good, or to go beyond mere plate spoiling, the thing most to be wondered at in such proceedings being that so many can be found to take so much trouble to prepare plates for the sink when it can be done with much greater ease at home by simply opening a parcel of them in daylight. One fair result per hundred of plates used would scarcely satisfy a first-class employer, even if it proved a model picture; sixty to seventy per cent. for all-round work is more like what is expected, and these obtained under all conditions of weather and mood of the man. Many of the writers and speakers who profess to know so much of the matter are entirely ignorant of the routine of photography as a business, and I venture to say that if they were placed for twelve months in a good house their general estimate and ideas of the possibilities of photography would undergo a great change. It would be a thorough clipping of wings. To take orders over-night, or perhaps with only an hour or two's notice, for all kinds of photography—including landscape, group, cattle, outdoor portraits, shipping, &c.—and do the work at the time appointed, is something different to contemplating a scene for a twelvemonth and taking it a few dozen times before anything worth printing is obtained, and that possibly coming decent through no fault of the man. Understand, the writer has no wish to decry the spirit of thorough painstaking and desire to put character into one's work. It is worthy of all praise, and, provided extra carefulness does not interfere too much with the number of negatives produced in the day's work, will be appreciated by employers and paid for accordingly. To be uniformly successful in photography, a thorough training under such influences is necessary. Skill and resource and cultivated judgment only come from long practical experience, and are neither bought with a dozen quarters or a guinea set. Fortunate is the aspirant who has had the privilege of receiving a few years' preliminary training under such circumstances; then he may feel some confidence that, when the time comes for him to take sole charge of the outdoor branch, he will not be at fault in dealing with work not unusual in character. If, in addition to this, he be a lover of good order, and take a delight in keeping things nice, he will be an acquisition to any establishment, and his value soon become known.

When entering upon a fresh engagement, it is a good plan to have an understanding as to the apparatus set apart for outdoor work, to note well its kind, and carefully examine it as to its fitness for the purpose; to have any small repairs attended to, and make suggestions as to what is desirable to add to the "kit." Some ask permission to take charge of it, and find some nook where it may be placed and kept in readiness for immediate use. An endeavour must then be made to impress upon others in the firm the necessity of asking permission to use any article, and of returning the same to its place in good condition as soon after it is done with as possible. Should there be a slovenly man about, the wisdom of this course will soon appear. The necessaries for various kinds of work should be tabulated, and lists of contents or belongings pasted into cases or other receptacles used for packing the traps. A system of this kind abolishes half the "wear and tear" of getting away to a job, and leaves the operator free to think over the details of the most important part of his duties—that of making the photographs. Let no pains be spared, go completely equipped, intent upon doing the best that can be done, with means for developing a plate, or the whole of the work, on the spot if it be of an uncommon or uncertain kind. With this extra trouble the business is light compared with what was absolutely necessary when wet collodion was in vogue. The preparation and paraphernalia necessary for successfully working this process would astonish modern men. Six months' practice of it by each would-be photographer would go far towards extinguishing the craze for the saving of trouble, and the sacrificing of the most desirable qualities in apparatus that the outfit may be a few ounces lighter, and have the effect of thinning the ranks to the advantage of men of more solid cast who are unaffected by considerations of this nature.

After the work is done the list must be run through to see that everything is present before quitting the ground, and on arriving at home, especially if the weather has been damp, the camera and slides should be opened out and placed neatly together till there is leisure to look them over and place them ready for another jaunt. Any peculiarity worthy of note or to be guarded against in using any part ought to be jotted down, and some definite mark made in the list against it; then, whatever time elapse before it is required again, the preliminary scanning of the list will warn the operator and prevent his being taken in a second time. Strict attention to such small matters saves much vexation and disappointment, as it often happens that an otherwise good negative is spoiled by some trifling defect from a cause that the slightest inspection or a moment's thought would have detected.

For the benefit of those who have the privilege of being able to order what they require, instead of taking to and making the best of things as they find them, the writer will endeavour in another article to show how to make a selection and distinguish between mere fads of construction and really useful contrivances likely to stand our splendid climate. Every old hand knows quite well that a piece of apparatus is one thing in the warm and dry atmosphere of a dealer's show-room, and quite another after use outside.

John Harmer.

REVERSAL.

[A Paper read before the Camera Club, and printed in its Journal.]

In opening the subject of reversal this evening, it would be well to understand that a reversal negative and a reversed negative are different things, a reversal negative being the result of what has been termed reversing action; it is produced direct from a negative, and is reversed as regards right and left. A reversed negative is reversed as regards right and left, but is produced from a positive.

We all know that over-exposure produces flatness owing to the difficulty of obtaining density in the high lights; it is easy to conceive an exposure sufficiently prolonged as to cause an entire loss of the high lights. If in such an exposure the shadows have not received sufficient light to produce a strongly developable image, the result on fixing would be an extreme case of over-exposure, as understood by a thin image; but, if during development stray light obtains access to the plate, the shadows fog, and we have reversal.

The original high lights, as we shall see this evening, are both undevelopable and insensitive, therefore do not fog. We may produce this fog by preliminary, concurrent, or supplementary exposure; in all my experiments it is deliberately produced in order to supply the necessary reduction to those parts of the plate not rendered undevelopable by oxidation.

In a reversal exposure this oxidation is regulated by the interposed negative or positive; therefore, when we fog or expose the still sensitive portions of the plate, a reduced image is formed capable of being developed.

In our experiments this evening the reduction will be produced by concurrent exposure, that is, while we are oxidising through the shadows of the interposed negative, we are fogging or reducing through the high lights with stray light.

In order to illustrate this matter, I will expose a plate to magnesium light a sufficient time to enable oxidation to produce the undevelopable and insensitive state; another plate will be taken, and the pair exposed in contact with a negative. I think we shall find one plate give a reversal and the other show it is really undevelopable and insensitive. The insensitive or oxidised plate will show the state of the shadows in the reversal plate, this latter having a gradation of oxidation and the rest of the plate fogged. The insensitiveness may be only comparative, for, though the plate has still the power of producing a print-out image, I have not succeeded in producing a second developed reversal from it. Captain Abney has shown the undevelopable state is due to oxidation.

Although it is possible to produce an exact reversal, I do not think these physical reversals are of much practical account, from the fact that a very exact balance in the two factors of reduction and oxidation is necessary. If the latter be in the least overdone, the delicate tones are oxidised out of existence; or, if the reduction has been too much, delicate tones are fogged and disappear. Under these conditions the gradations are quite false. In some cases reversal improves the result; subjects having too many tones may have the middle tones obliterated. Hard negatives are reproduced perfectly.

I have here a reversal negative, the print from which represents the sixth photographic image. The cloud and cattle negatives were separately taken, and a combination glass positive made from the two; from the positive a contact negative was made, and from this a reversal negative, then from the latter the print.

One of the small prints represents the fifth image, the series being original negative, glass positive, contact negative, reversal negative, and platinum print.

The villa print also represents the fifth image, the series being original negative, silver print, camera negative, reversal negative, platinum print. The river print series runs: original negative, reversal negative, platinum print.

In producing the four prints, nineteen photographic images have exerted their influence, rather a severe ordeal for the original images to pass through. It is unnecessary to say there is some loss. While these are being passed round, I propose making a reversal negative from an ordinary negative.

When making experiments of this kind, the natural conclusion one arrives at is, that dark flashes seen on photographs of lightning are the result of reversal.

In Australia we have some of the finest electric storms, and there I have seen many flashes, the impression of which on the eye was of greater duration than would be due to persistence of vision.

On one occasion I was fortunate in observing a brilliant thread suspended between two clouds for several seconds. I mention this to show there are discharges of exceptional duration.

The light from one grain of burning magnesium is sufficient to produce reversal, as we shall see by experiment this evening. So we may consider a lightning flash having a similar actinic or photographic value should do the same. This value may be due to a discharge of exceptional duration, or to a brilliant flash caused by a maximum electromotive force with a minimum quantity of matter in the path of the flash.

One evening I was observing a display of electric discharges in a large cloud situated on the northern horizon; these discharges were accompanied by sympathetic discharges in a cloud on the southern horizon. The northern cloud was approaching, and I concluded that, should the clouds be at different altitudes, a difference of air currents might enable the one to overtake the other.

A more rapid movement of the northern cloud was soon noticed; a camera, fixed up and carefully focussed on the southern cloud, by aid of the local discharges. All being in readiness, and the shutter of slide drawn, but cap still on the lens, I waited events. When the northern cloud reached the zenith, it began to show considerable symptoms of electric excitement at the edges. Knowing this to be my opportunity, the lens was uncapped, and in about half a minute a pair of brilliant flashes darted from the zenith to the southern cloud. I estimated the duration at over one second.

The plate was immediately developed, but not a sign of the flashes. I expected to find a pair of curly black streaks right across the plate; instead, there appeared a very fair cloud negative, and the black outlines of some buildings low down in the field. These buildings enabled me to verify the position of the camera, which, being attended to, proved the field must have included the flashes. I could never account for getting the clouds and not the flashes, until the matter came to mind whilst making the reversal experiments, and now think the exposure reached the transition stage described in experiment 14 of my paper in the *Club Journal* for September. I give these particulars to show every care was taken in the endeavour to photograph the pair of flashes. * * *

There may be points which, with our present limited knowledge of the dark flash, seem difficult to reconcile, still I think we are pretty safe in accepting reversal as the cause.

One of these points is stated by Professor Burton in *Photography*, September 17, namely, the crossing of dark and bright flashes being bright. This is probably due to an electrolytic creeping action of the deposit across the dark flash during development, and not due to the reducing action of light. If the dark flash be due to the undevelopable state produced by oxidation, then at the point of crossing the difference in condition at the junction between the reduced and oxidised flashes is probably sufficient to produce a difference of potential, that may determine an electrolytic action. A plate brought to the insensitive state by oxidation should form a very fair couple with a plate simply reduced; it is difficult to conceive it otherwise, for where there is reduction or oxidation we invariably find electric energy, and when we find electric energy under suitable electrolytic conditions there we find reduction and oxidation.

HENRY SUTTON.

PREPARING STRONG FERROUS OXALATE.

[A Communication to the Photographic Society of Philadelphia.]

THE strongest form of oxalate developer, made by dissolving ferrous oxalate in potassium oxalate, is not as much used as it deserves to be, the explanation of which, no doubt, is to be found in the very considerable amount of trouble entailed in the ordinary manner of preparing it. Thus, two distinct procedures are required; first, the precipitation of the ferrous oxalate; then the solution of it in the alkaline oxalate, which operation is not very satisfactory on account of the tendency to oxalation if heat be applied for any length of time. In trying to find a more convenient plan of getting a saturated developer I hit upon the following, which I find answers every purpose.

By estimating the quantity of iron actually in solution in different developers, and further by the point (volumetically), when precipitation takes place I found that I could not in any way make a developer which should permanently contain over about 0·65 grains of ferrous oxalate per 10·0 c.c. Acting on this datum I took a saturated solution of potassium oxalate, and to it added an excess of the oxalate, which would be sufficient to convert enough ferrous sulphate to make the 0·65 gramme of ferrous oxalate. The excess of the alkaline oxalate so added was gotten into solution by heat, when the iron was added. In this manner a developer was produced without excess of anything, except the inert potassium sulphate formed in the reaction.

In comparing a developer so obtained with the strongest form of the ordinary one (say, that issued by the Eastman Company for their bromides), we find that the latter contains for every 10·0 c.c. 0·59 gramme ferrous sulphate, which quantity can only give 0·3 gramme of ferrous oxalate, as against at least twice that in a saturated developer.

In practice, the most convenient way to make up is to dissolve the full quantity of alkaline oxalate at once in water, so that the formula reads:—

Potassium oxalate	330·0 grammes.
Ferrous sulphate	135·0 „
Water	600·0 c.c.

Dissolve the oxalate by acid and heat, then cool until it just begins to be precipitated, then add the crystals of iron at once. After solution has taken place, cool completely as rapidly as possible (I place the containing vessel in cold water), and filter off into closed bottles.

In the above we have 250·0 grammes of potassium oxalate which remain in solution, while the other 80·0 grammes are lost in forming the oxalate.

The quantity of water necessary to hold 250·0 grammes of potassium oxalates in solution is 760·0 c.c., but we need only take 600·0 c.c., since the 135·0 grammes of ferrous sulphate will furnish 60·0 c.c., the sulphate crystallising with seven molecules of water.

The oxalate of iron is slowly precipitated after the bottles have stood some time, therefore it is better not to make up a large stock at a time. The formula is calculated to give an excess of ferrous oxalate of 0·15 grammes in each 10·0 c.c., most of which will remain for a short time in solution. The iron and potassium oxalate are balanced.

C. W. MILLER.

COMPOSITION AND SELECTION OF SUBJECT.

[Read before the Holborn Camera Club.]

IN introducing this subject to you this evening I feel that the more I consider it the more difficult it appears to be. It is far removed from the technical subjects which we so frequently have demonstrated so ably to us in this room. I wish it were in my power this evening to be able to practically demonstrate in the field of nature; for, with the camera on its tripod and nature before us, I could soon show you the force of some of the principles which I wish to advocate this subject. The subject of my lecture as issued in the monthly notices is "Composition," but I find it next to impossible to keep it distinct from its sister subject, "Selection of Subject," and it is with your forbearance

that we will consider the two subjects this evening. I find the difficulty in separating the two subjects is, that we must first educate the eye to see in nature what will form a picture, and when this is done to apply the leading principles of composition to it. This cannot be done without study; and, as a rule, when this is disregarded we find that the worker frequently wonders why he cannot get the same result as other workers, who frequently are not perhaps such good photographers from a technical point of view. This is, to some extent, due to artistic training, and the photographer who has these instincts will in most cases excel. I am not advocating that an artist is a born genius, for, in my opinion, his success is only the result of hard study met with frequent failures. But even the failures instruct him, insomuch as they teach him what to avoid. What to avoid; that is the point. If amateurs were to give this a little more thought, their collections of photographs would be very different to what they are at present. We must remember that it is quality and not quantity that should be our aim. Our aim should be to produce work with which we do not tire, and I maintain that a good photograph may do so. It must always appear pleasant to the eye. Not on account of its beautiful shining finish, or its delightful matt surface, but because it portrays to the eye an impression of nature which is beautiful. I would most earnestly urge you to study the selection of subject, and one way in which this may be done is by not missing an opportunity of looking at examples of pictorial art, and at every example look beneath the surface and try to realise what makes it look so pleasant and what mars it. By doing this I am sure you will be able to apply it with ease when out on photography bent.

With regard to composition, I am sure the need to study this important item in regard to photography must be obvious to every member of this Club, for, although it may be quite possible for us to produce fair work accidentally without such knowledge, it is not this that we must seek. I am sure that the earnest endeavours of one and all is to be able to make the most of any particular subject as we see it before us in nature, and I will before you a few well-known rules and try to apply them to photography. We must remember that we have not the free lance of the artist who can omit any objectionable feature that is before him, and, knowing this, it should make us much more careful in our selection of a suitable subject. We must also remember that we are not working in colour but in monochrome, and I venture to say that there is not one of us present who has not noticed the difference between what we imagine we have treasured in our dark slide, and what it eventually turns out to be.

We sometimes wonder, perhaps, at a club outing what Mr. A—— can be doing, and when we ask him how many plates he has exposed he replies, "Not any at present." You have seen him wandering about most probably by himself, focussing several objects, on which many plates have been exposed. What can he be up to? Why is he not satisfied with this or that? You are sure they will come out well. These matters pass through our minds. Well, I will tell you what he is up to. He is looking for a picture and not a mere photograph. He is, perhaps, waiting for a certain light, and later on he will take advantage of that light. I venture to say "that a thing worth doing is worth doing well." It is working at random and taking anything and everything that I am to-night trying to condemn. I think you will agree with me when I say that we are far too anxious to expose our plates, and I think it would be a very good plan, which I believe was suggested by Mr. H. P. Robinson, to ask ourselves the question, "Will it do?" I think that if this question were asked, there would be less exposures and a corresponding gain in the quality of work. The number of negatives which are never printed from is enormous, and the reason why it is so is, because all interest in the subject has ceased on the conclusion of development. Now, "a thing of beauty is a joy for ever," and there are some photographs which never tire one, no matter how long you have had it. Our chief aim should be to produce this sort of work.

You will, I am sure, pardon such a long introduction to the subject really before us this evening. I have nothing very original to tell you. Art is not new, but it has laws which must be obeyed. The eye must be trained to see the making of a picture; and, again, let me impress upon you to look thoroughly at the work of eminent artists, and try to find the reason why the picture is so beautiful. If this advice is followed, I am sure you will be able to apply it to your work with the camera.

I will now briefly mention a few leading features which may assist you:—1. Avoid having the principal objects in the centre of the picture. 2. The horizon should never be in the centre of the picture, but rather below or above it. 3. Avoid straight lines. Take the subject, if possible, at an angle, and you will get a much better perspective of it. It will also tend to break the flatness of the picture. 4. Avoid repetition of lines. 5. Avoid an uninteresting and unbroken foreground. This can often be overcome by the introduction of figures, which, however, must be in their proper place.

In introducing figures be careful that they are in harmony with the surroundings, and be careful also not to include a friend also busy with his camera. Avoid, also, the attention of the figures being directed towards the camera. This is an objectionable feature which spoils so many otherwise good photographs. Take them in as natural a pose as you can, and then your picture will tell its own tale. Assistance in these rules may be gained by ruling the focussing screen into three equal divisions each way, making nine divisions on the screen, and where the lines intersect is termed "the forte points." These are the best positions for prominent features in your picture. They are also generally the best position for the introduction of figures in a landscape.

Now, I must ask you to give an eye to the future of things, and I must ask also you not to think that the following remark is intended in the slightest degree personal. I ask you, Is the outside of a village inn the place for taking club groups, or our friends, the cyclists? This same spot may be an excellent accessory to the villagers, with their waggons and implements of agriculture, but I must certainly raise a protest to any of us handing down to a future age the insinuation that we, when out on our hobby, were all as bad as the proverbial cobbler or tailor keeping St. Monday. A little more thought and seriousness in our work is all that is needed, and let not one of us willingly bring our art science into ridicule. We are here individually to benefit one another, and the knowledge we have I am sure is at the disposal of each member, whether upon the field or upon technicalities. In advancing this we are helping each other in the path we traverse together. Let the path be one of progress. Let each try as they go on to produce better results, and be not discouraged by failures. Let the latter teach us the real road to success.

A. J. Goldino.

NOTES FROM SCOTLAND.

(By Our Special Correspondent.)

As one of the evidences of the generally good state of professiona business, a new departure may be noticed in the "Leaderdale Photographic Art Works," which have been built and opened by Messrs. M. and T. Scott, and are intended to be strictly devoted to artistic work for the profession, they, so far as the public is concerned, entirely sinking their own personality. The present design embraces enlarging, retouching, tinting, painting, copying, &c. The works are situate in one of the finest positions possible, on the outskirts of a city which is of itself almost a romance, at the base of Blackford-hill, of the view from which Sir Walter Scott makes Blount say, after he has fully described its beauties, and been animated by the prospect—

> "Where is the coward who would not dare
> To fight for such a land?"

Having paid a visit there recently, a description of their appliances and methods of work may prove practically valuable, especially to those desirous of going in for a big thing, and establishing other proofs that professional photography is not yet played out.

The place is of easy access by road, tramways, and rail from every part, and in going so far afield care has been taken that there can be no building up; the district having been secured by the city as a public park in perpetuity, thanks to the authorities; but none to those who, in the midst of this sylvan beauty, chose to erect an iron and stone ornamental gate, as a monument to Sir George Harrison, who, as Lord Provost and M.P., secured this unique park for the city. Think, citizens! inhabitants of London! of an ornamental gate to Epping Forest or to Hampstead Heath! That is the one detraction to the otherwise fine situation of this establishment, devoted to artistic photography. In all the rest it has secured a position, as Artemus Ward remarked, "ekalled by few and surpassed by none."

Entering by the carriage way, the entire arrangements are on the ground-floor level, there being abundance of space. The studio proper has been treated with a double-ridged roof, the area (32 × 28 feet) being so arranged that it can be made into two by means of a curtain. The lighting is from north and east. Adjoining this is the artistic workroom, which has ample desk and studio accommodation for many artists, the north light being here utilised. The comforts of the lady artists are fully attended to, there being cloak-rooms, lavatory, dressing-rooms, and so forth. In the dark room, which is also used for the enlarging apparatus, there is ample room for moving about, the space being about 26 × 22 feet, with similar great height of ceiling as the artists' room has, at least fifteen feet. The enlarging apparatus, of which there are at present two, are upon the floor level, and arranged to focus by sliding on rails, fixed in the cemented water and damp-tight floor, so that any enlargement up to four and a half feet in height can be made easily, the workers moving about in the large, well-heated and lighted *camera obscura* as in a large hall, the light being non-actinic. For such sizes, as, indeed, for all large increments, the much belittled, derided, but best of all processes for this kind of work, the old wet collodion, only is used. The size of the baths and the treatment of plates where feet are measurements in place of inches may be imagined by the workers of hand cameras of quarter or half-plates, and will be described more fully later on. In addition to the arrangements for coating such large plates, what may be called the permanent structures must be noted. The developing sinks or trays are in proportion to the plates, and are built entirely of seasoned teak wood. The water supply, which is almost pure, is practically illimitable, and, by skilled plumbing arrangements, so arranged that the operator can have at will either a few drops or full force from the main stream, which supplies Edinburgh, and this, by rose jets, is passed over the plates almost as fine as spray by the operator, or fuller if desired. The drainage, which is as essential as the supply, has been most carefully managed, separate outlets being arranged for the catchment of the necessarily large amount of silver waste and of the much greater quantity of washing waters, and free ventilations of both systems has been fully provided for.

One feature of all the drainage pipes are claimed by the sanitary

engineers, who have carried out this work, as being perfect. They are glass coated internally and externally to prevent corrosion, but that must be taken *cum grano salis*, the different expansions of glass and metal, or any other material, must ultimately result into cracks, into those cracks the waste chemicals will seek a way, and so they may be after all only what time will prove. The intentions have been of the best; the saving appliances will of themselves pay new sets of pipes, so perfect are they.

In the operating room with large plates, the fixing of which is by cyanide of potassium, there is always the difficulty of the emanation from it, and its effects on those engaged in the work. This is reduced to its minimum by using dipping baths and those kept so far covered, as well as by the efficient system of ventilation adopted.

The printing department is quite as fully equipped, the sensitising rooms for silver platinum and carbon, communicating by sliding doors, the drying rack, sliding up in the air out of the way of the workers or of dust. The temperature, which is carefully regulated throughout, is maintained by hot water pipes. Where deemed necessary, as in the case of acid solutions, slate sinks are adopted, as is also lead, where that metal is deemed most suitable, as in the case of cyanide. A very useful arrangement for the drying of gelatine negatives, is a large sheet iron stove, suitably racked for different sizes, and capable of regulation to any desired heat, gas jets being used for this purpose with a free circulation of air.

This paper has extended to too great a length to admit of lucid description of the cameras, enlarging apparatus, and the tools and apparatus therewith connected which are of special interest, and so must be left for another occasion. The architects, Messrs. M'Arthy & Watson, who seem to make a speciality of this class of structure, have great credit in designing and carrying out a very perfect photographic artist's workshop.

THE CHICAGO EXHIBITION

GENERAL REGULATIONS FOR FOREIGN EXHIBITORS.

1. The Exhibition will be held on the shore of Lake Michigan, in the City of Chicago, and will be opened on the 1st day of May, 1893, and closed on the 30th day of October following.

2. All Governments have been invited to appoint commissions for the purpose of organizing their departments of the Exhibition. The Director-General should be notified of the appointment of such foreign commissions as soon as the appointment is made.

Diagrams of the buildings and grounds will be furnished to the foreign commissions on or before January 1, 1892, indicating the localities to be occupied by each nation, subject, however, to revision and re-adjustment.

3. Applications for space and negotiations relative thereto must be conducted with the commission of the country where the article is produced.

4. Foreign commissions are requested to notify the Director-General not later than June 1, 1892, whether they desire any increase or diminution of space offered them, and the amount.

5. Before November 1, 1892, the foreign commissions must furnish the Director-General with approximate plans, showing the manner of allotting the space assigned them, and also with lists of their exhibitors, and other information necessary for the preparation of the official catalogue.

Products brought into the United States at the Ports of Portland, Maine, Boston, New York, Philadelphia, Baltimore, Tampa, New Orleans, San Francisco, Wilmington, Portland, Oregon, Port Townsend, Wash., Seattle, Wash., Tacoma, Wash., and Chicago, Ill., or at any other port of entry, intended for display at the International Exhibition, will be allowed to go forward to the exhibition buildings, under proper supervision of customs officers, without examination at such ports of original entry, and, at the close of the Exhibition, will be allowed to go forward to the port from which they are to be exported. No duties will be levied upon such goods, unless entered for consumption in the United States.

6. The transportation, receiving, unpacking, and arranging of the products for exhibition will be at the expense of the exhibitor.

7. The installation of heavy articles requiring special foundations or adjustment should, by special arrangement, begin as soon as the progress of the work upon the building will permit. The general reception of articles at the Exhibition buildings will commence on November 1, 1892, and no articles will be admitted after April 10, 1893.

8. Space assigned to foreign commissions, and not occupied on the 10th day of April, 1893, will revert to the director-General for re-assignment.

9. If products are intended for competition, it must be so stated by the exhibitor; if not, they will be excluded from the examination by the international juries.

10. An official catalogue will be published in English, French, German, and Spanish. The sale of catalogues is reserved to the World's Columbian Exposition.

The twelve departments of the classification which will determine the relative location of articles in the exhibition (except in such collective exhibits as may receive special sanction), also the arrangement of names in the catalogue, are as follows:—

A. Agricultural, Forest Products, Forestry, Machinery and appliances.
B. Viticulture, Horticulture, Floriculture.
C. Live Stock: Domestic and Wild Animals.
D. Fish, Fisheries, Fish Products, and Apparatus for Fishing.
E. Mines, Mining, Metallurgy.
F. Machinery.
G. Transportation: Railways, Vessels, Vehicles.
H. Manufactures.
J. Electricity.
K. Fine Arts: Pictorial, Plastic, and Decorative.
L. Liberal Arts: Education, Engineering, Public Works, Architecture, Music, and the Drama.
M. Ethnology, Archæology, Progress of Labour and Invention, Isolated and Collective Exhibits.

11. Foreign commissions may publish catalogues of their respective sections.

12. Exhibitors will not be charged for space.

A limited quantity of steam and water power will be supplied gratuitously. The quantity of each will be settled definitely at the time of the allotment of space. Any power required by the exhibitor in excess of that allowed will be furnished by the World's Columbian Exposition at a fixed price. Demands for such excess of power must also be settled at the time of the allotment of space.

13. Exhibitors must provide, at their own cost, all show-cases, shelving, counters, fittings, &c., which they may require, and all countershafts, with their pulleys, belting, &c., for the transmission of power from the main shafts in the building where the exhibit is located. All arrangements of articles and decorations must be in conformity with the general plan adopted by the Director-General.

Note.—The general plan requires all decorations, signs, &c., to be in harmony with the dignity and magnitude of a magnificent exhibition, and the Director-General is empowered to secure this result.

The World's Columbian Exposition will take precautions for the safe preservation of all objects in the Exhibition, but it will in no way be responsible for damage or loss of any kind, or for accidents by fire or otherwise, however originating.

Note.—A thoroughly equipped fire department will protect the buildings and exhibits, and a large police force will maintain order. The entire Exposition grounds will be under the immediate supervision of the City of Chicago and of the State of Illinois. A guard, equal to any possible contingency, is thus provided, the municipal authority being upheld, if necessary, by the State troops, and the State by the army of the United States, so that no apprehension need arise as to losses resulting from lawlessness.

14. Favourable facilities will be arranged by which exhibitors or foreign commissions may insure their own goods.

Note.—Special care has been taken to render everything about the Exposition as nearly fire-proof as possible; and it is reasonably certain that the rates of insurance will not be excessive, but, on the contrary, very reasonable. Exhibitors may insure in any company, foreign or domestic. Arrangements will be made with English, French, German, and American companies to fix uniform or special rates on exhibits and buildings; so that no advantage will be taken of any exhibitor who wishes to insure his goods.

Foreign commissions may employ watchmen of their own choice to guard their goods during the hours the Exposition is open to the public, subject to the rules and regulations of the Exposition.

15. Foreign commissions, or such agents as they may designate, shall be responsible for the receiving, unpacking, and arrangement of objects, as well as for the removal at the close of the Exposition; but no person shall be permitted to act as such agent until he can give to the Director-General written evidence of his having been approved by the proper commission.

16. Each package must be addressed "To the Commission (name of country) at the World's Columbian Exposition, Chicago, United States of America," and should have at least two labels affixed to different, but not opposite, sides of each case, and give the following information:—

17. (1) The country from which it comes; (2) name of firm of the exhibitor; (3) residence of the exhibitor; (4) department to which objects belong; (5) total number of packages sent by that exhibitor; (6) serial number of that particular package.

18. Within each package should be a list of all objects.

19. If no authorised person is at hand to receive goods on their arrival at the Exposition buildings, they will be removed without delay, and stored at the risk and cost of whomsoever it may concern.

20. Articles that are in any way dangerous or offensive, also patent nostrums and empirical preparations, whose ingredients are concealed, will not be admitted.

21. The removal of goods on exhibition will not be permitted prior to the close of the Exhibition.

Note.—Articles not on exhibition for competition may be sold under special permit.

22. Sketches, drawings, photographs, or other reproductions of articles exhibited will only be allowed upon the joint assent of the exhibitor and

the Director-General; but views of portions of the buildings may be made upon the Director-General's sanction.

23. Immediately after the close of the Exhibition, exhibitors shall remove their effects, and complete such removal before January 1, 1894; goods then remaining will be removed and sold for expenses, or otherwise disposed of under the direction of the World's Columbian Exposition.

24. Each person who becomes an exhibitor thereby acknowledges and agrees to be governed by the rules and regulations established for the government of the Exhibition.

Special regulations will be issued concerning the exhibition of fine arts, awards, the organization of the international juries, and sales of special articles within the buildings, and on other points not touched upon in these preliminary instructions.

25. All communications concerning the Exhibition will be addressed to the Director-General, World's Columbian Exhibition, Chicago, Illinois, U.S.A.

The management reserves the right to explain or amend these regulations, whenever it may be deemed necessary, for the interest of the Exhibition.

—*Journal of the Society of Arts.*

The following articles were received too late for the Almanac:—

A SIMPLE COPYING STAND.

By Thos. Boxell.

In rebuilding my studio last year, I found I could not copy pictures at one corner only (as I had been in the habit of doing in the old studio) without a flare on them, unless done at one particular time of the day. I therefore hit upon the following very simple plan, viz.:—I got a piece of board very similar in shape to a cricket bat, but, of course, flat, the handle of which I inserted into the bottom half of the head rest, which, as may be supposed, can be placed at any angle from the light, raised up or down, and is as firm as a rock. On the bat I have a ledge, where the photograph to be copied rests, which is held in its place by a piece of glass larger than the photograph, which also rests on the ledge, and is fastened at the top by a button similar to those used to fasten cupboard doors. There is, therefore, no damage done to the original photograph by the use of pins or tacks, and they can be changed with great rapidity. I ought also to state that the bat is held firm by the ordinary screws of the head-rest, and when the copying is done the bat is taken out and the head-rest used as usual.

ON FERROCUPRIC RED-BROWN PRINTS AND EASTMAN'S TRANSPARENT FILMS.

By G. A. Kenyon, M.B. (Lond.)

By way of contribution to the Almanac, I should like to put on record my experience with—

1. Eastman's transparent film. This I find simply perfect for small negatives for enlargement. Other transparent films are too thick; but this can be enlarged from as easily as glass, and definition is very good, owing to the fineness of the deposit. For want of practice, I have not yet quite overcome the difficulties arising from the cockling of the film in the developer, so as to make a perfect result a matter of certainty, but this is only an affair of time. And,

2. As to the exquisite beauty of the results obtainable by the Obernetter's ferrocupric process described at page 365 of The British Journal Photographic Almanac for 1889, which I demonstrated before the Liverpool Photographic Association this summer. The description given is rather inadequate; perhaps it was good luck enabled me with perseverance to get proper results, which were of a fine reddish-brown colour, very desirable, and of most exquisite detail; although done on common writing paper, there was no sinking in, and absolutely no loss in fixing, so that a magnifying glass could be used to render visible the finest and most minute points. The only drawback, the slowness of the printing, except in direct sun with clear negatives, was entirely overcome by using cold platinotype, *i.e.*, ferric-oxalate paper; only then an increased amount of sensitiser had to be added to the developer to make up for the absence in the paper of copper salts, with the result that the lights became slightly muddy, which spoiled the beauty.

The special point in which the description fails is the omission of any statement of the fact that during the washing after development the image entirely disappears, and one might think it was lost; but it comes back when placed in the solution of ferridcyanide of potassium.

A "ROCKER" WORKED BY A PENDULUM.

By W. K. Burton (Tokio.)

I see that, some time ago, there was a discussion at a meeting of the London and Provincial Photographic Society about "rockers;" or, to speak more correctly, it was suggested that there should be a discussion, but the only result was that Mr. A. Mackie humorously remarked that "the first rockers worked beautifully, but only with an empty dish."

Taken "humorously," I think Mr. Mackie's remark is very true. In other words, it is wonderful how a few ounces of developer in a dish "deadens" any rocking motion that is not very energetic, or extremely slow. A heavy pendulum, for example, with a top piece in the form of a small table for holding the developing dish, may swing for an hour, either unloaded, or with an empty dish, say, 12 × 10, but let a few ounces of developer be poured into the dish, and it is astonishing how few seconds it will take for the pendulum to come to rest, unless it is extraordinarily heavy, and is also very long.

I have had some experience with "rockers" of the kind mentioned—the simplest possible kind. I set up the first one two or three years ago. It consisted of a twelve-pound shot at the end of a pendulum three feet long, hung over a bit of an old Japanese sword-blade as a knife-edge. It was so frictionless that it would swing for more than an hour unloaded, yet if a 12 × 10 dish were placed on it, and ten ounces of water were poured into the dish, the pendulum would be completely at rest at the end of twenty seconds. It was therefore of very little use.

I gave a little thought to the matter, and, with a few experiments, found out that the "deadening" action varied greatly with the size of the dish, but principally with its length in the direction in which the wave passed. Thus, if the 12 × 10 dish were so placed that the wave passed across it, the pendulum would swing twice as long as if the wave passed along it. I further found that, if the period of swing of the pendulum corresponded to the wave period of the bath, the deadening action was reduced to a minimum, and that it was much less if the pendulum period were longer than the wave period than if it were shorter.

It is impossible to have a pendulum whose period will correspond with those of the waves in different sizes of dishes, and impracticable to have one whose period will even correspond with the wave period in one size of dish, as the period of wave varies with the depth of liquid in a flat-bottomed vessel. It is evident that the only thing to do is to have as heavy a pendulum as possible, and to have as long a rod as is practicable, so that the period will be very slow. It is not likely to be practicable to get a pendulum so long that the period of motion would be too long. A "three-seconds" pendulum is nearly thirty feet long.

My own limit was reached with a thirty-two-pound shot at the end of a rod six feet long, itself weighing about six pounds. I found that with this a 12 × 10 dish was kept in motion from one to two minutes with the wave passing lengthways, nearly three minutes passing crossways, whilst with smaller dishes the time was longer. I think that, with a cabinet dish, the motion will continue for nearly an hour.

I find the arrangement a great convenience. Indeed, I found the first one a convenience, because it is so much easier just to give the pendulum rod a touch now and then than to have to keep the dish in the hand, or even than to have to lift it every few seconds and give it a rock.

To those who want a "rocker," my advice is to get the heaviest mass of metal at hand, and to make the longest practical pendulum with it. Of course, if the pendulum is more than about three feet long, it must pass through the floor.

Our Editorial Table.

The Studio and What to Do in It.

By H. P. Robinson. London: Piper & Carter, Furnival-street, E.C.

We are glad to see a reissue of this standard work. We have already reviewed it, hence there is no necessity for reiterating our high opinion of its excellence.

Rouch's "Excelsior" Hand Camera.

This new hand camera is an evolution of the well-known "Eureka" of Messrs. Rouch & Co., and much ingenuity has been displayed in its construction. While the external dimensions, when packed for carrying, remain the same, it has been made amenable to several improvements of a marked nature. First of all, it is capable of being

focussed, this focussing embracing a range so great as to permit of either of the two lenses with which it is fitted—one of a long, and the other of a very short focus—being used. To do this with accuracy, there is a double graduated scale and index on the top, this adjustment being operated by a rack and pinion. It has also a rising front, the utility of which is well recognised. The shutter is capable of receiving any degree of speed, from the highest to the lowest, including time exposures. It has two finders; and, to sum up, the changing back, which contains twelve plates, can be detached from the camera in the open fields, and another, containing unexposed plates, substituted for it. In this way the supply of plates which may be brought in the field is practically unlimited. The size of the "Excelsior," with a reservoir of plates, is only $8 \times 5 \times 4\frac{1}{2}$ inches.

The Principles of a Photographic Lens Simply Explained.

This pamphlet, by R. & J. Beck, Cornhill, London, forms a reply to questions constantly being asked of the authors by photographers who want to know the most suitable lens for any particular kind of work, and the meaning of the terms angle, aperture, and focus of a lens. The authors treat of pinhole photography, showing that a pinhole has no focus, has unlimited depth of definition, no distortion, and no rapidity. In treating of lenses some excellent and suggestive hints are given, together with a compendious catalogue of the productions of the firm. It may be had free on application.

The Photomnibus.

Under this designation Messrs. Wormald & Co., Sutton, Surrey, have brought out, at the low price of half-a-crown, a photographic camera. Of course it has no lens, a pinhole in front forming a substitute. Still, judging from specimens which accompany the "Photomnibus," it is possible to take fair photographs by it.

We have received from Messrs. Percy Lund & Co. a finely bound copy of Vol. II. of the *Practical Photographer*, printed on toned paper.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 21,933.—"Improvements in Photographic Lenses." T. R. Dallmeyer.—*Dated December 15, 1891.*

PATENTS COMPLETED.

A New or Improved Printuline Printing Process.

No. 17,484. Edward William Foxlee, 22, Goldsmith-road, Acton, London, W., and Thomas Bolas, 8, Grove-terrace, Chiswick, Middlesex.—*November 4, 1891.*

In the printuline process of photography, as introduced by Messrs. Green, Cross, & Bevan, and now well known amongst photographers, and described in the Specification of Patent No. 7453 of the year 1890, and on pages 657 and 658 of The British Journal of Photography, October 17, 1890, diazotised fabric, paper, or other material, was submitted or exposed to the action of light to obtain any desired impression by placing it, in either a wet or dry state, under the object or design to be printed, and causing the rays of light to pass through or around the latter to the diazotised fabric, paper, or material. According to our invention we dispense with the action of light, and substitute therefor the action of heat, whereby we produce a novel printing process. In carrying the invention into effect we find it convenient to employ a metal plate, stamp, roll, or stencil, either cut by hand, etched, or photographically or otherwise engraved, but other suitable solid substance may be employed, either as engraved plates, blocks, or rolls, or as stencils; in using these plates, blocks, or rolls, we first heat the same, and then press them by any suitable means upon the diazotised fabric, paper, or material, and afterwards we submit the latter to a similar treatment to that used in the printuline photographic process after its submission to light, as described in the above-mentioned publication. In using a stencil we apply heat thereto in any convenient way, such, for example, as by causing a highly heated block or roller to press thereon sufficiently long to cause the change in the diazotised fabric, paper, or material, through the interstices or perforations of the stencil, but not long enough to cause the heat to be transmitted through the solid part of the stencil. Or we employ radiant heat or a current of hot air, gas, or steam to act upon the diazotised fabric, paper, or material through the interstices or perforations of the stencil.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—1. The new or improved printuline printing process, substantially as herein described. 2. A printuline printing process in which the action of heat is employed to obtain the impression, substantially as herein described.

Improvements in or Appertaining to Apparatus for Changing the Views in a Magic Lantern.

No. 14,734. Charles William Hudson, B.Sc., York-buildings, Dale-street, Liverpool, Lancashire.—*November 7, 1891.*

This invention relates to certain improvements in or connected with apparatus for changing the views in magic lanterns, its object being to provide means whereby the lens—or, what is the same thing, the luminous field of the screen upon which the views are projected—may be more or less obscured during the changing of the plates or transparencies in the lantern.

In carrying the invention into effect, I arrange, in connexion with the plate carrier or slide, a shield which is adapted to be operated in such manner that, prior to the movement of the carrier to change the view, the lens is obscured, and, during the movement of the carrier, remains obscured, being again placed in an unobscured condition after the movement of the carrier is complete. All these movements of the carrier and the obscuring device are performed in their proper order by the simple movement of an operating lever connected by suitable mechanism to the carrier and shield.

The claims are:—1. In conjunction with the plate carrier of a magic lantern, and with a movable shield for obscuring the lens thereof, mechanism connected with said plate carrier and shield, and so combined and arranged that, during the middle portion of the travel of an operating lever, the lens is obscured by the shield and the carrier operated, while, during the initial and terminal portions of said lever's movement, the shield is moved to respectively obscure and unobscure the lens without a corresponding movement of the carrier, substantially as described. 2. The combination, with the plate carrier and the revolving shield, of the lever movable with the carrier and the operating handle movable with the shield, and so mounted and arranged with respect to said lever that it is automatically coupled to the latter during the middle portion of the stroke and uncoupled therefrom during the initial and terminal portions of its stroke, substantially as and for the purposes described. 3. The improved apparatus for temporarily obscuring the lens of a magic lantern, taken as a whole, and combined and arranged substantially as shown and described.

Cutting Glass Plates by Machinery.

No. 456. William John Wilson, 6, Malden-road, Watford, Herts.—*November 14, 1891.*

My invention has for its object the cutting of glass plates (particularly those intended for photographic purposes) by machinery, whereby the operation is effected with far greater rapidity and precision than by hand, as hitherto practised.

In carrying out my invention, the plates are presented in succession to the cutting tools, and, according to one arrangement, the cutting is effected by the motion of the plate under the stationary tool or tools, which are mechanically brought down and pressed on the plate at the proper time, whilst, in another arrangement the cutting is effected by the motion of the cutting tool or tools over the plate whilst the latter is at rest.

The first arrangement comprises an endless carrier band upon which the plates are laid in continuous succession, and provided with means whereby the plates are gripped or carried along and presented to the action of the cutting tool, the carrier being suitably supported under the pressure of the cutting tool. The latter is a diamond carried on a holder mounted above the carrier, and brought down at the proper moment as each plate comes beneath it, and raised again after completing a cut by a quick-acting mechanism operated from the carrier or from one of its driving rollers, the pressure of the tool upon the plate being regulated by a spring or weight, as many such tools being used as it is required to make parallel cuts at one time.

The other arrangement comprises a rotating table provided with mechanically actuated grippers, or equivalent means, whereby the plates laid upon the table in continuous succession are firmly held when under the action of the cutting tool or tools. The table receives intermittent motion through successive portions of a revolution, with intervening periods of rest, and a plate laid on the table during a period of rest is by the next partial revolution of the table brought into position to be acted on by the cutting tool during the next period of rest. The cutting tool is mounted in a sliding carriage, working on guides above the table in such manner that the tool may be brought down upon the plate, drawn across it, and lifted, after which it returns to its original position during the next partial revolution of the table, in readiness for operating on the next succeeding plate. If the plate is to be again cut at right angles to the direction of the first cut, it is brought by such partial revolution under a second tool, similarly mounted and operated, by which it is cut during the next period of rest, the guides for this second carriage being, of course, suitably arranged in the desired direction of the cut to be made. After the cutting is completed, the grippers release the plate at the next stoppage, and it is removed from the table.

Each carriage may carry as many diamonds as there are parallel cuts to be made at one time, and the carriages may be operated by hand or by mechanical means, from the axis about which the table rotates, or otherwise.

[The full specification is illustrated by five sheets of drawings.]

The next One-man Exhibition at the Camera Club will be devoted to the pictures of Mr. J. Pattison Gibson. The Exhibition opens on Tuesday next.

Intending exhibitors at the forthcoming Chicago Exhibition will do well to peruse the general regulations for foreign exhibitors, which we print on page 11.

We are sorry to learn of the death of Mr. R. Turnbull, of Glasgow, who succumbed to influenza. Mr. Turnbull will be remembered as a prominent member of the Photographic Convention of the United Kingdom. He not long since bought Mr. A. L. Henderson's London business. He was a photographer of very considerable skill, and enjoyed a great deal of success.

To keep unmounted prints flat, Mr. Albert Levy recommends the following method. It is one which he personally employs:—Take a piece of rubber sheet, about three-eighths to half an inch thick, and, pressing the face of the photograph gently down on it with a wooden paper-knife's edge, pull the photograph lightly through it several times, until you obtain the opposite result, viz., a pronounced bend backward. Then lay under pressure for a day or two flat—in a book or under one—and henceforth it will remain flat, unless rolled up again purposely.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
January 5	North London	Wellington Hall, Islington, N.
,, 5	Sutton	Sutton Scientific Society's Rooms.
,, 5	Sheffield Photo. Society	Masonic Hall, Surrey-street.
,, 6	Coventry and Midland	Technical Institute, Coventry.
,, 6	Edinburgh Photo. Society	Professional Hall, 20, George-street.
,, 6	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 7	Bolton Photographic Society	The Baths, Bridgman-street.
,, 7	Leeds	Leeds Mechanics' Institute.
,, 7	Dundee and East of Scotland	Lamb's Hotel, Dundee.
,, 7	Glasgow Photo. Association	Philosophical Rooms, 207, Bath-st.
,, 7	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 8	Ireland	Soc.'s Rms., 15, Dawson-st., Dublin.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

DECEMBER 22—Technical Meeting.—Mr. A. Mackie in the chair.

The CHAIRMAN observed that at a former meeting he had stated that the hypo and potassium ferridcyanide reducer, used for removing the image, always left a deposit in the film. He recently applied this reducer to films for a quarter of an hour, and had then washed them. The films were stained, but the stain was got rid of by further washing. The image could still be seen. With potassium bichromate and sulphuric acid the stain could not be got rid of. He had tried to re-develop one of these plates, but only got a stain over the plate.

Photographs of a spider's web by Mr. H. P. Chandler, as also strips of a plate exposed to a gas flame for geometrically increasing periods, and subjected to various modifications of the developer, to illustrate the different degrees of density obtainable, were exhibited.

Mr. E. W. PARFITT asked the best way to photograph hoar frost on a window pane?

Mr. WILLIAM ENGLAND suggested a piece of black velvet, placed at an angle at the back of the window.

Mr. J. D. ENGLAND said that, to produce the effects desired, it was not necessary to photograph frost, as a great many crystallisable salts could be used to give the same effects.

A number of magnesium flashlamps, including Vever's, Hibbert's, Shew's Fusee (single and continuous flashes), and England's, were then demonstrated, and the meeting terminated.

North Middlesex Photographic Society.—December 28, Mr. J. W. Marchant (President), in the chair.—Mr. J. F. SMITH, F.R.M.S., showed prints from a number of negatives in duplicate on Obernetter and Ilford printing-out paper. In some cases even Mr. Smith could not say which was which; in others the advantage leaned sometimes to one side, sometimes to the other, the general opinion being that the papers were equally good. Mr. Marchant then related an extraordinary experience which he had had. He had made an exposure by gaslight on a vase of flowers, and on developing the plate found it much under-exposed. Having forced the development as far as possible, and the image being barely discernible, he lit the gas, and, taking the plate from the bath, showed it to his son, pointing out the lack of detail. While they were looking at it, a positive image of the son's face appeared on one corner of the plate, about the size of a halfpenny. Thinking it must be a reflection, Mr. Marchant altered the position of the plate, and the lad walked away. Mr. Marchant was astonished to find that the image remained. He showed it to his son, who recognised the portrait, and while they were looking at it the image increased in strength and clearness, until, in a few minutes, the plate fogged all over, and the image was obliterated. The matter was discussed, and as the developer had not been washed from the plate, and bearing in mind the peculiar effects produced in the way of reversal by prolonged exposure, supplementary exposure, &c., it was felt that the mere development of the image, and in a positive form, might be explained if it could be shown how the reflected light from the boy's face came to be converged on the plate. It was suggested that Mr. Marchant's spectacles might have focussed the rays, but the difference in height of the two actors made this improbable. Mr. MARCHANT explained that the plate had been taken from the maker's box immediately before the exposure, could not have been in contact with any negative or print of his own, and, indeed, that no portrait in the same position existed. The matter was voted a mystery, and explanations are invited. Mr. H. SMITH called attention to the new developer "Rodinal," and a short discussion followed.

South London Photographic Society.—December 21, Mr. F. W. Webb in the chair.—The evening was devoted to the explanation and demonstration of various "printing processes." The Autocopyist Company, London-wall, E.C., first gave a demonstration of their method of easily producing a large number of permanent prints. Prints in platinum (the President), silver (Mr. Herbert), and bromide (Mr. Whitby), from a 12×10 negative of Shanklin Chine, were then compared and examined. Mr. HERBERT said it was always his practice, in silver printing, to salt the paper before toning in a bath containing one ounce of salt to a pint of water, as it produced more brilliant prints. The prints were then washed twice in water, and toned in a borax bath—half a teaspoonful of borax to a pint of water. The quantity of gold required varied with the brand of paper used. The toning action was stopped by placing the prints in water. As a preventive of blisters, he used a fixing bath made as follows: Two ounces of hypo, dissolved in perfectly cold water, and a teaspoonful of borax in half a pint of warm water, the two being mixed together before using. Mr. MILLER said he always used a few drops of ammonia for the same purpose. It also assisted in washing out the hypo. Mr. WHITBY, in explaining the method of printing on bromide paper, said that he considered it possessed advantages over other methods of printing. To get rid of any yellow stain which might be left after development and washing, he used a strong solution of tartaric acid. Prints could be reduced in a dilute solution of chloride of lime. Fading was the result of insufficient washing.

Bath Photographic Society.—December 17, Mr. W. Pumphrey in the chair.—Mr. HEDLEY M. SMITH discoursed on the Kodak form of hand camera, explaining fully the working details of the several instruments bearing that name.

DECEMBER 18.—The members of the Society filled the lecture programme of the Literary and Philosophical Association. The CHAIRMAN (Mr. W. Pumphrey) said the Society felt honoured in being requested to fill up that evening with matters of photographic interest. In the first place, Mr. P. Braham would photograph a microscopic object, and explain the method of doing so. Then he (the Chairman) would exhibit on the screen a series of photographs taken by him in the North of Ireland last September. The Chairman then referred in detail to photographs exhibited by Messrs. Appleby, Dugdale, Lambert, Lewis, Perren, Powell, Payton, Howe, Wells, and himself, which were displayed for examination.

Glasgow and West of Scotland Amateur Photographic Association.—December 24, Mr. John Morrison, jun. (President), in the chair.—The office-bearers for the ensuing year were nominated, and Mr. William Goodwin (Hon. Secretary) read a paper on *Lenses*.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

THE PHOTOGRAPHIC SOCIETY.

To the EDITOR.

SIR,—To Mr. Mackie's last handful of mud, as far as it concerns myself, I have only a short reply. He says I used certain words on a certain occasion, and spoke one of them in italics. I say that I did not, and could not have used them, therefore it is reduced to a matter of veracity between him and me. I am content to leave it there. My reputation is quite safe in the hands of photographers.—I am, yours, &c.,

Tunbridge Wells, December 26, 1891. H. P. ROBINSON.

To the EDITOR.

SIR,—There is one part of Mr. Chapman Jones's letter, which appears in your last issue, which ought not to be passed without notice, as it appears not to accord with the sense of what that gentleman said at the meeting of the Society on the 8th inst. At that meeting Mr. Jones was asked if he could support the view that the scandal, that Mr. Robinson had suggested places of honour for his own pictures, did not take place. His reply, apparently somewhat reluctantly given, was that it was impossible for him to say that it did not take place. He further admitted that Mr. Robinson said that he should like his pictures hung at a certain spot, thus supporting the *gravamen* of the charge made against Mr. Robinson. Mr. Jones now says that, if any extraordinary speech had been delivered in his hearing, he should have noticed it, and he regards the decisive statement attributed to Mr. Robinson as extraordinary. As the decisive statement referred to and Mr. Jones's own statement differ only as to the reason assigned by Mr. Robinson for his request, Mr. Jones is apparently leading us to understand that he is able to draw an impossibly minute distinction between ordinary and extraordinary, in a matter in which he avowedly cannot trust his memory, but in reality he is attempting to discredit by implication a statement which he dare not contradict.—I am, yours, &c., ALEXANDER MACKIE.

3, *Upper Baker-street, N.W., December* 28, 1891.

To the EDITOR.

SIR,—Editors—as you, of course, are aware—are a long-suffering race; they have much to put up with, so have their readers; but the line should be drawn somewhere. For more than three months the "P. S. G. B." incident, as it has been called, has occupied valuable space in most photographic journals, and scores of letters and paragraphs have appeared on the subject. The half-dozen gentlemen immediately concerned may take some interest in the matter; but I put it to you, Mr. Editor, with all submission, candidly, now, don't you think the generality of your readers have had nearly enough of it? The "incident" itself was a very trivial matter, and reflects credit on nobody concerned. Besides, the old lady in Great Russell-street has solicited all the photographic societies to become affiliated with her, and, more curiously still, sixteen have already consented to be received into her maternal bosom. Several others are hanging aloof, wisely waiting to see what is to be gained by their union with a Society which makes such a muddle of its own affairs and don't apparently understand its own rules and bye-laws.

The more this correspondence is prolonged, the less respect will be felt for the Society and those responsible for its management. The "incident" was regarded by many as a good joke at first, but the fun has been washed out of it long ago. Please, therefore, Mr. Editor, *draw the line*, and let me conclude, as our old friend Sam Weller did on a memorable occasion, with a "werse:"—

Oh, please, Mr. Editor, stop it,
We're sick of the subject, so drop it,
And each letter you get from this quarrelsome set
In the waste-paper basket, please "flop it.'

—I am, yours, &c., DROP SHUTTER

December 29, 1891.

BLISTERS.

To the EDITOR.

SIR,—Anent the remarks on blisters in your last issue by Mr. W. B. Bolton, the use of a weak hypo bath is given as a sure preventive of blisters, and not a risky one as to their permanency. Many years ago a paper was read before the Photographic Society of Great Britain, in which the author demonstrated that, to ensure *absolute* permanency, each print must be fixed separately in fresh hypo solution. This may be theoretically correct, but actually impracticable, and in dealing with numbers of prints a plan must be devised to fix them all properly, and a number at the same time. The danger of using a weak hypo bath is that, at any rate, the last prints treated are more likely to be only partially done; but, setting aside this reason, a weak bath, long applied, is different in its action to a stronger one for a shorter time. Mr. Bolton, as a clever experimenter, is aware of this, and, in treating a batch of prints, I am afraid those fixed in a weak bath would hardly hold their own as regards permanency with others fixed in a stronger one.

Often a fair degree of permanence is obtained under conditions that would indicate rapid deterioration. Why they remained unchanged for a considerable period can only be attributed to the use of strong solution to start with, as in the case I allude to; the same solution of hypo was used day after day, until it was quite discoloured—I may say black—and the prints had a few changes of water, and were then considered finished so far as fixing and washing went. Permanency seems to depend much more on the thorough solution of the silver salts out of the prints than washing afterwards. The prevention of blisters is the point at issue; as with Mr. Bolton, I find sometimes that reducing the strength of the hypo would ameliorate the trouble, but again it would have little or no effect. My experience has been chiefly with home-sensitised paper, and I feel convinced that the cause is in the preparation of the paper *before* it comes into the hands of the *sensitiser*.

I have occasionally seen blisters on the prints in the *toning bath*, but only a few times, which, at any rate, is sufficient to prove that the different density of the solutions cannot be the cause, the toning bath varying so little from the plain washing water. I have tried, at one time or another, every plan I have seen suggested, sometimes with apparent benefit, and again without any. The device of Mr. Richmond of putting the *dry* prints directly out of the printing frames into a bath of methylated spirit has, each time I have tried it, had the desired effect; but, of course, it *might not* always answer. Fortunately, blisters are not of every-day occurrence. This plan *differs essentially* from Mr. Stuart's, who *tones his prints first*, before the spirit bath. It will not be until the cause of blisters is *definitely* known that a remedy, if possible, will be found for them; at present we work in the dark, and a cure one day is none another. The probability is they are from different causes, each of which requires separate and distinct treatment.—I am, yours, &c.,

December 29, 1891. EDWARD DUNMORE.

"A NEW DEPARTURE IN PHOTOGRAPHY."

To the EDITOR.

SIR,—We refer to an article on page 3 of the *Daily Chronicle* of 28th inst. as a striking example of what a farrago of nonsense (or worse) non-technical papers make of technical subjects. We enclose copy of our reply to the purely personal parts of the article, and ask you to be good enough to publish it in your columns.

The portions of the article not referred to in our reply are equally ludicrous to the expert reader, and are a delicious (though dangerous) compound of want of knowledge and a too evident desire to puff a friend's goods, which apparently stand in need of that adventitious aid.

If the writer of the article had been "content to puff" his friend's paper, we should have been silent, but when he goes out of his way, and, under the cloak of pretended ignorance, belittles our paper, we cannot refrain from exercising an Englishman's right to hit out from the shoulder.—We are, yours, &c., THE BRITANNIA WORKS COMPANY.

Ilford, London, December 29, 1891.

"A NEW DEPARTURE IN PHOTOGRAPHY.

"The Editor, *Daily Chronicle*.

"SIR,—With your kind permission we would question the accuracy, not only of the above title, but of several statements, made in your issue of yesterday, statements which are not only untrue, but unfair to us as manufacturers, who have won back from the Germans a branch of trade which threatened to leave us altogether.

"When your reviewer generalises on photographic methods, expatiates on the advantages of the photographic paper in question, or quotes trite facts, he is on safe ground; but when he goes on to express any original opinions, his words are open to question.

"On the point of permanency, for instance, he says, 'Absolute permanency cannot, in our opinion, be guaranteed to any print made from sensitive salt of silver.'

"Now, scientific opinion and absolute facts entirely controvert this suggestion. Captain Abney, Professor Burton, Mr. Chapman Jones, and Mr. C. H. Bothamley (the four best photographic scientists we have) have all stated explicitly that, given proper care in manipulation, gelatino-silver prints are practically permanent.

"These opinions of experts are amply corroborated by practical photographers, who for six years have been using this paper in their work; they affirm that 'they never saw a faded print on the paper.' Yet your reviewer says, 'The paper has not been tested by time.' He is either ignorant of well-known facts, or his too evident partiality for Mr. Blackie's paper blinds him to their existence.

"By the way, would it not have been nearer the truth to say that celerotype owes its origin to Mr. Woodbury himself?

"The review goes on to say that 'a fourth paper, the Ilford printing-out paper,' is not described by Mr. Woodbury. We may at once explain that the book under review describes only those papers whose manufacturers paid 5*l.* 5*s.* for advertisement space therein, and that we had no need of such a method of puffing our wares.

"The next statement to which we would take exception is the reference to price. The reviewer says: 'This (Ilford) paper is rather cheaper than the others.' Such a statement is a *suppressio veri*, too evidently intentional, as our paper is less than half the price of its predecessors.

"Of its comparative qualities we would prefer not to speak, it would not be becoming to laud our own wares.

"We are next told that our 'paper is little known.' Here, again, ignorance or partiality has influenced the reviewer; and, taking into account his subsequent laudation of celerotype, it seems probable that partiality is the motive.

"It is true that we have not advertised the paper either in Mr. Woodbury's book or in the photographic journals (and therein, perhaps, lies the cause of the attack on us). If sales, however, indicate popularity, we are more than satisfied; and, if we may be allowed to say so much, we would state that we have never been able to execute all the orders received, so great has been the demand.

"Photographers, professional and amateur alike, are, and have been, keenly alive to the great advantages of gelatino-chloride paper, which is no new thing, but has stood six years' test. The only clog on its wide-spread use has been the question of price; and, now that the photographic public have such a paper at a reasonable price, they have not been slow to avail themselves of it.

"They have taken it up at home here just as eagerly, and as successfully, as their brethren in the United States have taken up similar papers made there. To those who know the trade, the success of this class of paper is phenomenal, and this gives us one more point of disagreement with your reviewer, and leads us to predict with certainty that we have in this paper the printing process of the future.

"As the yearly consumption of albumenised paper totals up to several millions of pounds annually, and as all this sum is in the hands of the German manufacturers, we trust you will consider the question one worthy of a place in your columns.

"If Englishmen can replace this German-made albumenised paper, even to some small extent only, with English-made gelatine paper, England will be the gainer, and those manufacturers who effect this substitution deserve well at the hands of their fellows—photographic and otherwise.—We are, yours, &c.,

"*For the* BRITANNIA WORKS COMPANY, LIMITED,

"(*Signed*) JOHN HOWSON."

[We have referred to this subject elsewhere, and may here say that we treasure the *Chronicle* article as a curiosity of the reviewer's art. —ED.]

THE LANTERN EXPLOSIONS.

To the EDITOR.

SIR,—Mr. A. P. Okell, in his valuable remarks on the Ilkeston explosion is a little too severe on the lanternists who make their final preparations in the presence of an audience. I quite agree with him that no operator of taste and experience would ever do so (*if he could help it*). But what says experience? How often there is not time to finish before the doors are open. Last night I found myself thirty miles from London, the place a chapel, in which I had never shown before, the time before opening one-and-a-half hours, the arrangements for a lantern exhibition largely neglected, and almost everything to be done. Having made local arrangements, I had not taken my screen-frame, so as to minimise carriage, with the result, that the local bungle involved an hour's work in getting the screen fitted up, where, with my own frame, a quarter an hour would have done it. Naturally, by the time the lantern was in place and connexions made, the audience were doing a little concert outside, and the rest had to be done in their presence, to their increased enjoyment. It was sad, I know, and I felt it more than anybody else; but is not this a common case? If we could get into rooms as early as we liked, and have plenty of time for preparation, the public would have no share in the getting ready, to our own great comfort and ease in the after-working; but we have to do the best we can.

In Mr. Scattergood's case it should be remembered that all the arrangements, adjustments &c., had been made and tested the night before, and he had no reason to suppose that anything more was needed than just to light up and go ahead.

Censure the lantern men as much as you like for not being ready beforehand, but be just in the censure.—I am, yours, &c. ONE OF 'EM.

December 29, 1891.

MR. J. PATTISON GIBSON AT THE CAMERA CLUB.

To the EDITOR.

SIR,—Will you kindly allow me to state that the eighth of the series of "One Man" photographic exhibitions will be open at the Camera Club on and after Tuesday, January 5? The pictures will be by Mr. J. Pattison Gibson, of Hexham, by whom we shall be favoured with a representative collection of his photographs.

Visitors will be admitted from ten to four by tickets, which can be

obtained from the Hon. Secretary of the club, and from members. The exhibition will remain open about six weeks.—I am, yours, &c.,

Camera Club, Charing Cross-road, G. DAVISON, *Hon. Sec.*
December 24, 1891.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

W. A. MEIGH.—The broad side.

WALTON ADAMS.—We are much obliged to you. Kindly let us have the details.

BERNERD.—Place a piece of ruby glass in front of the lantern objective, and use a condenser.

COL. GUBBINS.—The Universal Adapter is, we believe, sold by Fallowfield, of Charing Cross-road, and other dealers.

J. C. S.—The address of Mr. J. A. Furnivel, the maker of the micro-projector, is 5, Kay-street, Ardwick-green, Manchester.

INFORMATION.—The prints are produced by the carbon process. Apply to any house which makes that process a speciality.

SOMERSET.—You do not give the quantity of pyro employed. State the complete formula, and we may be able to assist you.

LANCELET L. HASLOPE.—"Rodinal," which is sent out in a very high degree of concentration, would probably suit your purpose.

T. W. THORNTON.—Our special representative unfortunately disappointed us. Your letter came too late for us to do as you suggested.

F. BRYANT.—Apply a solution of mercuric chloride with a brush, and then blacken with ammonia. Other intensifiers may be used in the same way.

J. H. BALDOCK.—If the salts dissolve in hot alcohol, sensitise with a hot solution of silver nitrate, and the trouble will in all probability disappear.

E. LLOYD JONES, of Sale, near Manchester, wishes to know if there is a possibility of his hiring a lantern near Carmarthen, Haverfordwest, or Pembroke, for a lecture he is to give at Tenby.

R. MC. F. M. writes: "Regarding the lantern accident of Mr. Scattergood's, I will simply call your attention to your issue of February 18, 1870, page 81. Perhaps it may shed some light on this much-debated subject.

E. BLAKE.—Excellent enlargements on bromide paper may be, and are constantly being, made with a lantern having only a paraffin oil lamp. We refer you to the advertisement columns of the JOURNAL and ALMANAC.

A. MUNDT writes: "I am desirous of getting an American weekly publication in connexion with the lithographic and collotype trades, and I would be obliged if anybody could name one, with the publisher's name and address."

A. Z.—The cause of the frilling was that the developing and fixing solutions were made too warm. Although in exceedingly cold weather it is advantageous to warm the solutions, they should not be made of a higher temperature than they are when working under ordinary conditions.

PUCK.—Scenes on the stage, with the actors, have been photographed over and over again. "Snap shots" with a detective camera with a lens working at *f*-11 are, however, not likely to be a successful, unless the light be *exceptionally* brilliant, and the plates *exceedingly* rapid, and specially sensitised for the yellow rays.

W. C. asks how, as it is said not to be safe to use gauges, one is to know, when he has his cylinder filled with oxygen, that he gets full measure?—If he cannot trust those who supply the gas, he has a check by weighing the cylinder. By its weight the approximate quantity of the gas it contains can be ascertained.

R. A. W. complains that his studio windows are continually being broken maliciously by, he suspects, one of his neighbour's boys, though he cannot detect the delinquent. He asks how we should advise him to act?—We should see the superintendent of police in the district, and state his suspicions, and the reasons for them. The annoyance will then probably cease.

ALEX. MCC.—For photo-lithography, gelatine negatives are not so suitable as those by wet collodion. It is a *sine qua non* that the lines are represented by clear glass without veil. This is rarely the case with dry plates, except those supplied by one or two firms, specially made for photo-mechanical work. Messrs. Mawson & Swan and the Autotype Company supply such plates.

DOUGLAS M'NEILL.—If you copy a single picture by a binocular camera the result will not be stereoscopic, but it is possible to trim two similar pictures and so mount them that when viewed in the stereoscope they shall appear as if they stood quite outside of the mount. The principles of this will be found described in the editorial article of our ALMANAC for 1887, to which we refer you.

H. D. BERTALT.—The discrepancy in the measurement of the iris diaphragm arises from the values of the apertures being engraved on the mount without each lens being carefully measured. The difference may not have existed in the case of the lens which formed the sample given to the engraver, but a difference in the density, and consequently in the curves of the others which were placed in the previously engraved mounts, will account for the discrepancy.

C. WILKINS.—The mere fact that the view has been photographed before, and the photograph made copyright, does not prevent you, or any one else, from photographing it again, even from exactly the same spot. The copyright is in the photograph, and not in the scene.

W. W. RANDALL writes:—"When a pyro-developed plate is not *thoroughly* washed, and is then put into the alum bath, it will often show a flash of phosphorescence, lasting sometimes for a second. It always occurs to me when I do not wash plate *well*. A friend of mine also has the same experience. The place where the alum tray is set must be rather dark, otherwise the phenomenon cannot be seen. Can any of your readers tell me the reason thereof?"

T. BEDWELL asks if the methylated spirit now being sold under the new Excise regulations is suitable for making collodion with for enamelling silver prints, and whether the mineral naphtha is likely to act injuriously on the photographs?—We should imagine that the spirit would answer quite well, though we have not actually tried it for this particular purpose. It would be very unlikely that the presence of such a minute quantity of mineral spirit would have any influence on the permanence of the print.

S. B. E. says some years ago he was "shown a portrait, or, rather, two portraits, of a man playing chess with himself—that is, the same man was seated on either side of the table, apparently playing the game, and there was no appearance of joining or masking in of the second figure, it was so neatly done." He wishes to know how it was accomplished.—Such pictures were very common many years ago, and are easily taken. Apparatus for the purpose is described by Mr. T. Gulliver on page 655 of the ALMANAC.

AMATEUR (N. W.) asks how to prepare a background in "size colour," of an even slate colour, such as those often seen in professional studios?—Mix lampblack and whiting together in water into a thin paste, to the colour desired. Then add sufficient hot "patent size" to form a tremulous jelly when cold. Apply in this state with a whitewash brush. As the colour dries of a different tint from what it appears when wet, it is a good plan to apply a little to one corner first, and allow it to dry, in order to see that it is right before going over the whole, or the work may possibly have to be done a second time.

G. E. S. writes: 1. Can you recommend me a good mountant for fixing bromide prints to mounts which I want to have bound eventually into an album. I have tried starch, which is nice and clean, but the mounts "buckle" so much in drying that it seems doubtful to my mind if that is the best thing to use. I may add, that mounting on both sides of the card does not counteract the evil. 2. Do you think, in a collection of views of a single district, that mounting on both sides of the mount detracts from the interest and character of the work, or would you advise mounting on one side only? 3. Can you tell me anything about Watkin's exposure meter? Is its action simple and reliable, and quickly ready? Is the instrument for copying and enlarging also available for landscape negative work? 4. I should like to see a model design for an amateur's dark room to work, say, 12×10. Has this ever been published?—1. Starch is as good as anything. A solution of gelatine, in which alcohol is made to take the place of part of the water, is excellent for avoiding cockling. As the prints have to be bound into a volume, would it not be better to let the binder do the mounting, in which line he is experienced? 2. Usually such pictures are mounted on one side of the mount only. 3. Yes. 4. Several designs have appeared in back volumes of the JOURNAL and the ALMANAC, but most amateurs prefer to design, and fit their own dark rooms, according to their individual tastes and requirements.

PHOTOGRAPHIC CLUB.—January 6, *The Various Applications of Film Negatives.* 13, *Glass amongst the Ancients.*

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—January 4, Beginners' Night; *Paper and Demonstration on Developing*, Mr. F. W. Webb.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—January 7, a paper on *Some Recent Exhibitions*, P. H. Newman. Visitors invited.

NORTH LONDON PHOTOGRAPHIC SOCIETY, Wellington Hall, Islington.—Tuesday, January 5, at a quarter past eight, Technical Night. Visitors are invited.

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB (PHOTOGRAPHIC SECTION).—1892: Friday, January 1, *Apparatus and Backing Plates*, W. R. Baker. 8, *Further Hints on Toning Bromide Prints*, John Weir Brown. 15, Extra Lantern Night. 22, *Hand Camera Work*, J. Sinclair. 29, Lantern Night. February 5, *Bromide Enlarging*, J. H. Baldock, F.C.S. 12, *Diazotype*, A. G. Green. 19, Extra Lantern Night, American slides. 26, Lantern Night, members' slides. March 4, *Pictorial Composition*, J. Henry Drage. 11, *Aristotype and Platinum Printing*, D. E. Goddard, F.R.M.S. 18, General Meeting. 25, Last Lantern Night, members' slides.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1653. Vol. XXXIX.—JANUARY 8, 1892.

A FALLACY IN CONNEXION WITH THE CURTAILMENT OF EXPOSURE.

From the earliest days of photography expedients have been attempted and methods put forward for the purpose of shortening the camera exposure; but, so far as we are aware, not one of them has proved a success, or established a just claim to have effected what was intended. Auxiliary exposure, that is to say, the submission of the plate before or after its exposure in the camera to the action of very feeble light, with or without the interposition of coloured screens, has at various times found supporters even amongst practical men, and has formed the subject of at least one patent; but, though under certain circumstances an apparent advantage may seem to be gained, the effect may be, perhaps, best described by the term applied to it, "judicious fogging," though with some doubt upon the adjective.

Some few years ago Mr. W. K. Burton and Mr. W. E. Debenham exploded the idea of the utility of auxiliary exposure by means of sensitometer experiments, which showed that though a gelatine plate, that had been exposed to a light so feeble as not to produce visible fog, might show one, or, perhaps, two higher figures on the sensitometer than without the preliminary exposure, they possessed no printing value, and the effect was so slight as to make no practical difference in the sensitiveness of the film. It is just possible that in the case of subjects comprising masses of heavy shadow this preliminary fogging may render visible in the negative a certain amount of feeble detail not otherwise obtainable, and this is the class of example invariably selected, in conjunction with a brief exposure, by promoters of the various processes to which we have alluded; but there it ended, for, though a negative of black velvet drapery might by the aid of auxiliary lighting show more detail than one exposed in the ordinary way for the same time, there would be little, if any, difference on the prints; and where the same amount of detail was produced by a shorter exposure the printing result would be inferior.

Auxiliary lighting was, in fact, only intended to help out very short exposures, especially in portraiture, when our films were much less rapid than they are now, and it was scarcely, we believe, claimed to have any value in materially shortening the time of exposure under normal conditions. The fallacy we now propose to expose is of a different character, and is supposed to be of use in cases where abnormally long exposures are requisite, as, for instance, in photographing interiors where the incipient fog set up by the other methods would under any circumstances be useless. It consists in making a portion of the exposure with a comparatively small stop, and the remainder with a larger or the full aperture of the lens.

The idea is that, by using the small stop for a portion of the time, definition is secured and indelibly fixed upon the plate, and that what is wanting in the way of light, to complete the details of the picture, may be supplied by a flood of light for a short period through the full aperture of the lens. But this supposition overlooks the fact that the sharp image obtained by the partial exposure with the stop is too feeble to stand alone, or to assert itself in opposition to the blurred image given by the full aperture, unless, indeed, the proportion of light that reaches the plate through the stop is much in excess of the full aperture, in which case the advantage is not very palpable. Moreover, the method is only practicable to any extent when using a lens of the rapid rectilinear type, and these are not invariably applicable in the case of interiors. With lenses of the wide-angle type, such as the portable symmetrical, there is no necessity for stopping down unless a very wide angle has to be included; and, as the largest working aperture of such instruments gives very satisfactory definition over a considerable area, it will generally be used where at all possible. Even where a smaller stop *must* be used, the difference between it and the full aperture is not great enough to offer any advantage in the use of the latter during a portion of the exposure.

It is true that, under some circumstances, when using a rapid rectilinear, a curtailment of the exposure may be effected in this manner without serious loss of definition, as, for instance, when photographing some object that covers but a narrow angle or a portion only of the plate. Take, for example, a monument or piece of statuary in a dimly lighted edifice, where the surrounding objects are of no importance. Then the full aperture may be used, but it would be preferable to use it entirely, since the construction of the lens enables it to satisfactorily cover the requisite angle; but, where it is necessary to cover the full-sized plate for which the lens is intended definition to the edges can only be obtained by the use of a stop.

The hollowness of the fallacy can be proved by a reference to figures, and we shall detail an experiment that will, we think, make our contention clear, that nothing is to be gained, but rather the contrary, by the adoption of the piecemeal method of working with different apertures. The exposures, it will be understood, are not intended to represent such as would be given for interiors; but, increased proportionately, the principle and result would be the same.

As a starting point, a sheet of printed matter was focussed with a rapid rectilinear lens giving a very flat field, using the stop No. 32 of the Society's standard or f·22·625, under conditions that made an exposure of sixteen seconds about correct, though absolute accuracy in this case was immaterial, as the equivalent exposure can be arrived at mathematically, the object of the experiment being confined to a comparison of the different degrees of definition. In this instance, the definition

was extremely good over the whole plate, which included an angle of about 45°. The next exposure was made partly with the same stop and the remainder with the full-working aperture of *f*-8 or the 4US, the actual light reaching the plate being equally divided between the two, or, in other words, each aperture had similar work thrown upon it. This required an exposure of eight seconds with No. 32 stop, and one second with No. 4, or a total exposure of nine seconds, representing the same effective action of light as the previous one.

But, when examined for definition, the falling off was lamentable, taking into consideration the character of the lens, for, though over a small central area it was as perfect as in the first plate, the loss of sharpness towards the edges was very great. The influence of the small stop was nowhere apparent, so completely masked was it by the action of the fuller aperture, and the result was little, if any, better than if the latter alone had been employed. This will not appear so surprising if it be considered that the larger aperture is free to impress its blurred image on top of the finer definition given by the stop, while the latter is incapable of undoing the work of the other—of, in fact, rendering coarse lines fine when once formed. Such would be possible if the effective exposure given by the stop preponderated considerably over the other; but here they are equal. If such preponderance were allowed, then the gain in time would disappear. Thus, if the relative work thrown on to the two apertures were to be as 3 : 1, the larger share being given to the stop, we have actual exposures of twelve seconds with No. 32, and half a second with No. 4, or a total of twelve and a half as against sixteen seconds with the former alone. But, even with this slight gain, the counterbalancing loss of definition was very considerable.

By calculation we next arrived at the size of stop with which a single exposure would give the same amount of effective light in nine seconds, the time required by the two apertures we have already mentioned, when doing the work equally. This was found to be *f*-17, equivalent to the 18 of the standard series, and a picture taken with this diaphragm as accurately as we could make it, proved almost as satisfactory in point of definition as that produced by No. 32, though, of course, not actually so crisp at the edges. Going a step further, and taking the stop that represents the full working aperture of the series of portable symmetricals, lenses which, as every one knows, work admirably with full apertures over the angle we are working, the definition was scarcely different from the previous exposure, in fact was, for all intents and purposes, perfect, and the exposure was just half of the first one with No. 32 stop, and a little less than two-thirds of that with the work divided equally between that stop and full aperture. One other instance, and we have, we think, proved our case. If the stop *f*-20 be substituted for *f*-22·625 and an exposure of twelve and a half seconds given, a picture showing almost equally good definition will be obtained, and in precisely the same time as when one-fourth of the work is done with full aperture and the definition ruined.

Instances might be multiplied without limit to show that no combination of stops used in the manner described is capable of shortening exposure to any extent without a more than proportionate loss of definition; in fact, the first attempt we made in equally apportioning the work between Nos. 4 and 32, though chosen hap-hazard, as a start, is perhaps the best that could be made. But the definition is inferior to that given by No. 8 (*f*-11·31), with an exposure of four seconds, as against 9.

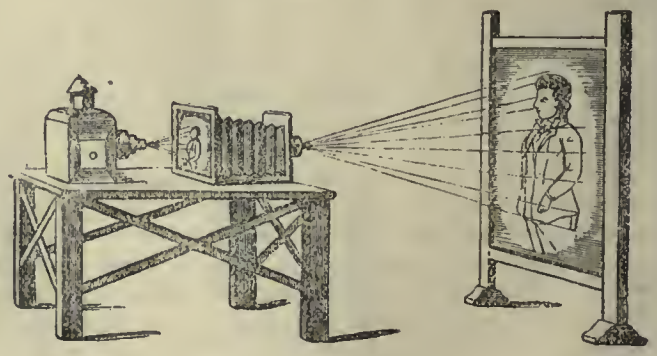
The rapid rectilinear is not a lens that can be used for wide-angle work, otherwise the comparative results would be, perhaps, worse, while the wide-angle lenses, if they afforded facilities for such dodging, do not require it, as they may be used with satisfactory results with full aperture, or nearly so. But the moral is, Give a straight-away exposure with the largest aperture the lens will permit, and the best result wil be obtained.

A SIMPLE ENLARGING ARRANGEMENT.

At a time when enlarging is practised by amateurs to an extent never previously known, it is well that we point out one among several things which may conduce to failure in obtaining the best results. In order to do this, we select as a text on which to hang a few hints the following letter from Colonel Senior, which recently appeared in our Eastern contemporary, the *Journal of the Photographic Society of India*. It is headed "A Simple Enlarging Arrangement:"—

"Supposing an amateur wishes to obtain a bromide enlargement from a half-plate or any other larger-size negative, and has no time to do it by daylight, but has a magic-lantern with a three or four-inch condenser, which, however, is not large enough to enable him to enlarge by the light of the lantern, he may get over the difficulty by using the following simple arrangement:—

"Place the magic-lantern near enough so as to throw a disc of about eight to twelve inches, or more, according to the size of the negative in diameter, on a piece of ground glass placed in front of the negative fixed into the back of the camera, thus throwing a circle of condensed light, which equally illuminates all parts of the negative, and enables the lens in the front of the camera to enlarge the image in the usual manner, thus:—



"If the lantern or room reflects light so as to injure the enlargement, the back part of the camera and magic-lantern should be screened off."

Where the method described by Colonel Senior is defective lies in the fact that the illumination of the negative is good only in and near to the centre, the light becoming so weak as it approaches the margins as to necessitate an exposure many times greater than suffices for the centre. A plate of ground glass is unable to radiate light which falls upon its margins at an angle of such obliquity as that projected from the nozzle of a lantern as shown in the drawing. Without such a ground-glass backing no light whatever would be transmitted through the negative to the enlarging lens but what passed axially or through the centre, while with two or three such plates there would be a greater approach to evenness of lighting at the expense of central darkness.

To rectify this, and assuming that it is requisite that rays of light pass from the lamp throughthe negative in a line as

nearly direct to the lens as possible, the best way would be to place a large lens, one equal in dimensions to the negative, in juxtaposition with it, this lens being of such focus as to condense all the light upon the object-glass or enlarging lens. But this implies the possession of a large condenser, which is not supposed to be on hand at the time.

A good and simple way to get a negative—say, one of half-plate size—well illuminated for either enlarging or reduction, and one by which we have often made lantern transparencies from 8 × 5 negatives, is to discard altogether the lantern shown in Colonel Senior's method, and illuminate the negative by two lamps alone without any condenser at all. As in his system, a ground glass must be placed outside the negative; but the lamps, two in number, must be directed on the ground glass in such a manner as to point to the object-glass, or enlarging lens, the line of direction of the flame being through a portion of the negative about half way between the centre and the margin. The letter < (placed on its side) represents the angle at which the two lamps should be placed, the apex being the lens.

METHYL ALCOHOL *VERSUS* THE NEW SPIRIT.

A CORRESPONDENT this week sends us a suggestion that is worth the consideration of those who are compelled to use methylated spirit, and who distrust the new preparation that has now come into use. It is to employ, in place of it, methyl alcohol, which, in its commercial form of wood naphtha, serves perfectly well most of the purposes for which ordinary alcohol is employed, and which, until now, has been the only addition made in methylating. Its odour is not particularly agreeable to some tastes; but, that little prejudice being overcome, it is consolatory to know that it is readily obtainable, without Excise restrictions, in a sufficiently pure state for most purposes, and at a price not much above that of methylated spirit.

Our correspondent writes chiefly from the point of view of a collodion-worker, and, perhaps, overlooks some of the uses of methylated alcohol beyond his particular boundary, though we are not aware of any special objection to the proposed substitution. Methyl alcohol is perfectly mixable with water, and should therefore be equally available for use in connexion with gelatine emulsion, or in the manufacture of gelatine mounting media. But we are not so sure about its utility for such purposes as the rapid drying of plates, and similar uses, where the strong affinity of alcohol for water rendered it so valuable.

For varnish-making, and as a solvent of the various resins and gum resins, as well as volatile oils, it is every whit as good as alcohol, except for its smell, which, by the way, belongs only to the crude wood spirit, or naphtha of commerce, and not to pure methyl alcohol. It answers perfectly, also, for collodion-making, for which purpose it is considered by some to have advantages over ordinary alcohol. It is, indeed, a perfect solvent of good gun-cotton, without the assistance of ether, and as such was put forward in a suggestive way some years ago.

Though we have not ourselves succeeded in securing a commercial sample that acted as a perfect solvent of pyroxyline by itself, we know it to be at least a partial solvent; but, when combined with a small proportion of ether, its solvent powers become perfect, and the result is a collodion possessing great fluidity and less structure than is usual with ordinary alcohol.

For emulsion purposes it answers well, though it is apt to give a too fluid and slowly setting emulsion, and the "suspending power" of collodion made with it is scarcely equal to that in which ordinary alcohol is employed. This failing is, however, easily remedied by increasing the proportion of pyroxyline; but this, again, constitutes an additional expense.

Though we have used the crude wood naphtha successfully for making emulsion, we should scarcely recommend the practice unless a fairly clean sample is obtainable with certainty. Without, however, going to the expense of the perfectly pure article, which is as costly as ordinary alcohol, a sample of pyroxylic spirit, purified for medicinal purposes, is obtainable at about a couple of shillings the pound.

At any rate, should the new spirit prove objectionable for any of the above purposes, our readers can but try wood spirit.

Fading of Bromide Prints.—The vexed subject of the permanency of silver—and in particular silver bromide—prints came under discussion at the last meeting of the London and Provincial Photographic Association, and formed the theme of some instructive and enlightening remarks by Mr. T. Bolas, which will be found elsewhere. According to his theory, which we may confess strikes us as an extremely feasible one, the fading of bromide prints in a damp atmosphere is due to the presence of sulphate of lime in the paper upon which the prints are made. Under the influence of moisture this substance reacts to form sulphide of calcium, which, in its turn, is converted to hydrogen sulphide. This changes the metallic silver to the state of sulphide, and is itself again resolved into sulphate, and yet once more into sulphide, and so on. As there is not sufficient silver sulphide formed to give a dense image in that compound, the fading of the picture, on this hypothesis, is easily accounted for.

Uranium Residues.—Few photographic societies that we are acquainted with can boast of such a large number of practical and theoretical photographers, able and willing to grapple with the numerous problems that are constantly being brought to light in the progress of photography, as the one just named. Conspicuous among these is Mr. A. Haddon, upon whose *dicta*, as we have before remarked, not only ourselves, but most photographers, look with a great deal of respect. At the meeting above alluded to, Mr. Haddon suggested that, in uranium toning, the spent solution was unnecessarily wasted, inasmuch as, by adding a solution of potassium ferrocyanide thereto, the unemployed uranium could be recovered in the form of ferrocyanide. Mr. Haddon promised, at a future meeting, to give a method whereby the uranium ferrocyanide so obtained may be converted to nitrate. Uranium salts as he remarked, are likely to be employed to a great extent in the near future, and the information he promises will therefore be of much value to many. Experimentalists of the stamp of Mr. Haddon deserve the thanks of the photographic brotherhood.

Coloured Liquids as Light Screens.—The use of various coloured liquids as light screens for the dark room, though, perhaps, the most useful of any light-modifier, is practically inadmissible, owing to the difficulty of obtaining, without great trouble, a convenient receptacle for containing them. There has, however, lately been introduced a series of vessels which, if of sufficient size and not too costly, ought to be just the thing wanted. In a German technical journal a description of the new receptacles is given. They consist of cells with flat sides, made of uniform thickness, and free from bubbles or waviness.

Luminous Flames.—The structure of luminous flames has given rise to many discussions for years past, and at a recent meeting of the Chemical Society a paper was read on the subject. After passing in review the various theories hitherto advanced, the author, Mr. Arthur Smithells, B.Sc., gives what he considers to be a true description of a luminous flame, which it is unnecessary for us here to repeat. But it would not appear difficult, with the aid of orthochromatic plates, to make exact and precise illustrations of the various points of importance by means of photography. Full descriptions of each print could then be given, and a reference made to

the particular photograph illustrating it. Even if the photographs failed to give the luminosity in its true value, the various "sheaths" and forms produced under different conditions could be reproduced in a manner quite sufficient for the argument.

A Simple Flash Lamp, and a Dark-room Lamp.—In the *Scientific American* Mr. George M. Hopkins, under the title of "Suggestions in Photography," brings forward some neat and inexpensive modes of constructing sundry apparatus for photographic workers. There is a magnesium flash lamp. It consists simply of a block of wood, upon which is placed a small tin pan, like an old canister lid. A piece of asbestos is fixed to a wire hasp, worked by a piece of string. The asbestos is charged with spirit, lighted, and, by a pull of the twine, made to dip into and ignite the magnesium powder, which, of course, has to be mixed after some pyrotechnic fashion. He pictures a pasteboard blank with dotted lines, showing where to bend it to make a developing tray. The corners are to be fastened with glue and cloth, and the whole paraffined when completed. Perhaps the neatest piece of apparatus he describes is a portable dark-room lamp. It consists of a two-candle-power incandescent lamp, attached to a handle, and enclosed in a hemispherical reflector, closed at the front with a disc of ruby glass. The lamp is held near the plate. All the light is thrown downwards, so that the eyes receive no light, and are thus free from glare, which prevents due and clear perception of objects. Further, a small portion only of the plate receives light at any time; and, when the lamp is not in use, it can be laid, face down, on the table, or suspended so as to illuminate the dark room.

Another Marvel in Photography.—According to the *Echo*, Captain Colson, of the French *Génie*, has succeeded in photographing without a lens. The apparatus used by the Captain is described as "a simple camera into which the light is admitted by a pinhole." Specimens illustrating the practicability of the method, it is stated, were presented to the Conservatoire des Arts et Métiers one day last week. Our contemporary adds, by way of comment on this important discovery, "Photography has by no means exhausted its stock of marvels, which are revealed one by one to a wondering world." What an interminable mess the non-technical press seem to get into when they touch upon technical matters!

The Vatican Equatorial.—The large equatorial recently installed in the Observatory at the Vatican is under the charge of Father Denza, who is now at work taking photographs in connexion with the universal mapping out of the heavens. One by one the different observatories are getting this gigantic work in hand.

Sketching in Court.—Mr. Justice Denman administered a severe rebuke to some members of the junior Bar whom he noticed making sketches of the witnesses during the trial of the now famous "Pearl Case." Portraits of witnesses in notable cases are required by the regular illustrated papers, and by others who treat their readers occasionally with portraits when a highly sensational case is on. Hitherto we imagined that these were sketched by artists engaged for the purpose, from that portion of the court set apart for the press or the public, and not from that retained for Counsel. Be that as it may, the majority of the portraits which appear, are little better than caricatures of the individuals depicted, and reflect very little credit on those who make them, whoever they may be. Unfortunately, or fortunately, our law courts are too badly lighted to permit of the use of detective cameras, or undoubtedly they would, long ere this, have been pressed into service for obtaining surreptitious portraits of those who are often reluctantly compelled to appear in sensational cases.

Photographing Scenes of Accidents.—We have frequently alluded to the great service photography might render in the cases of accidents or catastrophes, if the scene were photographed before anything was disturbed. By this means, often, a more correct idea could be formed as to the cause than any amount of verbal evidence. In the case of the late explosion at Dublin Castle, we are given to understand, as soon as the excitement, consequent upon it, had somewhat subsided, the authorities had the scene photographed.

Pastel Portraits Once More.—*Trade, Finance, and Recreation*, which is treating its readers to a series of articles on "Roads to Easy Fortune," deals, last week, pretty roughly with the "Pastel Portrait Business." Although this affair, or affairs, has been exposed time after time, and in spite of legal proceedings, it appears, according to our contemporary, to be still flourishing, and recommending its "No. 614" as the most suitable frame for the two guinea free portrait. Something for nothing will always be a good bait for the gullible.

Patents in 1891.—The number of patents applied for during the year just ended was over fifteen hundred more than in the year before, which was much in excess of any previous one. Last year the actual number was twenty-two thousand eight hundred and seventy-two. As yet the numbers are not classified, but, to judge from the lists that have appeared weekly in our columns, the applications in connexion with photography will show a considerable increase over all previous years. What a marked difference there is in the number of applications for photographic patents now and in former times! Going back, say, twenty years—that is, 1871—we find the total number of patents, directly and indirectly connected with photography applied for, was only twelve for the whole year, a few more than are sometimes applied for in a single week now. Are photographic inventors more mercenary now than they were formerly? It would certainly seem so. Now, any little improvement or modification appears to be made the subject of patents. In former days it used to be freely given away, and this was the case with all the most valuable inventions in connexion with the art.

Bromides for Platinotypes.—A provincial photographer says he is told that it is very general with London houses, when platinotypes are ordered, to supply bromide prints instead when the light is bad for printing. He adds that one of his customers showed him some portraits sent out as platinotypes that he feels convinced were bromide prints, though they were very good. The object of our correspondent's letter was to inquire if, in such cases, the Trade Marks Act would not apply? That some photographers may sometimes supply bromide for platinum prints is quite possible, but that the practice is at all general we do not for a moment believe. It is a pity that the writer did not satisfy himself as to the genuineness or otherwise of the prints he suspected. This he could have conclusively done by simply immersing one of them in a solution of bichloride of mercury, which would quickly bleach a silver image, while it would have no effect on a platinum one. Undoubtedly the Trade Marks Act is infringed, and a penalty incurred, if silver prints are sold for platinotypes.

Purity of Water.—As the purity of water is always a subject of importance to photographers, we draw the attention of our readers to an address delivered by Professor Leeds before the Chamber of Commerce of Rochester, New York, which is printed at length in the *Chemical News* for January 1. One leading point in it we may here allude to. We have heard the presence of bacteria in water held accountable for many sins of omission and commission on the part of the operator, from blisters and bad toning in prints to fogginess in dry plates—which latter, by the bye, might easily be caused by bacteria setting up decomposition in the emulsion before washing. The point, however, we wish to draw attention to in Professor Leeds' paper is his observation, which has thoroughly been reduced to practice, that a water which is opalescent or unclear-looking after filtration may be made perfectly clear and bright by the addition, before filtering, of so small a quantity of alum as one quarter of a grain to the gallon. This has a marvellous effect in producing a bright and limpid water, and it assists in arresting almost all the microbes present.

A PLEA FOR FAIR PRICES.

For the past ten years the prices charged by photographers for their work have had a downward tendency, and where a guinea a dozen was at one time easily obtained for vignette *cartes* or Berlin heads, half that price is about the present average. It seems to me that the profession have been themselves to blame for this wholesale lowering of prices, and there is little doubt that they are now suffering for it. A few years back the proprietor of a moderately quiet business, taking some twenty-five sitters a week, could make a comfortable living for himself and family: with the reduction of prices he undoubtedly thought there would be an increased business, and a proportionately increased income, but he now finds that, with about the same number of sitters per diem as he then had per week, his income, after deducting working expenses, is less than it was before! The main cause of this lies in the fact that, in order to get through the increased work, he has not only had to take larger premises, but to employ a much larger staff. Then, again, competition has become much keener than it was, and many a town which then only contained one photographic studio has now several to support. I could name many a town as proofs, but let two suffice. One in the eastern counties, of between 20,000 and 30,000 inhabitants, had, at the time I speak of, three photographers therein plying their calling; now it contains no less than ten or eleven. Another, in the western district, had two where now six are to be found. At fair prices, each of these studios would bring in a respectable income to its proprietors; but, what with the cutting down of prices and the amateur competition (save the mark!), they can only barely exist, and some must, in the end, go to the wall. The sufferers will, in most cases, be those who try to run between the extremes of high and low prices. The best class of sitters will continue to patronise those whose charges are the highest; while the middle and lower classes will go in for the cheapest goods they can obtain, leaving very few patrons indeed for the medium-price man.

There is one branch of the profession which I had fondly hoped would maintain its character and continue fairly remunerative. The branch to which I refer includes enlargements and coloured work; but even there the price-cutter is at work, and I was disgusted only a few days since at seeing a twelve-ten opal nicely worked in monochrome and tastefully framed, exhibited as "*Our twenty-five shilling enlargement.*" This must leave a very small margin of profit indeed, and is decidedly a step in the wrong direction. Those sitters who require, or whom we can make believe they require, enlargements will pay two guineas or even three just as readily as twenty-five shillings, and I fail to see why we should rob not only ourselves of a little extra profit, but also cut down the remuneration of the enlarger, the artist, and the framemaker for no purpose whatever, unless it is to cause other photographers to do the same.

Possibly another cause for the reduction in price of enlargements is to be found in the fact that some of the trade enlargers have been and are doing enlargements for amateurs and the general public at the same prices as if for the profession; this is manifestly unfair to the photographers who have supported them hitherto, and demands strong concerted action on their part. Perhaps the best thing would be to "boycott" any firm found working for the public at professional prices; if they like to supply the public at fair prices, as charged by the photographers, it would merely be fair competition, but undersselling cannot be tolerated at any price. I have an idea that, if several professional photographers were to form a syndicate for the purpose of enlarging and working up enlargements, it would be found a paying concern. They themselves would not only get their work well done at moderate prices, but would share any profits among themselves, added to which many other members of the profession, not necessarily members of the syndicate, would send their work to them to be done and pay a fair rate. Perhaps this hint may bear fruit in the near future.

C. Brangwin Barnes.

CONTINENTAL NOTES AND NEWS.

Testing for Hypo.—"If you want to know," says M. E. Caputo, of Naples, "whether the wash water of your negatives or prints still contains hypo or not, drop a little of 'this rose-coloured liquid' into the water. If the water is coloured thereby, no hypo is present; if, on the other hand, the water goes colourless, continue the washing." Very good; but what *is* the "rose-coloured liquid, Monsieur—or rather Signor—Caputo, please?

Incandescent Platinum Light.—In the *Comptes Rendus*, M. Paquelin describes an incandescent platinum light of his own devising. A strip of platinum coiled on itself is placed in a platinum bowl with a hollow stem. A mixture of air and hydrogen carbon vapour is then introduced under pressure. The mixture is set alight, the flame disappears, and the strip of platinum incandesces, the intensity being in the ratio of the pressure. With moderate pressure, the light is said to be comparable to that of an electric lamp.

Dinner to M. Jannsen.—A body termed the "Scientia," apparently a kind of Parisian science club of a somewhat exclusive character, "dined" Mr. Jannsen, the astronomer, on Christmas Eve, in recognition of his eminence and achievements as a man of science. Some of his predecessors in the honour are Pasteur, Renan, de Quatrefages, Jules Simon, Chevreul, Leon Say, de Lesseps, Eiffel, &c. M. Gaston Tissandier presided. "Giving a man a dinner" when he has done, or is going to do, something has hitherto been looked upon as a purely British custom. Apparently it is not.

French Photographic Papers.—During the year 1891 French photographic papers have increased to a large extent upon preceding years, some fourteen publications devoted to photography being now published, while others are in contemplation. If all are read, says our *confrère* of the *Moniteur*, so much the better, and we echo the sentiment. "Press buttons," however, according to the same authority, do not read photographic papers; with them photography is purely automatic throughout. They require to read nothing except the "directions on the box." Such as these could not understand what was printed in a photographic paper.

A Ladies' Photographic Club.—There is talk of the formation in London of a photographic club to which ladies are to be admitted. The club will comprise reception-rooms, laboratories, a library, and will be furnished with the utmost possible comfort. Besides ladies residing in London, the club will admit country members, who would be desirous of finding a temporary photographic home when passing through the metropolis. They say other people always know more about you than you do yourself, and this, we think, is a case in point. The information comes to us all the way from Vienna. We have not heard anything about it in London. It reads too rich to be true.

French Patents.—According to an account of the photographic patents taken out in France since the introduction of photography, it appears that the first patent applied for was in 1839, for a camera. In 1840 there were two patents taken out. From 1844 to 1860, the number of patents for apparatus, on account of more liberal laws, increased very largely, the latter year recording forty-one. In 1871 (the great war year) the number dropped to four. In 1890 it ascended to seventy-two. The chemical patents were, of course, much smaller, and the total number, looked at from every point of view, compares most unfavourably with that of British patents. Perfidious Albion simply "loses" in Belle France, in this respect at any rate.

Relics of Primeval Photography.—Happy Société Française de Photographie! At the meeting on December 4 last, M. Davanne presented a veritable camera negative obtained by Nicéphore Niepce, "the inventor of photography," accompanied by a letter written by Niepce himself. At the same meeting M. Forest also presented a Daguerreotype view of the village of Bry-sur-Marne, taken by Daguerre, and duly authenticated. In years to come these relics will be of inestimable value, and, the greater number of them that come into the hands of public bodies like the Société Française, the greater their chance of ultimate preservation. Private individuals are, for obvious reasons, the worst custodians of these treasures.

Magic Photographs.—Metaphorically speaking, we rub our eyes at beholding in one of our Parisian contemporaries a full, true, and particular account of how to make magic photographs. Several of its readers, it seems, had asked how these pictures were done, and the journal quotes the method from *Les Récréations Scientifiques* of MM. Bergeret et Drouin. Who *are* MM. Bergeret et Drouin that

they should be held up to us as authorities on this momentous point? Then the journal in question goes on to gravely tell the world how to bleach prints with mercuric chloride, and blacken them with sulphite or hyposulphite of soda, and winds up with the information that such is the "secret" of magic photographs. Shade of Scott Archer—thy "secret" in the keeping of MM. Bergeret et Drouin! What next?

Eikonogen-Pyro Development.—The *Deutsche Photographische Zeitung* recommends, where any difficulty is experienced in getting sufficient density with an eikonogen developer, to add a solution of pyro to the solution, and proceeds to give formulæ for the purpose. If there is one property of the photographic negative more than any other which it is desirable to have completely under control, it is that of density. Without it the finest detail, the most delicate half-tones, and the completest absence of veil from lights and shadows are of secondary importance. There is a touch of the irony of fate in the necessity experienced or even suggested that pyro's rival, eikonogen, should sometimes require its assistance to finish its work for it. Pyro still holds the field as an all-round developing agent, from which no one of its homologues or congeners will ever probably dislodge it.

A NEW TELESCOPIC PHOTOGRAPHIC LENS.

(JOURNAL OF THE CAMERA CLUB.)

THE object I have in view, in the lens-construction to which I invite your attention to-night, has been to produce large primary images, of sufficient brilliancy to be of practical value in rapid photography; there are also other advantages, to which I shall refer later on.

Hitherto only two methods of accomplishing the end in view have been employed to produce large images: first, the employment of very long-focus positive ordinary lenses; and, second, the production of a primary image by one positive lens, and placing a secondary magnifier, or second positive lens, behind the plane of the primary image, which enlarges it more or less, according to its focal length, and its adjustment between the positions of the planes of the primary image and that of the focussing screen, as in the photo-heliograph, &c.

The first of the older methods has been seldom employed, except in astronomical photography, on account of its unwieldy dimensions, and the second method referred to is practically useless for ordinary photographic work, on account of the great loss of light involved, rendering the length of time necessary for proper exposures so great as to cause it to be almost prohibitive, except for inanimate objects.

The new lens, as you are already aware, is composed of only two elements, and the image given by it is primary and inverted. By the fact of the image being primary and inverted, it looks, at first sight, anomalous that for equal extensions of camera, the image given by the new lens is several times larger than that given by an ordinary lens of hitherto known construction.

In comparing two lenses, no matter of what form of construction (when focussed upon a distant object), if the size of the image given by one is *n* times that given by the other, you are aware that the focus of the one is *n* times that of the other, provided, as before stated, the images compared are direct, primary, and inverted.

The focal length of a lens is measured, for practical purposes, by the distance between one of the principal planes passing through one of the nodal points of the lens towards the principal focal plane (where the image is received) and that plane.

In most lenses in existence the position of the principal plane referred to can be marked upon the lens-mount and has already been suggested, first, I believe, by Mr. Warnerke, as an important addition to the measurement and description of lenses, as furnished by opticians. The most recent and important contribution, however, on this subject was recently furnished by Professor Silvanus Thompson in a very interesting paper, delivered on the 28th of November last, at the Society of Arts, and published in its Journal. In the case of the rapid rectilinear, for example, the nodal point referred to is not exactly at the diaphragm slot, but a little behind it; but in most lens constructions in use the nodal point is within the mounting of the instrument.

In some, however, by the accidents of construction, it is slightly behind the lens, as, for example, in certain forms of deep Meniscus, and in others it is slightly in front or beyond the mount, as in Petzval's orthoscopic. [In last week's BRITISH JOURNAL OF PHOTOGRAPHY this construction was referred to in a letter signed "E. Russell." I wish to call attention to the fact, that the object in introducing a negative element, in the orthoscopic lens referred was for the purpose of the cure of distortion, as its name signifies, although it was not perfectly accomplished, and the model point is thrown only slightly in front of the lens mount by the accident of construction. Mr. J. Traill Taylor has, I believe, already pointed out that this form of construction necessitated a slight enlargement of the image; but in his leading article in THE BRITISH JOURNAL OF PHOTOGRAPHY, of the 16th of October, describing my new lens, he says: "We have frequently dwelt on the advantages that would accrue from such a construction." The argument in Mr. Russell's letter, however, appears to be the good, chary, old one, "that there is nothing new under the sun."]

Now, the main object of this invention has been to *purposely* throw the nodal point, from which the focus is actually measured, to any distance I choose in front of the lens itself into space, thus attaining a large direct image, without the necessity of a bulky and long extension apparatus. This, then, is the principle of the construction, and I will now proceed to demonstrate the manner in which it is arrived at, as also point out the possibilities that the construction permits of qualities that have never existed in any former lens.

The anterior element is a positive lens, preferably of large aperture and short focus; the posterior lens is a negative element of some *fractional* portion of the focal length of the anterior positive lens (in Petzval's Orthoscopic it was more than twice the focus). Roughly, the shorter the focus of the posterior lens as compared with that of the anterior lens, the greater is the size (for a given extension of camera) of the enlarged primary image produced.

I have said that the anterior lens should be preferably of large aperture and short focus. It is self-evident, as, in ordinary constructions, the larger the aperture the greater will be the rapidity; and the reason of its being preferably of short focus lies in the fact that the absolute distance between the planes of its own focus for parallel rays on the one hand, and a near object on the other, is, of course, less with a short-focus lens than with a lens of long focus.

A similarity between this construction and the Galilean Telescope was referred to lately in a French paper, the *Photo Gazette*, by M. Wallon. This, as I pointed out to M. Wallon, of course, is not so absolutely, in that the rays emerging from the Galilean Telescope are divergent, and not convergent; but, by a correct adjustment of the two elements composing the new lens, it *can* be employed as a Galilean Telescope, as I described to Mr. Traill Taylor in the latter part of September.

Referring to the figure, if the negative lens B be placed at proper distances from the positive lens A, the rays can be made to emerge parallel, divergent, or convergent.

For the purpose of forming an image for any given position of the focussing screen, they must be made convergent, producing a direct primary inverted image.

It is immaterial what position may be chosen for the plane upon which the image is to be received; it may be either in close proximity to the posterior lens, or removed to any distance whatever further away; but, in order to focus, it is essential that a correct distance be given between the two elements of the lens itself; in other words, a correct adjustment of their separation, focussing always being most easily and sometimes necessarily accomplished in this manner (Fig. 1). For example, supposing the lens were focussed upon a very distant object—say, the sun—with the focussing screen set at a given distance, it would be impossible by any adjustment whatever of the focussing screen to find a plane where the instrument would come to focus for very near objects (Fig. 2).

Near objects with the lenses in their former adjusted or fixed position would send the rays from such objects, after passing through the entire lens, divergent and not convergent.

On the other hand, if the separation were adjusted between the two elements for a near object, and it was then pointed towards a distant object, it would be found equally impossible to find any position for the focussing screen, in which the focus could be observed, except, as before stated, by an alteration between the separation of the component element of the lens itself.

It is evident that, the longer the focus of the positive element in the construction, the greater would have to be the separation between the two elements for near or distant planes.

In this construction there is, then, no limit to the size of the image that can be obtained, a slight adjustment in the separation of the two elements producing the correct focus on the screen, be it near or distant from the lens itself; but it must be borne in mind that the greater the separation between the plane of the focussing screen and the lens, the less is the rapidity that can be attained (Fig. 1.)

I will now call your attention to the question of rapidity. Sup-

posing the screen be placed at a distance of ten inches from an ordinary lens, and a distant object focussed, say the lens has a focus for parallel rays of twelve inches, if the new lens be made to take its place, and the same object be focussed, it will be found that the image produced is five times larger with the new lens than with the ordinary one, you know then that you are practically, and to all intents and purposes, employing a lens of sixty inches focus!

The question naturally asked is, What will be the rapidity? The answer is, that you have to consider the front lens placed at a distance of sixty inches from the focussing screen; in other words, the nodal point is thrown forward outside the lens to a distance of sixty inches from the focussing screen (Fig. 3).

It is evident to you, then, that too much stress cannot be laid upon the desirability of large aperture for the anterior positive lens.

In the case cited, supposing the lens to be of three inches aperture, you would then be working at an intensity of *f*-20.

difference with one and the same instrument in *the angle* included for moderate amplification or great amplification; but, of course, *more of the plate* is covered when it is removed further and further away from the posterior lens.

Fig. 1

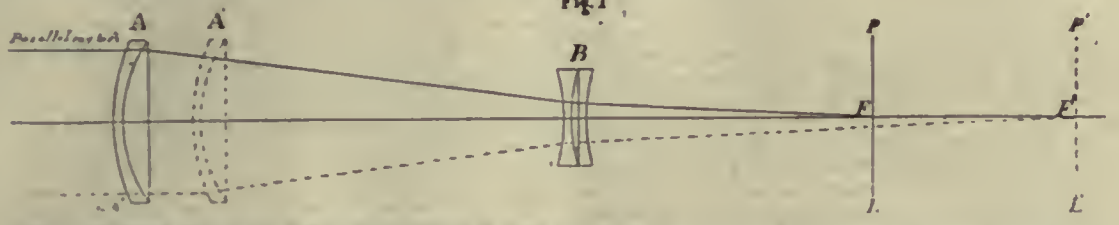


Fig. 1.—The upper black ray meets the lens A parallel to the axis, and, by a proper adjustment between A and B, comes to focus at F upon the plate F L. If F L be removed further from the lens B to take the position F' L', the lines A will have to be moved slightly nearer to B and take the position A'.
The lower dotted line represents a parallel ray falling upon A', which passes through the negative lens B, and coming to focus upon the new position of the plate F' L', at F'.

[The principle employed has a useful bearing on the subject of telescope construction, enabling very much higher powers to be employed on short telescopes.]

I shall feel indebted for any suggestions that may be made by you as to what may be advantageous for any particular applications you may have in view.

With regard to the hand camera, in which the back lens is, say, five inches from the plate, what focus would you like such a construction to represent?

Then, again, for covering larger plates, what is the minimum extension and minimum angle that will be required?

Again, for the sportsman or naturalist, what is about the most convenient length and dimension of plate of box camera to carry?

It will doubtless be interesting to many to know that the applications of this lens to astronomical photography are easily accomplished, and, moreover, valuable, I think.

The negative of the moon that is before you was taken with the first rough lens I completed, with an extension of only twenty-eight inches. I look upon it more as an example of possibilities in size and rapidity of action than definition (that, as you see, I have subsequently attained), although as it is, it has been, I am pleased to say, favourably criticised by persons whose judgments I highly value.

In connexion with this instrument, I should like to point out that the optical finish required is necessarily that of the finest polish bestowed upon astronomical work, for, the greater the size of image chosen, the more are any slight optical defects exaggerated.

Fig. 2

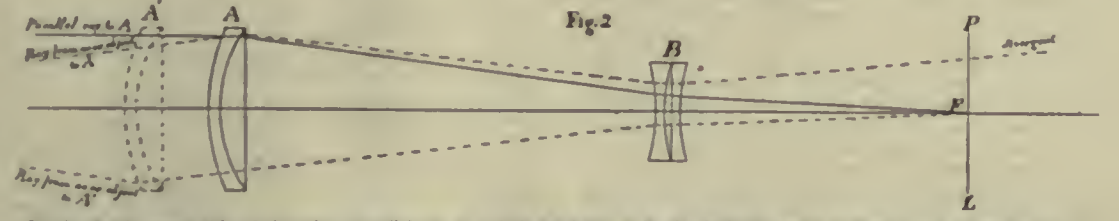


Fig. 2.—On the upper side of the axis a parallel ray to A finds its focus as in the dark line on the plate at F. If, however, some ray from a near object falls upon the lens A in the direction of the dotted line, after passing through the lens B, is found divergent, and no positive focus is obtainable.
In the lower half of the figure, however, A is presumed to take a proper position in A' when the ray from the near object passing through A' and also through the negative lens B finds its focus upon the plate in the fixed position chosen, at F.

In employing this lens, conditions of light will naturally suggest whether it be advisable to employ moderate amplification by having the focussing screen near the lens, the nodal point being thrown moderately forward, or whether the conditions are such as to have a considerable distance between the lens and the focussing screen, and thus throw the nodal point, by the focal adjustment, a long way in front of the lens.

I repeat again that the difference between this and former constructions lies in the fact that any focus that one may choose to employ can be obtained from the minimum (dependent upon the ratio between the foci of the elements), when the plate is close to the posterior lens, up to a maximum, controlled solely by the length of the camera extension possible.

As in the case of the telescope, the greater the magnification required, the less becomes the angle included, and there is very little

Fig. 3

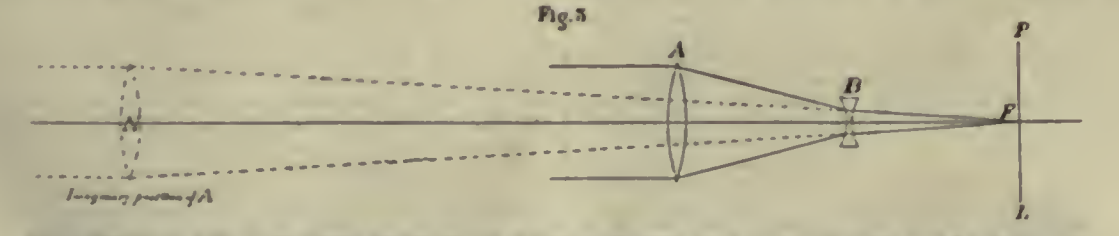


Fig. 3.—Represents a beam of rays passing through the two component elements, A and B coming to focus upon the plate F L. To estimate the rapidity, it is necessary to consider the full aperture placed at the principal focal plane passing through the nodal point at B, A is thus made to take up an imaginary position.
The position of the nodal changes for different positions of the plate F L.

It is possible that the application of short-focus concave lenses, such as myoptic spectacle eyes, in connection with rapid portrait lenses (that in themselves will form the positive elements), will suggest itself to your minds.

Uncorrected lenses in this application will, I may say, cause disappointment; but I am engaged upon the construction of a properly corrected series of negative elements that may be employed in connexion with rapid short-focus portrait lenses, whose construction and correction I am responsible for, so that many who have practically placed their very rapid short-focus portrait lenses upon the shelf will now find a new and interesting application for them.

In conclusion, I may say that I have endeavoured, in this new lens, to reduce the bulk, weight, and loss of light to a minimum; and, while thanking you, gentlemen, for the very kind hearing you have accorded me, I hope that you yourselves may perchance find the instrument as interesting in its various applications as its conception and construction have been to me. THOMAS R. DALLMEYER.

Previous to reading his paper Mr. Dallmeyer exhibited two sets of negatives of distant objects, taken from one and the same point of view with a 10×8 rapid rectilinear lens of thirteen inches focus, and the new lens, with the same extension of camera. One set shown represented a church a quarter of a mile distant, and another set representing the Alexandra Palace Station, the distance in this case being estimated at somewhat over a mile. In both instances the images produced by the new lens were five times (linear) greater than the correspouding images produced by the rapid rectilinear lens. Other negatives were also shown; the magnification and fine definition with the new lens was the subject of much comment and admiration by the members present.

To practically illustrate the properties of the instrument, Mr. Dallmeyer had placed two cameras at a distance of about twenty feet from a small oil lamp, on which were fixed respectively a fifteen-inch "long-focus landscape lens," and the new "tele-photographic lens." It was clearly demonstrated that with equal extensions of camera, the image of the flame on the ground glass was five times greater in the case of the new lens than in that of the ordinary "long-focus" lens; with a greater extension of camera for the new lens, the image was very much larger.

In the course of the paper, lantern slides, representing sheep and horses, taken from 250 yards to a quarter of a mile off, were also shown. In the case of the sheep, comparison slides, taken from the same point of view, with a 15×12 rapid rectilinear of twenty inches focus, and the new lens, were shown, the effect of comparison being very striking. These transparencies represented instantaneous work in dull weather, but were very favourably commented on by the audience. A transparency from a negative of the October full moon was also much admired.

Discussion.

Mr. Traill Taylor said it was a matter for congratulation that one of their members was giving them a lens which, in his (the speaker's) opinion, would be useful in several directions, and had long been a desideratum. He himself had many years since adapted a barrel of the ordinary twelve-lens Voigtlander opera-glass to the camera, and had thus obtained greatly enlarged views, but his fault with it was that its covering power was limited; the image was sharp enough in the centre, but the sharpness was confined to only a few inches around the centre. He had prepared a paper *On Making Enlarged Views by One Operation*, intended to be read at the Bradford meeting of the British Association in 1873, but, instead of devoting it to that purpose, he slightly altered it, and gave it as an editorial article in THE BRITISH JOURNAL OF PHOTOGRAPHY in that same year and month (September 19, 1873), where it would be found. He had not been able to see what construction of eyepiece or negative lens Mr. Dallmeyer employed, but he had no doubt that it was efficient, would answer its purpose well, and do all that was claimed for it.

Dr. G. L. Johnson wished to refer to a point not directly bearing on the lens now described by Mr. Dallmeyer. He had been using a lens working at *f*-4, not a portrait lens, for copying equal size, and found at some points it was absolutely impossible to get a sharp focus. The camera might be moved back half an inch, and then it was easy to obtain focus; another half an inch, and again no focus is obtainable, and so on alternately. He wished to obtain an explanation of this.

Mr. A. Hayman did not see why the new form of objective should not be used with the binocular telescope. He also referred to its adaptation to microscopic objectives of high powers, and inquired as to the origin of Mr. Dallmeyer's experiments.

Dr. Fison asked what was the exposure given for the moon photograph shown? He had not seen anything so good not taken with clockwork movement.

In reply, Mr. Dallmeyer thanked the members who had spoken for their kind expressions with regard to the invention. Mr. Traill Taylor had spoken in very complimentary terms of the achievement, but at the same time seemed to infer that the idea was of his own suggestion. This was very surprising to him, in that when the instrument was first shown to Mr. Traill Taylor, on the 24th of September, he had expressed himself as *astonished*, and had said he had no notion as to the manner in which it was accomplished. He had invited Mr. Traill Taylor, in a friendly way, to see the invention at his office, in the latter part of September, and in this sense had asked Mr. Taylor to furnish him, from his long experience, with any methods that he knew of that would accomplish the end in view. Mr. Traill Taylor had not referred to what Mr. Dallmeyer now understood was put forward as a suggestion originated by Mr. Traill Taylor. In reply to Dr. Lindsay Johnson, Mr. Dallmeyer said that the experiment as described appeared to be anomalous, for at first sight it seemed suggestive that there was some curious property at the positions of the planes for equal magnification, now known as the "symmetrical" planes (happily christened by Dr. Silvanus Thompson). There was, however, in reality no such property, and the only suggestion Mr. Dallmeyer could make for the lack of defining power for near objects was that, if a lens were perfectly free from spherical aberration for parallel rays, there would be a tendency to show negative spherical aberration for near objects, and this would render focussing more difficult. Mr. Dallmeyer would be very pleased to try and elucidate the matter, and examine the lens with Dr. Lindsay Johnson. Mr. Dallmeyer thanked Mr. Hayman for his suggestions. With regard to the binocular telescope, the suggestion was useful and valuable, but at present the great difficulty one had to contend with in the ordinary binocular was the smallness of the field when high powers were employed, so that, although it was possible, by adding a second negative element removed to a proper position from the first, to attain very much higher power, the field would thereby become very small. Mr. Dallmeyer had already considered the adaptation of the principle involved to the microscope, and, although the thoughtful suggestion Mr. Hayman had made *could* be employed, he must remember that by its introduction the magnifying power also of the objective would be reduced by necessarily lengthening its focus. Mr. Hayman had asked how the construction of the instrument had been brought about. Mr. Dallmeyer was glad of the opportunity of referring to this. In his summer holiday, spent with his friend Dr. Emerson, whose attention was now partly devoted to the study of natural history, that gentleman had asked Mr. Dallmeyer to try and fix up for him a large object-glass of some six feet focus, corrected for photographic purposes, mounted in something very light and collapsible, such as in bamboo, carrying the lens at one end and the sensitive plate at the other, in order to obtain large images of distant objects. As a matter of fact, Mr. Dallmeyer had tried, in the first instance, to get such bamboos, but had failed, and he thereupon devoted his attention to some means whereby a direct enlarged image could be obtained, which resulted in the construction he had presented to them that evening. Mr. Dallmeyer was very gratified with Dr. Fison's criticism of the photographic transparency of the moon. The length of exposure was barely one second, in fact, cap "off and on" simply.

[Had there been a short-hand reporter at the meeting to take down what was really said, it would have been seen that Mr. Taylor promptly denied having been asked by Mr. Dallmeyer whether he knew of any means by which such a telescopic effect as that shown him could be produced. Mr. Dallmeyer's memory is slightly at fault as to our having expressed "astonishment" at such effects. It was quite another thing that elicited the expression of this feeling—viz., the exhibition to us of a reflecting or mirror objective for a telescope to be employed as a comet-searcher, and our astonishment arose from its enormous angular aperture, for the focus was very short, and, when the means for correcting the spherical aberration of the mirror were explained, we expressed our admiration, which has not suffered any diminution since, of the ingenuity of the clever optician.

As regards the teleo-photo lens, had Mr. Dallmeyer asked us the question above narrated, we *should* have been a good deal astonished, for we thought that every optician knew that both the astronomical and the Galilean, nay, even the ordinary terrestrial, telescope had long been employed in the production of photographic pictures. Mr. Dallmeyer had not at this time afforded us an opportunity of seeing his new objective, or of learning anything concerning its construction, although we saw the image of his lamp-flame on the ground glass, and expressed our gratification at the prospect of the commercial introduction of a lens which would place a new power in the hands of photographers.

It was only at the Camera Club meeting that we learned for the first time the construction of the negative lens of the combination. But that this application of the Galilean or opera-glass telescope was, or ought to have been well known, at any rate to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, is a fair assumption, seeing that in the JOURNAL and its ALMANAC it has been described no fewer than three times, and not as a crude suggestion, but as an accomplished fact, and never, in any sense, as an original suggestion of our own. Now for the proof. In this JOURNAL of September 19, 1873, and in course of an article entitled "Enlarged Views by One Operation," after speaking of lenses made expressly for taking telescopic photographs in military and naval engineering, we say:—

"As lenses of very long focus necessitate the use of cameras of great

length, the same object—that is, the production of an enlarged direct view—may be obtained (certainly on a plate of small size) by the use of a combination of lenses, the optical centre of which shall be at a considerable distance outside the lens. Of this kind the common opera-glass furnishes an example. An opera or field-glass, if used as a camera lens, produces an enlarged image of objects in nature. We do not here refer to the use of the large or 'object glass' of the instrument, but the combination of object-glass and eye-glass as used for looking through. An objective of this kind will produce an image having a considerable degree of amplification, this depending upon the power of the instrument. Although there is a fair degree of sharpness in the centre of the picture, it unfortunately does not extend to any distance from the centre. This, however, could be remedied, within certain limits, by the adoption of an eyepiece possessing a similar form to that of the negative combination of the old orthoscopic combination. We have an old opera-glass which possesses in a remarkable degree the property of producing a large image with sharpness. Its peculiarity of construction consists in each barrel containing three lenses, each composed of three elements cemented together. The object-glass is apparently a plano-convex, but is in reality a double convex of very unequal external curves; the centre lens is biconcave, and the eyepiece plano-concave, each of these being achromatic in itself. The magnifying power is very great, and, when used as a camera lens, it gives quite a telescopic image."

Again, in the JOURNAL for February 18, 1870, in an article headed *Direct Enlargements*, after combating an impracticable idea, suggested by the chairman of the then existing South London Society, relative to enlarging an aerial image, we spoke of the "old familiar fact" that telescopes with their eyepieces could be employed in the production of telescopic photographs, and described the application of one of the Galilean class (an opera-glass) to this purpose.

Once more: In our ALMANAC for 1877, at page 104, under the heading *A Novel Enlarging Lens*, we say:—

"It may not be generally known that, by means of an opera-glass used as a camera objective, a greatly enlarged image of any view to which it is presented may be obtained. Owing to the shortness of the tube, and to the optical principles involved in the formation of a large image by means of an objective when used in conjunction with a concave eyepiece, this form offers advantages in the production of a directly magnified image not possessed by the ordinary telescope. . . . . This form of 'tube,' when used as an objective for the camera, produced images of great sharpness in the axis, the sharpness being more extended than I have seen it with any other form. By means of this instrument I obtained an excellent and sharp photograph of the sun three inches in diameter."

From the foregoing it will be seen that the principle of applying the Galilean telescope to photography is not a novelty. We repeat what we have already said, that we are much pleased to find that Mr. Dallmeyer has introduced the lens commercially, and this quite apart from what has been previously written concerning the possibilities of such lenses. In introducing new lenses, or lenses believed to be new, however, opticians must take the fortune of war, and they are certainly open to reproach if they do not seek ordinary means for ascertaining what has been achieved or attempted in former times.

Does Mr. Dallmeyer see any possibility of escape from this inconvenient reproach?—ED.]

MR. J. PATTISON GIBSON AT THE CAMERA CLUB.

THE sixty landscape pictures by which Mr. J. Pattison Gibson is represented at the eighth One-man Exhibition of the Camera Club that opened on Tuesday last, January 5, unquestionably take equal rank, judged by any system of comparison, with the best of the collections which have hitherto been placed on view there.

Mr. Gibson is a loving student of nature in her comeliest moods, for his pictures are mostly transcripts of northern wayside, river, and woodland scenes, though, by way of relief, or perhaps contrast, to this vein of repose, he now and then directs his camera towards a snow scene, a mouldering abbey, or a grim, rock-perched castle. Those of us who may have been satisfied to believe, and rash enough to say, that the Tyne was essentially, if not entirely, a "coaly river," will be surprised and delighted at finding that it is occasionally not inferior in beauty to the Thames at Maidenhead. Of the smaller works, *The Lonely Moor*, *The Beautiful River*, *The Banks of Tyne*, and *The Ford*, are, perhaps, the most artistically chosen, and perfectly exposed pictures in the collection.

Mr. Gibson's small work is, indeed, on the whole, to be preferred, both technically and pictorially, to his larger frames, the latter, however, being never larger than 12 × 10. Of these, *The Thaw* is not only a very truthful rendering of a difficult effect, but succeeds in nothing so much as conveying the sensation of departing chilliness to the mind of the spectator. In *An Autumn Haze*, on the other hand, the haze is, as it were, too clearly and obviously localised to the centre of the picture and *Twilight*, a most ambitious attempt, from the same species of defect, only just fails of real masterfulness. Mr. Gibson's haze effects, in fact, as well as a somewhat prominent idiosyncrasy in shading off distances, to secure the best effects of depth and separation, are not so happy as one could wish.

To our mind, however, Mr. Gibson scores an unqualified triumph in *Weary*, a fine theme, most ably and dramatically handled. In the foreground of the picture reclines a tired woman, while the road stretches away for miles, forbiddingly hard and cruel, across an undulating country. It is late afternoon, and the sun is well on the decline. On all hands, it must be allowed that in this picture Mr. Gibson shines poetically, pictorially, and technically. It is unquestionably the finest in the collection.

Mr. Gibson's prints are seemingly chiefly done in platinum or bromide, and the key of most of his tones is that of thoughtfully subdued warmth. His clouds are always cleverly chosen and carefully introduced, and he is laudably sparing in the employment of figures. This very sparingness, however, is the secret of his success in a branch of his art in which few photographers excel. Shall we add, too, that we do not find in any of his pictures a semblance of that unfortunate misapprehension of the functions of a photographic objective which has recently prevailed among many otherwise clever photographers?

Alike to the student or beginner in landscape photography, and that large section of the public to whom the high level of artistic excellence reached by modern photographers is as yet but a partly opened book, Mr. Pattison Gibson's admirable collection offers a capital educational opportunity for the most searching inspection and analysis. Modern landscape photography and one of its acknowledged masters are here seen at their best.

THE ACIDIFIED "HYPO" BATH.

["AMERICAN ANNUAL OF PHOTOGRAPHY."]

FOR so many years photographers have been warned against the danger of acid in their "hypo" bath, that the mention, at no distant date, of an "acid fixing bath" would have excited derision only. In many ways this dread of acid is a desirable fright to cultivate, for acid hypo was one of the causes of the fading in old silver prints on paper, and so many artists' work by "rule of thumb" only that, unless the fear of acid in their "fixing solution" were constantly held before their eyes, there would be danger of an era of economical experimenting and fading.

A bath of hypo rendered acid by mere addition of acid, such as tartaric, citric, &c., it is not advisable to use. Several unstable sulphur acids result from the mixture, and the inevitable result would be deposition of sulphur and salts of silver within the film—be it of albumen on paper or gelatine upon glass. It has, however, been shown that an acid sulphite may be added to the hypo without any apparent reaction whatever taking place, and this is the form in which the fixing bath is made acid when required.

At this stage some of my readers may ask, "What does all this tend to—why make the bath acid?" The answer is (first letting it be understood that only the hypo bath for negatives is now in question) that, when the bath is rendered acid, it keeps in very good condition much longer than when made in the ordinary way, and it prevents to a great extent the yellowing of the negatives that is brought about when they are fixed day after day in an old bath. Negatives fixed in an acid bath have a crisper, clearer appearance, are usually free from yellowness, and, in consequence, "print much quicker." It may be safely said that no one who has given the method a fair trial will go back to the old plan.

But it will be well to point out certain governing conditions in the use of fixing baths generally. A given weight of hypo can only take up a certain amount of bromide of silver, and, if the bath approach saturation point, the result of using it may be the production of insoluble salts of silver within the film, which eventually decompose and lead to the destruction of the quality of the negative, or, perhaps, cause a so-called fading. Hence it should be a rule of working always to use a large overplus of the salt to be on the safe side as regards permanency.

Then, as to the yellowing, the real cause of which is not by any means well understood: When there is no sulphite in the developer, the discolouration always occurs through the products of decomposition of pyrogallol staining the film; with sulphite in the developer this is minimised to a greater or less extent, but not always prevented entirely.

Singularly enough, another cause (for years well known to me and very likely to others) had not been publicly mentioned till Mr. Cowan, at the London and Provincial Photographic Association, pointed out that the employment of the hypo after being previously used for the fixing would cause the yellowing. This is perfectly correct, and it is strange

that no one before called attention to the fact. I would, however, add here that very much depends upon the character of the film as to the extent it will discolour. A thin film will, in ordinary hypo, remain uncoloured when a thick one would be a dark yellow. The same will be observed when using acid hypo: If working with one kind of plate the bath may be used for days, while another kind will begin to discolour after comparative brief use. It is such unnoticed variations of conditions as these that cause the discordant verdict we so often peruse when novel modes of treatment are written about.

In conclusion, I may say I have, since I first used acid in the "hypo" bath, developed it with many hundredweights of hypo without any evil results, and with great benefit to the appearance of my negatives.

It is said that the best plan is to use the bisulphite of soda of the shops. But this is not so readily obtained as ordinary sulphite, and it does not keep well. Hence, I use, for the sake of uniformity, recrystallised neutral sulphite, and I acidify it with sulphuric acid, as being cheaper and just as good as any of the crystallised acids, tartaric, &c., usually recommended. Here is the formula:—

Sulphite of soda	2 pounds.
Strong sulphuric acid	2 ounces.
Water	1 gallon.

Mix the acid with a pint of the water; dissolve the sulphite in the remainder: add the two liquids together.

Of the solution so made, add half a pint to each pound weight of hypo when dissolved to the required strength.

G. Watmough Webster, F.C.S.

THE PHOTOGRAPHIC SOCIETY'S LECTURES.

Mr. Thomas Bolas on the Application of Photography to the Industrial Arts.

On Tuesday evening last the first of the three public lectures arranged for by the Photographic Society of Great Britain was delivered by Mr. Thomas Bolas, F.C.S., the subject being "The Application of Photography to the Industrial Arts." Mr. H. Chapman Jones took the chair, and the attendance numbered between twenty and thirty.

Aristotle's and Kant's Definition of Art.

Mr. Bolas quoted Aristotle as saying that art is a system in which contemplation and contrivance precede production or making, Kant taking much the same view; and then went on to deal with the incentives to its cultivation, among these being the purchasing power of money, impulse, renown, and the necessities of life. As to the æsthetic sense, the beauty of a fleet of ships appealed to one man, and well-made machinery to another. Photography had been expressively, if loosely, called an "art-science." It was a popular phrase, and not a strict definition, such as Aristotle or Kant would use.

Scientific Principles.

Science was the knowledge of principles rather than knowledge of applications. Aristotle's view was that knowledge of conclusions was less important than knowledge of principles. He ridiculed mere scientific jargon, such as that it was more scientific to use grammes than grains. He once read something in which the student was exhorted to use ten per cent. solutions, and then told to make up solutions which were certainly not in ten per cent. proportions. A friend of his recently came into his laboratory, and adversely criticised the label on a bottle of gum. It should have been, his friend said, hydrate of gum. Unmeaning minuteness was often misapplied, and was a hindrance to progress. A little laboratory jargon was only useful in enabling a man to pose as a scientific man in some quarters. Definite untruths hindered progress. He would give an instance of this. An individual recently using a knife said the steel was as soft as butter, and condemned it, but said he found a softer specimen to be as hard as a diamond. The scientific aim had led to good results, when the efforts of the noisy commercialist had not. The negative gelatine process was an illustration of the influence of the scientific aim.

The Scientific aim in the Gelatine Process.

Prior to 1861, suggestions for the employment of gelatine were vague and attracted little attention. The subject was then brought forward by Captain Dixon, who was a co-worker with Hardwich and Sutton. Dixon's experiment culminated in the taking out of a patent for collodion emulsion; Gaudin, working about this time, stated his preference for gelatine over collodion for the purpose. At p. 157, of Sutton's "Notes," for June, 1861, Gaudin said gelatine which could be mixed in nitrate of silver, was most convenient for photogenes. His emulsion was made with separately washed silver iodide and excess of nitrate, and the directions were explicit enough for others to follow. The emulsion was adapted for negatives, and also for positives, by long exposure for printing out. He also pointed out, in the same memoir, how emulsions could be used for readily making developed prints on paper. An exposure of thirty seconds to candlelight and one in diffused light gave a latent image. Gaudin predicted the revolutionary effects of gelatine, but he was not a Commercialist. The matter rested there till 1868, when Mr. W. H. Harrison published a remarkable paper in The British Journal of Photography, on the "Philosophy of Dry Plates," which, from the scientific point of view, was a good elucidation of general principles. He prepared a gelatine bromide emulsion developable in an alkaline solution; Gaudin had developed in solution of tannin, which was non-alkaline. Mr. Harrison did not appear to have made any endeavour to put emulsions or plates on the market. He treated the matter from a scientific point of view, and there was no doubt that to him belonged the credit of having first prepared a gelatino-bromide plate, for alkaline development. He dealt fully with the scientific principles involved. In 1871 Sutton wrote a long letter in The British Journal of Photography dealing comprehensively with the whole question of emulsion making. Maddox followed next, and his process was analogous to Gaudin's. By this time, the way had been prepared for Burgess, Kennett, and others; but ten years elapsed before photographers realised the utility of the process. Gaudin, Harrison, and Sutton, showed the way for the commercialist. A knowledge of principles was the direct outcome of scientific aim, and scientific aim was at the bottom of scientific progress.

Facilities for Experimental Work.

In connexion with the suggested establishment of technological schools, facilities for experimental work should be afforded. At present this has to be done at a person's own expense, but it should be altered; he should not only have tools, but food and lodging. The modern principle of scarcely recognising work with the scientific aim was calculated to hinder the progress of technology. Public or national laboratories had been dealt with by Professor Oliver Lodge at the last meeting of the British Association. The commercialist at present had no means of knowing what had been done in the past, and great national waste had occurred through his attempting operations which experience had shown to be futile. The manufacturer should be able to get such information from a technical institute.

Discussion.

At the conclusion of the paper there was a brief discussion. Mr. William Bedford asked if Mr. Bolas would apply the same rule to the art side as to the scientific side in teaching, and the lecturer replied by quoting Kant and Bacon to show that the teaching of art was impossible, although certain manipulations might be taught which would enable a man to manifest his own individual impressions. The Chairman, from his experience as a teacher of so many years standing, found it difficult to persuade people that principles must be taught. They looked for an immediate application of them. Mr. E. Clifton looked in the near future to great assistance from the popular press, and thought journals of the *Tit-Bits* type useful in disseminating technical information. Mr. Bolas avowed himself a reader of *Tit-Bits*, and said he thought that these items of technical news should have a date and their source appended to them. Mr. W. Coles wanted to know how the food and clothing were to be provided, and how Mr. Bolas would distinguish between those entitled to facilities for experimental work and those who were not? The lecturer thought the questions outside the scope of his lecture. They must first recognise principles, and then find means. The means were a difficulty in all conditions of society, and were a difficulty now. The matter would gradually solve itself. Absolute, complete, and unfettered democracy in the ideal sense was coming; but they were not ready for it now.

The lecturer was thanked, and the meeting ended.

COLOUR PHOTOGRAPHY "AN ESTABLISHED FACT."

(Philadelphia Public Ledger.)

A large audience of ladies and gentlemen, which crowded the hall of the Franklin Institute last evening, heard a most interesting lecture by Mr. William Jennings, on the beauties and wonders of the Yellowstone region, and witnessed, thrown upon a screen, a fine collection of photographic views, in which Mr. Frederic E. Ives successfully reproduced the colours of nature. On August 9 last Mr. Ives and Mr. Jennings started from the Broad-street station of the Pennsylvania Railroad, fully equipped with cameras and kodaks for a four thousand mile journey, and they succeeded in capturing views of some of the grandest scenery in the country.

Mr. Ives, who was introduced by Professor Houston, said the greater portion of the illustrations shown were "snap-shots" made by Mr. Jennings, and the pictures, he said, would do credit to the best photo-

graphy. This assertion was strongly borne out by the enthusiasm of the appreciative audience. Mr. Ives also explained that he had remedied certain defects in his colour camera, and he had been so successful in obtaining open landscapes and other views as to convince former sceptics of the possibility of making photographs in the colours of nature. The limelight used last evening, he said, was not powerful enough to bring out the sunlight illumination, but the effect produced was intermediate between moonlight and sunlight. The occasion, he said, was the first in the world in which an attempt was made to illustrate a lecture with photographic pictures in the natural colours, and before the close of the season he meant to demonstrate the success attained with a greater variety of subjects.

Mr. Jennings then followed with the story of the trip, and told it in such a vivid manner as to fairly carry his hearers along with him. Some of the views shown were extremely beautiful, and when the last picture had been thrown upon the screen, the general feeling seemed to be that the reproduction of the colours of nature was an established fact.

A "PARALLACTIC" METHOD OF FOCUSSING.

["American Annual of Photography."]

Every one who uses a copying camera is well aware of the shortcomings of the ordinary ground-glass screen, when it is a question of accurate focussing. The difficulty grows as the scale of enlargements increases; and the employment of a magnifying-glass often serves only to make matters worse, as it exaggerates the inherent defects of the ground-glass surface to such a degree that the finer lines of the enlarged image are with difficulty seen, and with still greater difficulty brought to a satisfactory focus.

Examine a piece of ground glass with a microscope; it will be found to be not a plane surface by any means, but a very rough aggregation of hills and valleys, strewn all over with jagged points which reflect the light in all directions. Mathematical accuracy of focus cannot be secured on such a surface; we might as well expect to make fine micrometer measurements on a cobblestone roadway.

In the plan of focussing now proposed in this article, the focussing screen, as such, is discarded altogether (its office being merely to give a general idea of what will appear on the plate), and the image, formed in *space*, is examined and made clear and sharp by a specially made magnifier. The method is called a "parallactic" one, from its likeness to the well-known usage of astronomers in getting a sharp focus on a faint telescopic object. The working eyepiece of telescopes—as everybody knows who has peeped through them—have one or more fine lines stretched across the field, lying in the precise focal plane of the eyepiece. These lines are variously called "cross-hairs," "spider-lines," "contact-wires," &c. Now, when an observer at the eye end of a telescope wishes to assure himself that an object within the field of view is accurately focussed, he first brings it into contact with one of the cross-wires of the eyepiece. Then he moves his eyes very slightly from one side to the other, or up and down. If the observed object "wabbles" in the slightest degree as the eye changes place, the focus is at once known to be inexact. (For, unless the image and the wire are in the plane, there will be an apparent movement of the former, due to parallax.) But when, by moving the eyepiece in or out, a position is found in which the object seems quite stationary on the wire, the focus is perfect.

Now, to apply this procedure to the camera:

Get any optician to make what is known as a "positive eyepiece," magnifying, say, twenty or twenty-five times, with two cross-wires placed thus + at its focus. (Such eyepieces ought not to cost more than $5 each.) Around the tube of this eyepiece have a collar fitted—like the "flange" of a lens—so that when the collar, or flange, rests against the smooth face of the ground-glass screen, the cross-wires will be in the exact plane of its roughened or focussing surface, the eyepiece, of course, projecting through an aperture in the glass.

Instead of going to the trouble of boring a hole in the ground glass, the focussing screen could be made in two pieces or strips, leaving an open space as wide as the diameter of the eyepiece tube, along the median line (laterally or vertically, as found most convenient) along which the eyepiece slides; thus giving a choice of objects to focus on.

For example, an 8 × 10 focussing screen adapted in this way for use with an eyepiece of one inch outside diameter would be made of two strips each 3½ × 10 inches, fastened in the upper and lower halves of the containing frame, leaving a one-inch slot for the eye-piece to travel along. These strips are preferably made of *plate* glass with truly parallel surfaces, and they should be selected first of all, and given to the optician so that he can adjust the eyepiece flange to correspond.

To use:—

Get the picture approximately focussed on the ground-glass strips. Place the eyepiece in the groove. Move it about so that the cross-wires are in contact with any convenient object in the picture. Rack the focussing screen in or out until a movement of the eye in any direction produces no apparent displacement of the image on the wire. The focus is then accurate.

Clarence E. Woodman, Ph. D.

Our Editorial Table.

The American Annual of Photography for 1892.

London Agents: Hampton, Judd & Co., Farringdon Street, E.C.

In this *Annual* the New York *Photographic Times* has given us a volume which amply keeps up its high character. It is quite plethoric with illustrations, there being no fewer than twenty-four, representing various styles of printing. The text portion covers many phases of photography, and is contributed by American and English authors, whose names are well known. Elsewhere we give extracts from its pages. The name of the Editor does not appear.

Percy Lund & Co's. Plate Backing Papers and Print-drying Pads.

Messrs. Lund & Co. have submitted to us samples of non-actinic paper, coated with an adhesive substance. These will be found exceedingly effective for backing purposes. The same firm's print-drying pad consisting of a number of sheets of bibulous blotting-paper, placed between metal sheets, is an addition to the implements of the amateur's printing room of considerable convenience. The need of a means for easily drying and flattening prints is often experienced, and in these pads it is neatly supplied.

Fallowfield's *Remembrancer* for January, quite sustains its reputation for placing buyers *en rapport* with the newest introductions and appliances on the market at the earliest moment.

New Diaphragm Shutter.

Bausch & Lomb Optical Company.

This new American shutter has been introduced into this country by Messrs. Charles, Reynolds & Co., 72, Fore-street, London, E.C., who are the wholesale agents for it. The cut gives such a good illustration

of the shutter as not to necessitate much explanation. It can be set for time as well as for instantaneous exposures, and by rotating the disc at the top, the iris diaphragm can be set to any desired aperture, from the greatest to the smallest. The shutter is neat and elegant, and, as regards construction, is a fine specimen of mechanical excellence.

The Photographer's Diary and Desk-book for 1892.

James Blackmore, 55, Chancery-lane.

For several years past we have been happy to welcome the publication of this serviceable volume. In addition to a large collection of standard formulæ and other information likely to be of use to photographers, the diary portion, interleaved with blotting-paper, will be found very handy by business men. The book has, by way of frontispiece, a portrait of Mr. William Bedford, which is a capital likeness. Accompanying it is a short sympathetically written biography of the past President of the Convention, the fidelity of which will be instantly recognised and appreciated by that gentleman's many friends.

Lantern Slides and How to Make Them.

By A. R. Dresser.

The second edition of this manual (published, as before, by the Fry Manufacturing Co.) has received several additions at the hands of the author, and now numbers fifty-six pages. In this edition Mr. Dresser gives directions for toning slides by the uranium and ferridcyanide process, presumably already known to most of our readers. But such directions, coming from a practical man like the author, will ever be received with interest. The *brochure* is written in a pleasant style.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
January 11	Darlington	Trevelyan Hotel, Darlington.
,, 11	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 11	Lantern Society	20, Hanover-square.
,, 11	Norfolk and Norwich	Bell Hotel, Norwich.
,, 11	North Middlesex	Jubilee Hall, Hornsey-road, N.
,, 12	Brighton	Arch 40A, King's-road, Brighton.
,, 12	Derby	Smith's Restaurant, Victoria-street
,, 12	Great Britain	50, Great Russell-st., Bloomsbury.
,, 12	Manchester Amateur	Lecture Hall, Athenæum.
,, 12	Newcastle-on-Tyne & N. Counties	Mosley-st. Café, Newcastle-on-Tyne.
,, 12	Paisley	Committee Rm., Free Lib. & Museum
,, 12	Stockton	Masonic Court, High-street.
,, 13	Ipswich	Art Gallery, Ipswich.
,, 13	Leicester and Leicestershire	Mayor's Parlour, Old Town Hall.
,, 13	Munster	School of Art, Nelson-place, Cork.
,, 13	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 13	Putney	High-street, Putney.
,, 13	Reading	
,, 13	Stockport	Mechanics' Institute, Stockport.
,, 14	Birkenhead Photo. Association	Association Rooms, Price-street.
,, 14	Birmingham	Lecture Room, Midland Institute.
,, 14	Bradford Photo. Society	50, Godwin-street, Bradford.
,, 14	Camera Club	Charing-cross-road, W.C.
,, 14	Cheltenham	
,, 14	Hackney	Morley Hall, Triangle, Hackney.
,, 14	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 14	Manchester Photo. Society	36, George-street, Manchester.
,, 14	North Kent	Gravesend.
,, 14	Oldham	Lyceum, Union-street, Oldham.
,, 15	Cardiff	
,, 15	Holborn	
,, 15	Leamington	Trinity Church Room, Morton-st.
,, 15	Maidstone	"The Palace," Maidstone.
,, 15	Richmond	Greyhound Hotel, Richmond.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

December 31,—Mr. C. H. Cooke in the chair.

Messrs. A. J. Campbell, J. Cole, and G. T. Harris were unanimously elected members of the Association.

Mr. J. Traill Taylor presented a copy of The British Journal Photographic Almanac for 1892, and Mr. H. E. Davis *The Tannin Process*, by C. Russell, for the Association's library. The donors were thanked.

Mr. W. E. Debenham exhibited a glass-cutting board of his own contrivance. The gauges were hinged together, and folded back. The size of the board was 10 × 12. The gauges together measured eight and a half inches, and cuts to that size, and to six and a half inches, four and three quarter inches, four and a quarter inches down to one and five eights of an inch could be made by turning back the flaps as required.

Mr. G. W. Atkins showed a number of lantern slides developed with the rodinal developer distributed at a previous meeting. He had found it very quick in action.

Mr. A. Haddon inquired the grounds upon which Mr. J. Weir Brown considered the pictures produced by his new uranium toning process permanent. Hypo and potassium ferridcyanide were used to dissolve out the silver, and this necessitated prolonged washing, which would remove the image. A dilute solution of acetic acid would retain the uranium image, but this could not be used on account of the hypo. In consequeace of these toning experiments uranium would probably be used a great deal in future. Uranium nitrate was not a very cheap salt, and it might be useful to know how to save the residues. The Eastman Company, in their uranium toning instructions, advised the emptying of the used solution down the sink. He (Mr. Haddon) thought it would be better to use a small quantity of a cheap salt to enable one to recover the uranium. If a small quantity of potassium ferrocyanide were added to the used toning solution, it would throw a deposit of ferrocyanide of uranium. On some future occasion he would give a method of converting the uranium ferrocyanide into nitrate.

Mr. T. E. Freshwater, in connexion with the permanency of bromide prints, quoted from a letter he had received from a friend residing among the Himalayas complaining that some bromide prints issued as book illustrations during the last five years were badly faded, and, in some cases, nearly obliterated. The silver print, issued with Abney and Robinson's silver printing, was nearly as good as when issued. Platinum prints, when mounted behind glass, developed a fungoid growth over the surface. Some 12 × 10 albumen prints showed no change, although the mounts had yellowed. They were made from vigorous negatives, and the paper sensitised in a fifty-grain bath. They lasted longer and were better than the prints now issued in fine black tones.

Mr. T. Bolas observed that there was one condition under which no silver print would not fade. In referring to silver prints he excluded prints toned with gold. The condition most destructive to permanency was the presence of sulphuretted hydrogen. If silver prints were kept in a damp place, sulphuretted hydrogen would be formed, and destroy the print. It was the custom of paper-makers to search for substances for tenacious fibres, and sulphate of lime had long been used. The action of moisture and organic matter on sulphate of lime produced sulphide of calcium, caused by the organic matter of the paper reacting with the lime, and so forming the sulphide. The carbonic oxide or dioxide of the atmosphere deposited carbonate of lime and free sulphuretted hydrogen in the paper. They knew that any ordinary book, if put in a damp place, would soon smell of sulphuretted hydrogen. Sulphate of lime being reduced to sulphide, the reaction of the latter with carbon dioxide liberated sulphuretted hydrogen, which no silver print would stand; for all silver prints would fade under the action of sulphuretted hydrogen. The presence of sulphate of lime in papers and mounts would account for the fading of silver prints. The sulphide of silver formed was dark, if there was enough of it; but probably it was oxydised into sulphate, and became diffused through the paper, which would account for the fading of the prints. In time the whole of the silver would be diffused through the book. It had been said that the paper of the books referred to, when sent out, was damp. A damp book, put on a dry shelf, would be mouths before it was dry.

The subject for the evening was *Warm Tones on Lantern Slides*, and Mr. Cowan observed that he found no difficulty in getting warm tones with chloride plates. With bromide plates he recommended the use of carbonate of ammonia in the developer.

Mr. J. Traill Taylor exhibited several slides produced by various methods. One, which had a beautiful warm tone, produced either by mercury followed by ammonia, or sulphide of ammonium, had, as they could see, faded very much. There was another in the act of disappearing. Some, made in 1868 by wet collodion were toned by immersion in a weak solution of potassium sulphide, and were quite as good now as when done.

Mr. Bolas asked Mr. Taylor if he thought the whole of the image was converted into silver sulphide, or whether another compound was formed which might be more stable than the normal sulphide?

Mr. Taylor said probably such a compound was formed. In reference to one of the slides, he might say that Fox Talbot had borrowed it of him, in order to engrave it by photoglyptography. He did not undo it, but got excellent sharpness, employing a light which gave no parallax. He placed it in contact with the steel plate, and sent the light through the glass. The result was perfectly sharp, having the light at a considerable distance. The small beam of sunlight used gave no parallax.

Mr. Bolas thought the method quite practicable, and referred to the making of a single carbon print by printing through the glass at the bottom of a box two feet deep, pointed towards the sky.

Mr. W. Coles inquired if the method would do for larger sized prints.

Mr. Bolas replied in the affirmative, and said a single print produced by that method would be good enough for ordinary purposes.

Mr. Taylor said that he had borrowed a hint from Fox Talbot in printing wet-collodion transparencies separated by strips of paper or cardboard. The sharpness was excellent, the light being the limelight, placed at a considerable distance away.

Reverting to the subject for the evening, Mr. E. W. Parfitt asked if the illuminant employed had anything to do with warm tones?

Mr. W. Bedford thought the tones of lantern slides were influenced by the developer, and not, as some thought, by the exposure. If, as had been said that evening, the illuminant were the cause of the different tones, they might soon hope for pictures in natural colours.

Mr. Beckett alluded to a remark of Mr. Wellington's at a previous meeting, alleging that the tones on bromide prints were affected by exposure. He supposed this applied to plates as well.

After some further remarks by Messrs. Debenham, Everitt, the Chairman, and others, the meeting terminated.

Camera Club.—December 31.—Mr. T. M. Brownrigg exhibited a collection of his slides, including scenes in London, catbedral interiors, and landscapes. Amongst the latter, which were mostly from hand-camera negatives, were some pictures of subjects taken on the Wey and around Guildford. Mr. Brownrigg gave the most entertaining and amusing descriptions with his pictures. Other slides were shown by Messrs. Frank Howard, Williams, Howlett, Patterson, Burchett, and Lieut.-Colonel Gale. On January 14, a paper will be read by Mr. J. Howson, entitled, *The pros and cons of Chloride Printing.*

North London Photographic Society.—January 5, Mr. J. Traill Taylor in the chair.—After the presentation of The British Journal Photographic Almanac, 1892, by the President, a circular from the Photographic Society of Great Britain was laid before the Society, and Mr. A. Mackie was appointed a delegate to represent the Society on the Affiliation Committee. The evening being occupied as a technical night, several members brought objects of interest, among them Mr. A. E. Smith, who showed some very successful carbon prints, and also some negatives of electric sparks. Mr. Coventon asked the solubility of carbonate of lithium, and it was stated, on the authority of Mr. Cowan, to be

four grains to the ounce. Mr. A. E. SMITH asked if Dallmeyer's new lens would be suitable for copying. Mr. MACKIE pointed out that the field would be too small for practical use. Mr. GROVER showed some bromide prints, toned by Mr. Weir Brown's process. The prints had been developed by ferrous oxalate, and, owing to insufficient clearing, were rapidly yellowing in the whites. It was suggested that the reason why hydroquinone was recommended in this process was probably owing to the difficulty of thoroughly removing the iron salts. Mr. COVENTON brought an old stereoscopic shutter on the roller-blind principle, bearing Dallmeyer's name, and believed to be of the date of about 1861. Mr. PARFITT mentioned that Mr. Beard had made for him a safety apparatus, for preventing explosions in pressure gauges, the entrance to the gauge being closed by a screw having a slight passage in the threads, preventing any sudden pressure. Mr. GROVER stated that the principle had been adopted before in a well-known water valve, which was now superseded. Mr. GROVER described a series of experiments which he had made to produce explosions by pressure of oxygen from a cylinder in presence of a number of different substances, such as iron, steel, and brass filings, as also scraps of leather, and a few drops of oil, the result being that with the leather, as well as with the oil, there was a violent explosion, sufficient to have destroyed any gauge which might have been attached.

Croydon Camera Club.—January 4, the President (Mr. H. Maclean F.G.S.) in the chair.—*Platinum Printing*, by Mr. B. GAY-WILKINSON. By means of prints taken from such notable negatives as *The Shrimper*, *The Ebbing Tide*, &c., Mr. Wilkinson explained, without *arrière pensée*, how he works the platinum process so successfully as to carry off the "blue ribbon" of the photographic world, which he has done more than once. It is needless to describe the manipulations gone through, but one point that is noteworthy is the thin character of the negatives worked with. These, being developed by pyro-ammonia, no doubt have a greater range of density than is noticeable to the eye, but none the less Mr. Wilkinson's negatives are not vigorous and sparkling, as we are often told they should be for the platinotype process. Specially was this flatness noticeable in the case of an evening effect upon the seashore, which, nevertheless, yielded a print which, produced on this occasion for the first time, is likely to be seen a good deal more of on the walls of future exhibitions. Following the demonstration, Mr. Wilkinson showed a number of his lantern slides, interspersing these illustrations with many useful hints and interesting anecdotes. It may be serviceable to readers to know that Mr. Wilkinson's masterpieces were all done on Wratten's plates, and his lantern slides are Mawson's, by reduction from 10 × 8 and over. As important subsidiary aids to success, he believes in unsparing trimming and rough paper. He does not use a hand camera.

Richmond Camera Club.—January 1, Mr. Cembrano presiding.—Lantern night.

Cheltenham Photographic Society.—December 22.—General F. Dawson and Colonel H. M. Saunders gave a demonstration of Enlarging and Reducing by Limelight, working with Mr. Hughes's Bijou half-plate enlarging lantern. The chief object the demonstrators had in view was to show that with no other apparatus than Hughes's patent rectangular condenser and a small camera reductions from half and quarter-plate negatives could be made with ease and certainty, and without daylight, the ordinary writing-table being used, and with an exposure of from four to ten seconds, according to the density of negative. A negative was selected having considerable density in the middle and with rather weak marginal definition. The exposure was judged to be eight seconds, with blow-through jet and Thomas's lantern-slide plate. Developed with three grains of quinol, three grains of hydrate soda, and half a grain of bromide, the exposure was found to be correct. The advantages of this system were pointed out to be the compactness of the apparatus by using the rectangular condenser; this was the same size as an ordinary half-plate or 6½ × 4¾. Nothing is needed but the condenser, fitted up as any one used to photographic manipulation might easily make for himself. The negative is placed close to the condenser, the small camera fixed at a proper height and at a proper distance from the negative, and the condenser then properly illuminated, which is seen by the ground glass of the small camera showing a clear and shadowless light. The negative is then inserted in its carrier, and the exposure made. The small camera is placed in position roughly by measurement, according to the scale of enlargements and reductions in any book of reference, and the fine adjustment made by the rack of the camera. The full seven-eighth opening of the lens was used, of rapid rectilinear class, six inches equivalent focus. An enlargement with the Bijou apparatus was then made with the full opening of the lens supplied from half plate to 15 × 12, the exposure being modified by shielding those portions requiring it, and prolonging the exposure on other portions. The negative was a very trying one, and was selected for that reason. An exposure of eighty seconds (about) over the whole picture, extending to two minutes for some rather hard water from a mill-race was sufficient. Any ordinary negative not requiring shielding would require about sixty to eighty seconds. The development was with Thomas Brothers' single solution quinol developer used weak, about one drachm to twelve drachms of water, which developed the enlargement satisfactorily and with a good colour.

Leeds Photographic Society.—December 21, Annual Meeting, Mr Godfrey Bingley (President), in the chair.—The following gentlemen were elected as members of the committee for the year 1892:—Messrs. Godfrey Bingley, W. A. M. Brown, Herbert Denison, E. H. Jacob, M.A., M.D., A. E. Nowell, Rev. E. S. Palmer, Robert Steele, T. W. Thornton, J. H. Walker, and S. A. Warburton. The thanks of the Society were given to Messrs. Butterworth, Rodwell, Thornton, and Warburton for the long and valuable services they had rendered to the Society. The officers for the year 1892 are as follows:—*President*: E. H. Jacob, M.A., M.D.—*Vice-Presidents*: Godfrey Bingley and S. A. Warburton.—*Hon. Librarian*: W. A. M. Brown.—*Hon. Lanternist*: J. H. Walker.—*Hon. Treasurer*: T. W. Thornton.—*Hon. Secretary*: Herbert Denison.—*Assistant Hon. Secretary*: Robert Steele.

Tyneside Camera Club.—December 15, the President (Mr J. F. McKie) in the chair.—A member read a paper on *Old and New Developers*, and showed what the separated ingredients of a developer were expected to do. In the discussion which followed, the PRESIDENT said that the new developers were like delicacies, but when we want good, steady work, we generally fall back on pyro-ammonia. January 19, *Enlarging, Copying, and Reducing, and the Apparatus*, by J. F. McKie.

Photographic Society of Philadelphia.—December 9, 1891, the President (Mr. John C. Bullock) in the chair.—A very large collection of interchanging slides from the Lantern Society of London, England, was shown. They are a remarkably fine set, and certainly one of the best collections ever sent to the Society in this manner. Mr. CHEYNEY called the attention of members to an interesting book which he had come across, published in Philadelphia in 1853. It was entitled *Plain Directions for Obtaining Photographic Pictures by the Calotype and Energiatype, &c.*; also *Practical Hints on the Daguerreotype*, by J. H. Croucher. He read various extracts from the book, which were interesting as contrasting some of the old-time photographic processes with those of the present day. Peculiar interest, however, was attached to one of the extracts on "Daguerreotype Panoramique," an account of recent threats said to have been made by M. Moissard to prosecute certain Americans for an alleged violation of his patents. The extract read as follows:—"*Daguerreotype Panoramique.*—This apparatus is constructed to admit of a view of considerable length and of extreme nicety of delineation, being taken with a lens of moderate diameter. The lens is made to have a horizontal movement, which brings it to bear successively upon every part of the horizon within 150°. Having been fixed so that the vertical lines of the object are perpendicular with a line drawn through the ground glass on which the focus is taken, the prepared plate is placed in a *flexible frame*, and retained in a certain curve by stops fixed to the frame. The lens is now turned to the extreme limit of the view to be taken, and then gradually and smoothly moved onward by a rackwork attached to the camera till it reaches the other extremity, waiting a longer or shorter time at each point as the object is more or less illuminated. The plates are prepared and fixed in the ordinary way. The use of this instrument is difficult, however, and requires considerable practice to produce good pictures." Mr. CARBUTT stated that, in view of the increase in stereoscopic work, it might be well to mention that a very simple way of making transparencies for the stereoscope consisted in the use of cut films with a matt back. To obtain a perfect stereoscopic effect, the negative has to be bisected and the views changed around. If the negative was taken on a film, it could readily be cut with a square and knife so that they would come together perfectly. Where glass plates were used, they had to be cut with a diamond, thereby running the risk of a rough edge. At the next meeting he intended to show some very good results in transparencies of the kind referred to. Dr. MITCHELL asked whether any of the members had tried the new developer, "para-amidophenol." He expected to show a few lantern slides at the next meeting made by this developer, which was claimed to be the coming developer. So far it was extremely expensive, the wholesale price being about thirty-five cents per drachm; but it was very powerful, and worked quickly and strongly in a very dilute solution, about one part to two thousand. It was particularly excellent for bromide paper, giving much better whites than could be obtained with oxalate.

RECENTLY ELECTED OFFICERS OF SOCIETIES.

(*Received too late for the* ALMANAC.)

ASHTON-UNDER-LYNE AMATEUR PHOTOGRAPHIC SOCIETY.—Established 1891. *President*: Dr. A. Hamilton.—*Vice-Presidents*: J. W. Kenworthy, C. E. Redfern, Rev. H. J. Palmer, Major Bradley.—*Committee*: W. Chadwick, T. Glazebrook, W. Greenwood, R. Hall, W. Leigh, R. Matthews, J. H. Storey, G. Wells.—*Exhibition Sub-Committee*: Messrs. Hamilton, Kenworthy, Palmer, Marsland, Glazebrook, and Candelet.—*Treasurer*: R. T. Marsland.—*Hon. Secretary*: G. H. Dean, 8, Egmont-terrace, Stalybridge.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.—Established 1885. The Society meets second and third Thursday at Half-past Seven at the Lecture Room, Midland Institute, each month October to April, and fourth Thursday only during the five summer months except Lantern Nights, when meetings are held at the Young Men's Christian Association Room, Needless Arley. *President*: J. B. Stone, J.P.—*Vice-Presidents*: W. J. Harrison, F.G.S., E. H. Jaques, J. J. Button.—*Council*: F. S. Goode, W. Jones, A. J. Leeson, A. R. Longmore, G. A. Thomason, T. Taylor, E. E. Underwood, G. Wilkes,—*Librarian*: W. S. Horton.—*Treasurer*: W. Rooke.—*Secretaries*: J. T. Mousley, 26, Portland-road, Edgbaston; A. E. Tucker, 5, Paradise-street.

BOURNEMOUTH SOCIETY OF NATURAL SCIENCE (PHOTOGRAPHIC SECTION).—Established 1889. *President*: Dr. Hyla Greves.—*Vice-President*: Rev. J. R. Husband, M.A.—*Committee*: Rev. G. H. West, D.D., S. Hardwick, F. W. Cory, P. H. Price, G. Piercy, G. Schofield.—*Treasurer*: W. Dolomore.—*Secretary*: William Jones, 203 and 205 Old Christchurch-road.

BROOKLYN ACADEMY OF PHOTOGRAPHY.—Incorporated February, 1887. The Business and Social and Working Rooms are located in the Brooklyn City Safe Deposit Company's Building, 177 and 179 Montague-street. The Lectures are given in the Hoagland Laboratory, Henry-street, corner of Pacific-street. Business Meetings are held the second Wednesday evening of each month at Eight p.m. Annual Meeting second Wednesday in February at Eight p.m. *President*: Frank La Manna.—*Vice-Presidents*: Gonzalo Poey, William Arnold.—*Council*: the Officers and J. Merritt, M.D., George S. Wheeler, Starks, W. Lewis, T. R. Mills, H. Allen Smith, R. N. Dennison, M.D.—*Treasurer*: Edward H. Quantin.—*Recording Secretary*: Hermance Tremper, West Brooklyn.—*Corresponding Secretary*: Harry S. Fowler, 578, Halsey-street, Brooklyn, New York.

CASE SCHOOL CAMERA CLUB.—Established 1888. *President*: Henry J. Leuke.—*Vice-President*: Arthur G. Bishop.—*Treasurer*: Percy W. Cobb.—*Secretary*: Robert B. Smith.—*Corresponding Secretary*: Cass L. Kennicott, Case School of Applied Science, Cleveland, Ohio.

CYCLISTS' PHOTOGRAPHIC PORTFOLIO CLUB.—A Circulating Photographic Club, numbering at present thirty members. Four portfolios are circulated from member to member, each member changing his prints and criticising

those of others when the portfolio reaches him. *Secretary:* W. L. J. Orton, 7, Bishop-street, Coventry.

CREWE SCIENTIFIC SOCIETY, PHOTOGRAPHIC SECTION.—Meetings held at Mechanics' Institute monthly. *President:* A. H. Hignett, Esq.—*Committee:* W. Allwood, J. S. Hough, J. Lewis, H. J. Parkinson, F. S. Ransome, F. C. Tiple.—*Hon. Secretaries:* W. Bispham, 60, Samuel-street, and Joseph Laing, Victoria-street, Crewe.

DERBY PHOTOGRAPHIC SOCIETY.—*Secretary:* Thomas A. Scotton, 9, Church-street, Derby.

LIVERPOOL PHYSICAL SOCIETY, PHOTOGRAPHIC SECTION.—Established 1890. *President:* F. Hurter, Ph.D.—*Treasurer:* C. A. De Seux.—*Secretary:* Charles A. Kohn, Ph.D., B.Sc., University College, Liverpool.

MUNSTER CAMERA CLUB.—Temporary rooms, Crawford Municipal Schoo of Science and Art, Nelson's-place, Cork. *President:* Major J. Douglas Lysaght, A.P.D.—*Vice-Presidents:* Ringrose Atkins, M.A., M.D., Denny Lane, M.A., Henry S. Noblett.—*Committee:* Richard S. Baker, John Bennett, James Bradshaw, John Day, Richard Foley, Patrick Hallinan, William Harrington, Henry Lund, Rev. James O'Mahony, Kingsmill B. Williams.—*Hon. Treasurer:* William R. Atkins, F.C.A., 39, South Mall, Cork.—*Hon. Secretary:* Denham Franklin, J.P., 74, South Mall, Cork.

THE NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS OF GREAT BRITAIN AND IRELAND.—Established February 13, 1891. Ordinary Council meetings every three months. Annual meeting, second Thursday in February. *President:* H. J. Whitlock (Birmingham).—*Vice-Presidents:* T. Fall (London), Chevalier Lafosse (Ilfracombe), R. Slingsby (Lincoln), J. E. Shaw (Huddersfield).—*Committee:* W. Barry (Hull), W. Bedford (London), T. Birtles (Warrington), Warwick Brookes (Manchester), J. E. Bruton (Douglas, Isle of Man), J. Chancellor (Dublin), T. Storey Davis (Halifax), Debenham (London), J. E. Eddison (Barnsley), J. Elliott (Elliott & Fry, London), J. Fergus (Largs), — Guy (Cork), William Gill (Colchester), R. P. Gregson (Blackburn), Lafayette (Dublin), Abel Lewis (Clifton), Donald MacIver (Leeds), John Moffat (Edinburgh), C. Pettingall (Liverpool), Frank M. Sutcliffe (Whitby), Carl Vandyke (London), H. Vanderweyde (London), F. M. Whaley (Doncaster).—*Hon. Treasurer:* J. Crosby (Rotherham).—*Hon. Secretary:* C. P. Richards (Barrow-in-Furness).—*Secretary:* D. J. O'Neill, 47, Charlotte-road, Birmingham.

NEW ORLEANS CAMERA CLUB.—*Pres dent:* L. E. Bowman.—*Vice-President:* P. E. Carriere.—*D rectors:* The officers, and Miss Gladys Rueff, B. C. Shields, R. H. Palfrey, J. A. Streck, G. N. Maxent.—*Treasurer:* W. M. Rhodus.—*Secretary:* R. S. Charles, jun., Cotton Exchange Building, New Orleans.

OLD COLONY CAMERA CLUB.—Established February 1, 1890. *Pres dent:* David Smith.—*Vice-Pres dent:* Fred Aines.—*Secretary and Treasurer:* H. W. Stuelly, Rockland, Mass., U. S. A. Box 210.

OLDHAM PHOTOGRAPHIC SOCIETY.—Established 1867. *President:* W. Thompson.—*Vice-President:* J. Chadwick.—*Committee:* J. H. Ashton, J. Brooks, J. S. Dronsfield, J. Greaves, jun., T. Heywood, W. Jackson.—*Librarian:* L. Tetlow.—*Treasurer:* W. Schofield.—*Hon. Secretary:* Thomas Widdop, 16, Burnaby-street, Oldham.—*Assistant-Secretary:* William A. Nash, 23, Queen's-road, Oldham.

OXFORD PHOTOGRAPHIC SOCIETY.—Established 1889. *President:* E. A. Ryman-Hall.—*Vice-Presidents:* C. C. Cole, A. F. Kerry, M.A., A. F. Stanley Kent, M.A., Councillor J. H. Salter.—*Committee:* N. G. French, W. J. King, G. W. Norton, H. M. Phillipps, W. H. Price, M.A., A. Robinson, G. A. Smith.—*Hon. Treasurer:* James Minn, 105, Walton-street.—*Hon. Secretaries:* F. A. Bellamy, 4, St. John's-road; H. Minn, 105, Walton-street. Official address, 136, High-street.

PHOTOGRAPHIC ASSOCIATION OF BROOKLYN.—March, 1887. *President:* Dr. E. H. Riedel.—*Vice-President:* E. F. Wagner.—*Committee:* Dr. E. Routh, Dr. F. A. Schlitz, W. Lang.—*Treasurer:* J. A. Gafney.—*Secretary:* Charles M. Heid, 54, Stone-street, N.Y. City.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.—Place of meeting for 1892, Edinburgh. *President for the year:* George Davison.—*Council:* W. Middleton Ashman (Bath), W. Bedford, *past President* (London), T. Berry (Aberdeen), J. J. Briginshaw (London), C. H. Bothamley (Taunton), F. A. Bridge (Dalston), A. A. Carnell (Plymouth), A. Cowan (Southgate), H. A. Hood Daniel (Bristol), R. P. Drage (London), F. Evans (Chester), A. L. Henderson (Lewisham), A. Haddon (Greenwich), M. J. Harding (Shrewsbury), H. M. Hastings (London), R. Keene (Derby), Austin J. King (Limpley Stoke), P. Lange (Liverpool), W. Lang, jun. (Glasgow), A. M. Levy (London), C. Phipps Lucas (Eltham), E. Marlow (Birmingham), G. Mason (Glasgow), A. Mackie (London), T. Mayne (Liverpool), W. W. Naunton (Shrewsbury), J. Porritt (Leicester), A. Pringle (Bexley Heath), B. J. Sayce (Liverpool), A. Seaman (Chesterfield), J. Smith (York), H. Sturmey (Coventry), J. Stuart (Glasgow), J. Traill Taylor (London), A. Tate (Belfast), J. M. Turnbull (Edinburgh), W. H. Walker (London), G. W. Webster (Chester), J. B. B. Wellington (Harrow), A. Werner (Dublin).—*Hon. Secretary:* F. P. Cembrano, jun., 10, Cambridge-gardens, Richmond, Surrey.

PHOTOGRAPHIC SOCIETY OF JAPAN.—Established 1889. Annual meeting is held in the month of May. Ordinary meetings are held about once a month, but there is neither fixed time nor place. *President:* His Excellency Viscount T. Enomoto.—*Vice-Presidents:* His Excellency Viscount N. Okabe, His Excellency H. Watahabe, Professor D. Kikuchi, M.A., Professor C. D. West, M.A.—*Committee:* All officers and K. Ogawa, Y. Ishizo, M. Kaljima, J. B. Rentiers.—*Treasurers:* A. J. Hare, Y. Isawa. *Secretaries:* Professor W. K. Burton, 9, Kaga Yashiki, Hongo, Tokio; Ishikawa, 218, Kanasuginura, Kitatoshigori, Tokio.

POLYTECHNIC PHOTOGRAPHIC SOCIETY.—Established 1891. Meetings are held first and third Fridays in the month at the Polytechnic, 309, Regent-street, at eight p.m. Annual general meeting in September. *Committee:* W. E. Brown, A. Crossley, O. J. Goose, F. J. Lock, J. E. Mothiron.—*Treasurer:* F. W. Jackson.—*Secretary:* Frederick R. Tissington, 105, Shafterbury-road, Crouch-hill, N.

QUEENSLAND AMATEUR PHOTOGRAPHIC SOCIETY.—Established 1888. Club room at Courier-buildings, Queen-street. Ordinary meetings held on first Friday in each month. *President:* F. R. Hall.—*Vice-Presidents:* J. Thomson, M.B., J. W. Sutton, D. T. Lyons.—*Committee:* W. J. Buzzacott, J. J. Knight, A. Clarke.—*Librarian:* E. H. Alder.—*Treasurer:* J. Campbell.—*Hon. Secretary:* A. R. L. Wright, Telegraph Chambers, Queen-street, Brisbane.

ROCHDALE AND DISTRICT PHOTOGRAPHIC SOCIETY.—Established 1890. *President:* John A. Bright, Esq., M.P.—*Committee:* Rev. T. P. Spedding, R. M. Jones, Beaumont, Blomley, Hoyle, O'Neill. *Treasurer:* Thomas Leach. *Secretaries:* W. and S. Ingham, 30, Freehold-street, Rochdale.

SOCIÉTÉ VERSAILLAISE DE PHOTOGRAPHIE.—Established 1884. Meetings on the first Tuesday of the month at the Town Hall. *President:* Maurice Bucquet.—*Vice-President:* Leon Ottenheim.—*Treasurer:* — Gavin.—*Secretary:* A. Hue, 28, Rue de Satory.

SOUTHPORT SOCIAL PHOTOGRAPHIC CLUB.—Meetings every Wednesday at Eight p.m., at Mr. Cross's studio, 15, Cambridge-arcade. *President:* Robert J. Parkes.—*Vice-Presidents:* Alfred Dunmore, A. Quayle.—*Committee:* Miss Unsworth, Miss Dunmore, J. R. Cave, G. Cross, C. Depree, J. C. Smith.—*Secretary and Treasurer:* G. R. Cartmel.

SYDENHAM CAMERA CLUB.—Established 1890. Meetings are held alternate Tuesdays at Eight p.m., at the headquarters, the Greyhound Hotel, Sydenham; outings during the summer months; annual meeting the last in the year. *President:* C. D. Budd.—*Council:* C. D. Budd, T. Cole, H. H. Gray, T. W. Rumble.—*Secretary and Treasurer:* H. H. Gray, 9, Thicket-road, Anerley, S. E.

TECH CAMERA CLUB.—Established 1890. Meetings on Saturday evening at Half-past Seven o'clock at the Institute; annual meeting at call of President. *President:* Edward H. Keith.—*Vice-President:* A. C. Higgins.—*Committee:* A. H. Smith, H. Sinclair, E. C. Kent, H. Bracken.—*Treasurer:* H. A. Coombs.—*Secretary:* E. W. Naill, jun., c/o W. P. J., Worcester, Mass., U.S.A.

WIGAN PHOTOGRAPHIC SOCIETY.—Established 1890. *President:* H. H. Wragg.—*Vice-President:* J. A. E. Lowe.—*Council:* Rev. J. S. Barnes, W. A. Varley, J. H. Atherton, R. Wardman, J. Smith, W. Heaton, F. Hughes.—*Secretary and Treasurer:* Fred. Betley, 11, Swinley-road, Wigan.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

ASTRONOMICAL PHOTOGRAPHY WITHOUT A TELESCOPE.

To the EDITOR.

SIR,—I thought at the time that Mr. Dallmeyer's wonderful new invention was nothing more than Barlow's lens. Now that we have heard Mr. Dallmeyer at the Camera Club, we see that it is so. If I mistake not, Jeremiah Horrocks used precisely the same combination when he obtained a shadow on paper of the first observed Transit of Venus, more than two centuries ago.—I am, yours, &c.,

HENRY ROGERS.

23, *Chancery-lane, January* 5, 1892.

THE PHOTOGRAPHIC SOCIETY.

To the EDITOR.

SIR,—Mr. H. P. Robinson gives the lie direct to Mr. Mackie's statement, confirmed, however, by the evidence and Mr. H. A. Lawrance, and crudely puts the matter as one of veracity on one side or the other. Does Mr. Robinson forget that he has (in *Photography* of the 24th ult.) admitted that he indicated the "place of honour," though he places it earlier in the day than the time at which he pointed out where he wished his own pictures hung on this favoured wall?

The mere selection by Mr. Robinson of a good place for his pictures is not in itself of much moment. They probably deserved, and would have obtained, a good position independently. The grand thing is that the Society has shaken off the system whereby an influential member could be present at and influence the hanging without his name appearing, or its being known to the members and exhibitors.—I am, yours, &c.,

January 4, 1892. W. E. DEBENHAM.

A NEW DEPARTURE IN PHOTOGRAPHY.

To the EDITOR.

SIR,—My attention has only to-day been called to the review of my book, on Gelatino-chloride Printing, in the *Daily Chronicle* of the 28th December, and to Mr. Howson's remarks thereon in your issue of to-day's date.

It is not my intention to enter into this controversy regarding the superiority of the various makes of gelatino-chloride papers, as I am not interested in the sale of any of them, nor am I in want of a cheap advertisement. But there is one point in Mr. Howson's letter which I feel must be cleared up at once. He explains that the reason why my book does not contain any mention of the Ilford paper is that only those papers are mentioned whose manufacturers paid for advertisement space therein.

I am willing to believe that this statement is due to Mr. Howson's ignorance of the fact that, when I was compiling the book in question, I

wrote to the Ilford Company, asking them to give me full particulars of their new paper, as I was anxious to make the work as complete as possible, and I received reply that they were not in a position to give me any particulars concerning their paper.

With regard to the appendix of the book I have nothing whatever to do. I did not know of its addition until after the publication of the book.

In the text, for which I am responsible, I do not think that I have given any undue prominence to any make of paper, and the only reason why the Ilford Company's production was not mentioned is entirely due to the cause already stated.—I am, yours, &c., WALTER E. WOODBURY.

Watford, January 1, 1892.

HAVE GELATINO-BROMIDE PLATES BENEFITED PHOTOGRAPHY?

To the EDITOR.

SIR,—I was glad to see your article on this subject, with most of the conclusions of which I find myself in perfect agreement; but, as to your concluding remark, relegating to uncertainty whether gelatine plates have benefited photographers themselves, I fear it is only too true that they have both directly and indirectly injured large numbers of them. Many who were *facile principes* with wet plates in all branches of work have quite failed to adapt themselves to the altered methods of procedure necessitated by gelatine. Contrary to what many would contend, this is their misfortune, and not their fault. The faculty of self-adaptation to all circumstances as they arise is not possessed in a larger degree by photographers than by other people, among whom, as we all know, it is none too highly developed. I am sure, Sir, most of us know several photographers of the old school whose businesses have steadily diminished since the introduction of gelatine plates, absolutely through no fault of their own. After all, I submit that the doctrines of the survival of the fittest, and that competition is the soul of trade, are cruel and inhuman in practice. In all revolutions, photographic or otherwise, somebody is bound to go to the wall, and this has certainly occurred in the case of gelatine plates. *En revanche*, finality is probably not yet reached. Who knows how soon gelatine plates themselves may share the fate of collodion?—I am, yours, &c., GEORGE WHITWORTH.

Seven Sisters-road, N., January 4, 1892.

BLISTERS.

To the EDITOR.

SIR,—Mr. Denmore writes, p. 15: "I feel convinced that the cause is in the preparation of the paper before it comes into the hands of the sensitiser," and so do I. Just a little evidence to confirm this opinion may be interesting. In a drawer in my den may be found a quantity of albumenised paper of a well-advertised, and therefore well-known, brand, purchased from a leading London dealer, who was requested to supply the best; the storage of the paper may be called equable, neither too hot, too cold, too dry, nor too damp; the sheets packed flat, and, having been at least a twelvemonth in my possession, may fairly meet the condition of seasoning by age. I will cut two pieces of paper from separate sheets, sensitise them together on a plain sixty grain silver bath, print under the same negative, wash, tone, and fix together in the same dishes, and, after transfer to the final washing water, I find one print suffering in the worst stage of a bad attack of small-pox, whilst the other is smooth, soft, glossy, perfect. It is quite just to the albumeniser of the "twinkle, twinkle" brand to admit that he can make good paper *when he likes*.

A brief and dogmatic paragraph (ALMANAC p. 575) was written for the numerous company of photographers, both professional and amateur, who pay for good paper and don't get it, and then—bless their innocence!—think the fault is all their own, and seek for and apply remedies, possible and impossible, whilst the albumeniser looks on and laughs in his sleeve. —I am, yours, &c., H. K.

Bishop Auckland, January 4, 1892.

HAS PHOTOGRAPHY BENEFITED ARTISTS?

To the EDITOR.

SIR,—If I might be allowed to make a few observations in reference to the "Flather *versus* Debenham" controversy, lately brought to a conclusion in your columns.

It seems evident to me, from the tone of Mr. Flather's letters, the last one especially, that there exists in some circles a suspicion that an outsider might not be fairly treated, or allowed the same privileges as other correspondents who have the interests of your JOURNAL at heart. But, in this instance, no one can doubt that you have given both sides an equal chance. Forgive me if I have entertained this notion myself, but I have seen good reasons for it in some of your contemporaries.

Perhaps this may, to some extent, account for some of the extraordinary assertions and arguments put forth by some of your correspondents under the heading of "Photography, and its claims to the title of Fine Art" remaining unrefuted. This one-sided state of things may be satisfactory to some biassed minds, but at the same time must deprive such articles of much real merit.

One portion of Mr. Flather's letter appears to have been lost sight of, and, with your permission, I will make some comments upon it, viz., Do the discoveries made by photographers in the use of photographic apparatus teach anything to artists?

Now, from an outsider's point of view, if one were to form an opinion of photographers in general from much that emanates from photographic societies, and even some professionals, one could only conclude that a more inconsistent body of men never existed. For while they are continually advocating the claims of photography to the elevation of fine art, they take up a most unaccountably hostile attitude towards artists themselves, who are really the promoters of what photographers claim to be the very essence of their own profession, and whilst anxious to assume the rank of artists before the public in general, seem to altogether discard the means by which such a position is attained, namely, qualification by art training; in fact, they want the honour without the hard work and study, and I think they find theory alone a very poor support in matters of real art.

How many photographers are there who even hold school certificates for model, freehand drawing, geometry, and perspective, or give any proof of mere elementary art training? How many are there who can retouch their own negatives (without spoiling them), or paint, colour, or otherwise finish their own enlargements in an artistic manner? But you will often find them trying to invent some sort of machine to do it.

And then the question arises, Do they teach artists anything?

They will tell you they are the artists, others are only painters, "wielders of the brush," &c.; pallette and brushes are machines. Of course, everything is mechanical to their eye, and who can be surprised?

One thing photographers seem to forget altogether, and that is, in practising photography they are making use of other peoples' brains instead of their own, and when a good result is obtained should not the maker of the lens come in for a share of the credit, or the dry plate maker? and is there no thanks due to scientists who, by their arduous studies and labours extending over a period of many years, have brought photography to what it now is?

Is there any credit in getting a good pose of a clever actor or actress? And is there any amount of brain power required in producing an *instantaneous study*?

Has it never occurred to these writers that if photography was a suitable medium for the production of works of art, that an artist could adopt those means himself without consulting a camera and lens proprietor? Why should they monopolise the credit of photography? Surely they don't pretend there would be any difficulty in the way of an artist making use of it. And, may I ask, in whose hands could it be expected to yield better results than those of an artist, whose eye, trained by genuine work, can see at a glance what another might practice all his life without seeing?

If you merit the title of artist by your works, no one can deprive you of it. But artists would be cheap indeed if the only qualification necessary were to join a photographic society and criticise the "*artist painter*."

I think myself that the time is not very far off when photographers will have to qualify themselves as artists, or take a back seat, and then perhaps we shall not see so many advertisements in the following style:—Wanted, a first-class operator and retoucher, clever with children (nurse the baby in principal's absence, wash the pots, &c.). None but competent men need apply. 30*s.* a week and a permanency to a steady man.—I am, yours, &c., ARTIST WITH BRUSH, PENCIL, AND CAMERA.

January 1, 1892.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 22,496.—"An Apparatus for Photographic Purposes." GRIFFITH DAVID HUGHES.—*Dated December 24, 1891.*

No. 22,510.—"Improvements in Photographic View Finders." CONRAD BECK and JOSEPH THACHER CLARKE.—*Dated December 24, 1891.*

No. 22,648.—"A Patent Carrier Frame and Dissolver for Single Optical Lanterns." J. E. CLARKSON.—*Dated December 28, 1891.*

No. 22,740.—"The 'Facile Princip' Camera. Improvement in Photographic Cameras." JOHN HENRY SMITH.—*Dated December 30, 1891.*

No. 22,758.—"An Improved Photographic Print Washer." GEORGE FREDERICK FIRTH.—*Dated December 30, 1891.*

No. 22,825.—"Improvements in the Method of and Means for Modelling by the aid of Photography." Complete specification. HERMANN PÖTSCHKE.—*Dated December 31, 1891.*

Exchange Column.

**** No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Will exchange 10×8 rapid rectilinear lens for six-inch condenser and limelight blow-through jet.—Address, SMITH & Co., High-street, Yeadon, near Leeds, Yorkshire.

Will exchange Rippingille's oil stove, for heating rooms (in good condition), for large skin rug and grass mat.—Address, H. W., 131, Graham-street, Penrith.

Wanted, 10×8 rapid rectilinear, or featherweight whole-plate camera; exchange, Oakley's patent Metamorphoser lantern and slides.—Address, F. COUCH, 11, Waterloo-crescent, Dover.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

ALCOHOL.—See our leader on the subject.

F.—Bromide of silver is soluble in ammonia.

LENS.—See Mr. Dallmeyer's paper in the present number of the JOURNAL.

GEO. LEIGHTON.—Mr. Clarke's address is 52, Queen's-road, Finsbury-park, N.

CHAS. IRWIN.—Lead is the best for the purpose. It is impervious to most reagents.

R. R. J.—You will find the subject of your communication dealt with in another column.

FELIX.—Try a lamp for burning magnesium ribbon sent out by Messrs Parkes, Son, & Rayment.

OPERATOR.—Print deeply, and use the chloride of lime toning bath given on page 788 of the current ALMANAC.

R. WALLIS.—Few, if any, professional photographers have given up the employment of pyro as a developing agent.

J. HUBERT.—As you are are personally outside the controversy, we think it better not to publish your letter. Thanks all the same.

PYRO.—The spots are evidently sulphide of silver, caused by hypo, probably in a powdered state, coming in contant with the negative.

BEXLEY HEATH.—It is a cleverly executed picture, but we cannot give the precise details beyond saying that it is done by a series of sliding vertical shutters.

A. M.—Two articles on *Photo-micrography*, by Mr. T. Charters White, pages 40 and 86 of the last volume of the JOURNAL, contain a great deal of useful information on the subject.

SCOTTY.—We do not clearly understand your description. If you send us a rough sketch, and indicate on it the aspect, we shall be pleased to advise you with regard to the design for the studio.

PALL MALL.—All publishers of photographic views supply views of the principal buildings in London. Any stationer, who supplies photographic views, if he has them not in stock, will procure any to order.

J. MATHEWS.—It is quite a matter of taste whether you use a solution of beeswax or French chalk for preparing the glass plates, to permit of removing the pictures after enamelling. Most persons employ the latter, because its application involves less trouble than the former.

D. ROBERTS.—If you have been making and selling an apparatus the same as that just patented, so much the worse for the patentee, for he has wasted his money on an invalid patent. He certainly cannot prevent you continuing to do what you did prior to his application for a patent.

L. GREY.—For potraiture by artificial light there is nothing to compare with the electric arc. If, however, your means will not permit of its adoption, you cannot do better than use magnesium, either as the flashlight, or by the combustion of the ribbon. The former is the most general *mode* just now. Excellent portraits can be obtained by its aid.

NOTTS complains very much that amateurs can obtain photographic materials at the same price as professionals, and considers that manufacturers should not supply any dealer, or any of the "stores" who do not make amateurs pay a higher price than they charge professional photographers.—This is quite a trade question to which there may be more than one side.

M. W.—From the description we doubt very much if the inconvenience is due to the use of the bichromate of potash. Usually, the first symptoms are violent itching of the skin at the back of and between the fingers, particularly at bedtime, or when the hands get unusually warm. Pains and swelling at the joints we have never heard of in connexion with the ill effects of the bichromate.

S. S. S. sends us a print from a negative of the interior of a church, and calls attention to a window showing in the picture that was at the side, and quite out of view of the lens. The window is fairly sharp and well pronounced. Our correspondent asks the cause of the "phenomenon?" The cause is a minute hole somewhere in the camera—probably the bellows—which has fulfilled the conditions of a "pinhole camera."

NEMO.—It is evident that the dark slides are not light-tight. They were, doubtless, made of ill-seasoned wood, and swelled with the damp; then you eased the shutters with glass paper. Consequently, when they became dry again, they no longer fitted the rabbets, and hence admitted light. If, instead of using the glass paper, the slide had been placed in a warm and dry place for a few days, they would have remedied themselves.

H. A. JACOBS.—The licence to use a still is 10s. a year, even for distilling water. It is quite possible to purify methylated spirit, but it is strictly against the law to do so. Any one doing it subjects himself to very heavy penalties, as well as forfeiture of all the appliances used. Any one licensed to use a still must admit the Excise officers at any time they choose to come, whether the still is in use at the time or not. Methylated spirit, free from mineral naphtha, can still be supplied for manufacturing purposes to those who have complied with the Excise regulations as to bond, &c., but only in large quantities, ten gallons being the minimum, we believe.

W. ALLWAY.—The Photographic Convention is not a society established to protect trade interests. You will have to take proceedings on your own account, if you are so advised. There is no assistants' association.

E. MARTIN.—We should recommend you to act on the advice of your solicitor. It is doubtful if, after the lapse of so long a time, you would recover any substantial damages from the infringers. The proper way would have been to have commenced summary proceedings at the time of publication for penalties. You might write to the Secretary of the Association mentioned, but it is somewhat doubtful if it would move in the matter now.

S. WARREN writes: "I have a lantern with four-and-a-quarter-inch condenser, fitted with a quarter-plate portrait lens. Can I use it for enlarging quarter-plate negatives to about fifteen by twelve, using the same lamp with which the lantern is fitted?—No; that is if the whole of the negative is to be enlarged, as the condenser will not evenly illuminate it. For enlarging a quarter-plate negative the condenser should be not less than five and a half inches in diameter to obtain even illumination.

S. W. writes: "I have just purchased, second-hand, a rolling press for 10×8 pictures, but the steel plate is very rusty, and the rust seems to have penetrated deeply into the metal. Will you please say how I can repolish it?"—If the plate is in the state described, we doubt very much if it can be repolished to be again serviceable. If time be of any value, it will certainly be much cheaper to purchase a new plate. Steel plates are supplied by all the dealers in printers' materials at a moderate price.

PHOTOGRAPHIC CLUB.—January 13, *Architectural Photography*. January 20, *Stereoscopic Photography*, Mr. J. Nesbit.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.—January 11, Exhibition of prize slides at half-past seven.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—January 14, Ordinary Meeting. January 21, Monthly Lantern Night. Visitors invited.

THE Richmond Camera Club will hold an Exhibition of Lantern Slides at the College Hall, Richmond, S.W., on January 15, followed by a musical entertainment.

THE West London Photographic Society's Exhibition opens to-day (Friday), and will be continued on Saturday. In the evening of the second day there will be a lantern exhibition.

THE LANTERN SOCIETY.—Meetings for January.—January 11, Commander C. E. Gladstone, R.N., on *Westminster Abbey*. January 25, Mr. C. F. Budenberg, of the firm of Schäffer & Budenberg, will give a paper on *Pressure Gauges*.

Mr. JONATHAN FALLOWFIELD writes: "Allow me to draw your special attention to what I think an interesting comparison of the prices of photographic chemicals in 1856 and 1892. Which of the photographic dealers can show a similar record from his own price lists?"

THE Fry Manufacturing Company are arranging a series of lectures and demonstrations for the next three months upon Bromide Enlarging, and the Manipulation of Rough Bromide Paper toned with Uraninm. Mr. Dresser will also give a lecture on Lantern-slide Making, and probably Mr. W. I. Chadwick one upon Stereoscopic Photography.

AT the last meeting of the North London Society, Mr. E. W. Parfitt exhibited a safety apparatus for oxygen ganges made for him by Mr. R. R. Beard. It consisted of a small device for closing the entrance to the gauge by a screw having a slight passage in the threads, which would prevent any sudden pressure. At the present time this contrivance should be extremely welcome.

HACKNEY PHOTOGRAPHIC SOCIETY.—January 14, Prize Slides; 28, *Autocopyist* Demonstration. February 11, *Illustrated Journalism*, Mr. T. C. Hepworth; 25, *On the Riviera* (lantern evening), Mr. A. L. Henderson. March 10, *Lenses, Points and Hints thereon*, Mr. W. P. Dando; 24, *Chemistry of Light*, Dr. Gerard Smith. April 14, *Isochromatic Plates* (Ilford), Mr. John Howson; 28, Members' Lantern Night and Auction. May 12, Annual Meeting.

CAMERA CLUB FIXTURES.—January 11, Elementary Lecture, No. 5 (postponed to this date from December 21), Mr. Lyonel Clark, on *Exposure*. 14, Mr. J. Howson, *The pros and cons of Chloride Printing*. 18, Evening for trial of slides. Members intending to bring slides are requested to notify the Hon. Secretary. 21, Mr. A. Maskell, *The Rendering of Quick Movement by Photography—Express Trains, Action of Animals, Movement of Waves and Clouds*. Illustrated. 25, Elementary Lecture, No. 6, by Mr. V. A. Corbould, *Silver Printing*. 28, Lantern evening. Series of slides by Lieut.-Colonel Gale. Other slides by members. February 1, smoking concert. 4, Mr. W. Willis, *Further Improvements in Platinotype*, with demonstration.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1654. Vol. XXXIX.—JANUARY 15, 1892.

EXHIBITION ETHICS.

Mr. P. H. Newman was one of the Judges at the last Photographic Society's Exhibition, and he performed similar functions at the Crystal Palace Exhibition, which was held earlier in the year. Thus qualified, he, the other evening, addressed the members of the London and Provincial Photographic Association on the subject of *Some Recent Exhibitions*. We print the paper elsewhere. It will repay perusal, by whomsoever in the world of photography it is read; and if it be studied, as it deserves to be studied, by those to whom its strictures and counsels are addressed, the author may, one day, have the unique satisfaction of realising that he has written with practical results. But in this case he will be exceptionally fortunate, and photographers will be swifter to accept good advice than they have hitherto been.

It is not every judge of a photographic exhibition that has the courage to lift the curtain in the manner that Mr. Newman has done, and he is therefore clearly entitled to our thanks—if only for the precedent he has been good enough to create. We should suppose, from this and other evidence, that Mr. Newman's connexion with photography is rather a recent one; indeed, it appears to us to unmistakably betray the fact. For instance, he allows that photographic exhibitions, if not unmixed blessings, are greater necessities than ever, if the amateur is to be recognised. Mr. Newman fails to indicate why exhibitions are more a necessity for the amateur than for the professional. He appears to think that in the long run the professional must beat the amateur badly; but he ought to know that in recent years, at any rate, the despised amateur's landscape work has, in particular instances, been of such a quality and order as to give rise to the wonder how the great majority of the exhibitions would have fared without it. It may be desirable that by exhibitions, medals, and competitions the amateur should gradually learn what he is made of, and how far he falls short of a high standard of excellence; but why limit these introspective opportunities to the unfortunate amateur? Are we to understand Mr. Newman as contending that such privileges are not needed or called for by professionals, and that these latter never require to be told how they fall short of a high standard of excellence? Mr. Newman's experience of photographic exhibitions must indeed be a meagre one to ensnare him into the expression of such narrow views and incomplete deductions.

We are quite at one with Mr. Newman in condemning the arrangement, or even the hanging of pictures on account of some fancied taste or eccentric novelty in the framing of them, and we trust with him that the light which he lets in upon the laxity displayed in the matter will obviate any recurrence of such proceedings. That at the now notorious Exhibition in Pall Mall last year a great many photographs were hung in defiance of their intrinsic claims to rigid exclusion, we lament also to have to agree with him; but this is, unfortunately, a feature not monopolised by the Photographic Society. We applaud the action of the Judges in drawing attention to the matter in their report, and we shall look with interest upon the effect which it will have upon future hanging committees in the elimination of photographs which never could have secured a place on the walls except through culpable neglect or favouritism, or absolute inability to discriminate between the good and the worthless.

Mr. Newman would lead us to infer that judges should look to the hanging committee for some guidance on the score of excellence of exhibits; but this is the first time we have heard that judges were desirous of having such information. To our thinking, the functions of a hanging committee are generally selective and not judicial, and the less "guidance" the judges have in the allotment of awards the better we think it will be for the impartiality of their distribution. To admit the principle that judges are entitled to regard pictures occupying the places of honour as attesting the good opinion of a hanging committee, and designed to assist them in arriving at their decisions, would, we think, seriously weaken the public confidence in the value and justice of those awards. As regards photographic exhibitions, the elements of discord are at present quite numerous enough without adding to them.

Mr. Newman's commendation of the disposition of pictures in groups, as adopted at the Crystal Palace, is a hint which with many others the Society would do well to weigh. In remarking upon the unsatisfactory position of retouching in relation to exhibition portraiture, he, whether consciously or not we do not know, places his finger upon a burning question which is in urgent need of settlement. Not merely in the interests of judges, but of exhibitors, of the public, nay, even of photography itself, it is high time that the exact place of retouching in portrait photography should be commonly agreed upon. When Mr. Newman frankly considers it wiser to recognise retouching as a necessity than to take up an attitude of indecision in regard to it, we think that he strikes what is the true keynote of the position; but we should also be pleased to have his views, as an artist and a judge, upon the morality, or even the expediency, of the touching up of the finished print, which has prevailed, and does prevail, to a great extent in photography.

Mr. Newman enters a plea in favour of tolerating photographs in exhibitions which pretend to be no other than more or less faithful memoranda of places and things. We devoutly hope Mr. Newman stands alone in this strange advocacy. If he was anxious to flood our exhibitions with the commonplace, the unimaginative, and the absolutely unlovely, he could not have chosen a better way to such an undesirable consummation.

A photograph of purely technical merit is out of place at a public display. Of what earthly charm or interest to the artistic public are the architectural drawings at the Royal Academy? But we have not space to follow Mr. Newman in this and other interesting points of discussion raised in his thoughtful and ably written paper. We cannot, however, conclude our article without regretting that he departed from his judicial *rôle* to strike in upon matters of purely personal interest, as he does in the last part of his paper. We had hoped that this unfortunate controversy would have died out without the intervention of those whom it least concerned.

DIRECT CARBON PRINTING.

A QUESTION that often suggests itself to some, when seeing the carbon process worked for the first time, is, why cannot the picture be developed upon the paper that carries the pigmented gelatine instead of having to transfer the coating to another support, and afterwards to a second one, if a non-reversed image be desired? At first sight the different transfers, simple though they be, appear to the novice an unnecessary complication. It is, however, quite possible to develop a carbon picture on the paper upon which the pigmented coating is supported, and thus do away with the operations known as single and double transfer. We say *possible;* but, when paper such as that now used in the manufacture of carbon tissue is employed, the thing can scarcely be considered as practicable.

Our reason for here referring to this phase of carbon printing is that a patent has been applied for, the specification of which has just been issued, for a method of obviating the trouble of transferring, and yet secure the image non-reversed by developing on the material which carries the sensitive gelatinous coating.

That the subject may be clearly understood by the uninitiated, we will first of all explain what takes place in carbon printing. The action of light is to render the bichromated gelatine insoluble in warm water in proportion to its action. The longer this is continued, the thicker is the layer that is rendered insoluble. In fact, the image of a finished carbon picture may be said to be built up of different thicknesses of the coloured gelatine. If the light were continued long enough, it would penetrate quite through the gelatinous film to the paper backing, so that it becomes firmly cemented to the insoluble gelatine, from which it cannot afterwards be separated by the warm water.

For some years the carbon process could only be used for line, and not for half-tone subjects. Then, in working, a thin layer of the sensitive gelatine was spread upon paper and exposed to light, until the film was rendered insoluble quite through where it was not protected by the negative. Then, by treatment with warm water, the unaltered portions forming the lights were dissolved away, leaving the others firmly fixed to the paper. Now, it will be understood that if a half-tone subject be similarly dealt with, although the deepest shadows may be fixed to the paper, those portions which represent the half-tones and delicate tints will have a soluble substratum of gelatine intervening between the paper backing and the thin layer made insoluble by the light's action. Consequently, the hot water dissolves this, and, the delicate, insoluble film having nothing to hold it together, the image floats away in pieces.

It was not until the late Mr. Blair and Mr. Burnett conceived the idea that, to obtain carbon pictures in half-tone, the washing away of the unaltered gelatine—the development of the image—must be effected from the opposite side to that exposed to the light, that is, the development must be from the back. Their method was to spread the pigmented gelatine on some transparent or translucent material, such as glass, mica, tracing, or other semi-transparent paper. The exposure was then made through the support, so that, when the print was treated with warm water, a print in half-tone was obtained direct. The drawback to this method was that the grain of the paper, when that material was used, interfered with the delicacy of the image. Talc or mica can only be had in very limited sizes, and glass, on account of its thickness, interferes with the sharpness of the print. Moreover, paper is the material upon which the majority of pictures are required.

Fargier spread the coloured gelatine on glass and exposed, then coated the film with collodion, which served to hold the image together during the development. It was afterwards floated on to paper or other material. Swan's first tissue was made upon collodionised glass, and, when dry, stripped off and exposed with the collodion next the negative. This was afterwards cemented to paper for development.

From the above it will be seen that the first carbon prints in half-tone were all made by a direct process. This method has now, however, been re-discovered. The object of the "invention" is stated to be the avoidance of the transfers. The method proposed is this: Instead of making the tissue on paper, it is to be made on thin sheets of mica, and exposure made through that, precisely as was done by Blair before the invention of Swan's process. Setting aside all questions of the validity of such a patent, if it is sealed, we fail to see what practical advantage there would be in this method of procedure, seeing that sheets of mica sufficiently perfect for photographic purposes can only be obtained a few inches in dimensions.

If it were desirable to produce carbon pictures on a transparent medium, as was done in the early days, with the object of avoiding the transfer operations, then xylonite or celluloid would be the best material to employ. It is cheap, can be had in large sheets of any thickness or thinness; furthermore, if a large demand for it were created—which is more than doubtful, at least, for this purpose—it could probably be supplied in continuous lengths, and then be coated by machinery, as in the case of paper. We just mention this application of xylonite, as it might otherwise some day form the subject of another patent.

PARA-AMIDOPHENOL IN COLD WEATHER.

WE recently called attention to the uncertainty that may arise in cold weather from the partial crystallisation of stock developing solutions, owing to a sudden or abnormal fall of temperature, a danger that is more likely to be experienced with concentrated solutions or those which approach the saturation point of the substance. With ferrous oxalate it has long been known, and more recently it has been found to arise with both hydroquinone and eikonogen; while pyro, from its extreme solubility at all temperatures, is practically free from it. Within the past week we have been warned that it is not improbable that para-amidophenol may cause more trouble in this respect than any of the developers mentioned, owing to its very low degree of solubility, even in the presence of alkali. Two bottles of stock solution of para-amidophenol and the

hydrochlorate, respectively made according to the formulæ given in a leading article a fortnight ago, and containing only three grains of the developing agent to each ounce, as well as a third, made, according to the formula of Dr. Eder, with caustic soda, published a few weeks back, were all found on examination to have deposited a crop of crystals, which, in view of the small quantity of material originally held in solution, might fairly be termed "copious." That the crystals consist mainly of the reducing agent is plain by their form, which differs utterly from that of any of the other ingredients, even if those were present in sufficient quantity to be likely to crystallise out, which they were not, the precipitate consisting of tufts of well-defined plates or prisms. It was noticeable, in the case of the para-amidophenol itself, which forms a brown solution, that the crystals thrown down were colourless, or practically so; whereas, before solution with the sulphite and alkali, they had a very dark colour. In this respect para-amidophenol resembles eikonogen, which, when discoloured, may be restored to its original state by recrystallisation from a solution of sodium sulphite. Those of our readers who may be using the new developer during the present cold weather will do well to keep the solution at a normal temperature.

COPYING POSITIVES.

In this, our concluding article on the topic, we intend to advert to some of the more difficult aspects of the work. From the outset it is understood that what is in view is the best reproduction of a given photograph, and this involves having to be satisfied with work which, on its own merits, is inartistic, though it may afford excellent groundwork for a skilful pencil to make into a presentable picture. Among the most frequent portraits of the class we speak of will be found what are often irreverently termed tintypes—glass positives on thin sheet metal, with a polished black-enamel surface. It is quite possible with such a positive, so under-exposed as to be almost worthless, to get a very fair copy by a plan now to be mentioned, which we have frequently practised, though we do not remember its having been hitherto described. It consists simply in treating the positive with bichloride of mercury in weak solution—say, about one per cent. This will bring into sight details not perceptible to the eye, and a copy can then be obtained which will give more detail than the original showed. The positive, after the operation, will probably have a bluish tint instead of white, but this will be no drawback, if not, indeed, a distinct advantage. But the greatest care must be taken before attempting the operation on an old positive, and an experimental trial on a worthless picture should first be made. The danger is in the film washing away as soon as it is moistened. To prevent such a *contretemps*, the plate must first be soaked for some time in methylated spirit containing ten per cent. of added water, and then gently placed in the dish containing the bichloride solution, which, again, after the whitening is complete, should be most carefully and gently washed out of the film before drying the picture. This is the plan we have always adopted when trying such an experiment, but, we must repeat, it is a risky process. It is possible that ether saturated with water might not affect the collodion, but it would need first to be tried, otherwise it is a good solvent of the bichloride. If the picture to be copied were varnished, we would advise its being left alone; still, if the visible image is so worthless that an attempt with the bichloride might be made, the varnish should be removed by immersing in spirit, which would be safest if diluted with five per cent. of water, and then in a second dish of spirit with five per cent. of ammonia solution added, and again a third similar soaking, followed by plain water. Shellac varnishes are mixable with water when a small quantity of ammonia is added.

Finally, all mercurially whitened positives should be varnished with a benzol varnish, say, for example, ten parts benzol, and one of dammar resin. There will occasionally—often, indeed—be needed copies of positives so over-exposed that the image is almost invisible. These, also, if the exposure be kept down, will copy "better than they look" in the usual way. But there is a better plan by far. This consists in treating the over-done picture as a negative. It is first placed in the usual receptacle for making lantern slides or enlarging negatives, and a transparency on collodion or a dry plate taken from it. It will be a very poor picture indeed that will not produce a transparency which is a startling improvement upon the original. From this transparency a negative may be obtained in any of the ways usually adopted where carbon work is done. Perhaps the simplest way is to take a deep carbon print and develop upon a glass support. The result will be a negative from which a print in every way superior to the original positive, even if enlarged several diameters, may be obtained. It may be observed that, as old glass positives are usually backed with black varnish, it will be necessary to scrape this entirely away before proceeding to make the transparency. But let the operator beware! Sometimes the black varnish is placed upon the collodion side, so that scraping the varnish off would mean destroying the picture.

We have, lastly, to consider paper prints. There is little fresh to say about them, as all photographers are familiar with the vagaries to which they are liable. Some operators prefer an all-round light to fall upon the print when copying, some a top light only, and others, again, a side light only. Any one by taking the same print in three different ways can choose for himself which he thinks the best, and in doing so will gain valuable knowledge.

We will conclude by an account of a very successful copying of a paper print we recently saw executed. A lady sent to a photographer an opal picture to be copied and enlarged, as it was the "best she ever had." She despatched it by post, protected by one piece of stiff cardboard, and put the postage-stamp just over a corner of the plate! The result need not be described, though the face was broken into not more than three fragments. A paper print, from the same negative evidently, was sent, but it was considered not good at all. Our advice was sought as to what was best to do under the circumstances. A very slight inspection showed what ought to be done. The paper print was clearly from the same negative, but exhibited the distortion through expansion in one direction of the wetted print, to as great a degree as we ever saw it; it was almost a caricature. By our advice the print was placed in a slanting direction for copying, instead of at right angles to the optical axis, so that the breadth would be reduced. Next, a swing-back camera was used, so that the focus could be accurately adjusted though the picture was not equidistant in all its parts from the lens, this same adjustment also tending still further to reduce the breadth. The resulting photograph was excellent, and we had the satisfaction of learning it greatly pleased the lady for whom it was executed. In conclusion, we hope that our excursus into one of the bye-ways of photo-

graphic operations may not be without both interest and instruction to many who have to undertake what is usually looked upon as a species of hard labour.

Mr. Bolas's Lecture.—The attendance at the first of the three lectures arranged by the Photographic Society of Great Britain was not so large as the well-wishers of the scheme must have hoped for, the number present being, we believe, under thirty. This is the more inexplicable and regrettable, since it is pretty generally known that Mr. Thomas Bolas, whether talking or writing, can always be followed with instructive results. The *Relations of Photography to the Industrial Arts* is a peculiarly appropriate theme in view of the Society's attitude towards the suggested technical institute. Mr. Bolas's ideas for securing facilities for the pursuit of experimental work to be furnished by the State were of a practical and cogent nature, and the further plea for the establishment of means for informing the manufacturer and commercialist as to what had been attempted or accomplished experimentally in any given direction is most happy in its originality and appositeness. By the way, in our report of the lecture the title is slightly wrong, the word "applications" should read "relations."

The New Methylated Spirit.—A correspondent of the *Chemical News* suggests that as the Revenue authorities have no object in view save the prevention of drinking alcohol, which has been allowed to pass duty free, they ought to be ready to allow the spirit to be sold to all persons who are ready to enter their names in a book kept by the retailer and open to inspection by the authorities. As an alternative, he suggests the issue of licences at a nominal charge. Both suggestions are reasonable, and conceived in the proper spirit of compromise. We again ask, When are the photographic societies going to stir in the matter?

Retirement of Mr. Glaisher.—At the meeting of the Photographic Society of Great Britain on Tuesday night, the Chairman (Mr. J. Spiller) announced that the President, Mr. Glaisher, had definitely decided not to allow himself to be nominated for office at the approaching anniversary meeting. Mr. Glaisher's retirement will mark the close of an official connexion with the Society of long duration and immense usefulness, and we are confident that in thus terminating his tenure of the Presidential chair he will be the recipient of wide and sincere regrets, accompanied by no less cordial thanks for the great services he has rendered the Society, and through it photography in general.

Photographic Society's Dinner.—It has been decided to hold a dinner of the Society on February 8, and the arrangements for it have been taken in hand by Mr. William England, than whom nobody is better fitted for such a duty. It is understood that on this occasion Mr. Glaisher, the retiring President, will occupy the chair, and, as this is the last time that he will be present with the Society in his official capacity, it will be a graceful act on the part of all members to endeavour to put in an appearance at the dinner. We therefore hope that this dinner will be made the occasion of a large attendance, and that the President will carry away with him the recollection of the warmest possible demonstrations of esteem from a goodly gathering of members and friends.

Support for the Society.—The earliest practical outcome of the affiliation scheme was shown at the last meeting of the London and Provincial Photographic Association. On that occasion Mr. P. H. Newman, at the conclusion of his lecture, touched upon some of the incidents in connexion with the late exhibition. This gave rise to a brief but animated discussion, and culminated in the passage, without dissent, of a resolution commending the action of the Society's officers in the late crisis. We are sure that the spontaneous support of the affiliated societies will do much to strengthen the hands of the parent Society in future.

"Honours" for Photographers.—Two or three "societies," founded for the encouragement of literature, science, and art, are at present touting for members in a manner not usually adopted by reputable representative bodies. They send you a high-flown communication, informing you of your election, and asking for your subscription; and, if this brings no response, they write other letters in the "name of the council," asking for the honour of adding your name to the roll of the society, and so forth. These so-called "societies" have for months past made photographers the objects of their particular attentions, and several of their circulars have reached us. We hope none of our friends have been rash enough to part with any subscriptions or promises of support to societies which anybody can see with half an eye are merely well-disguised commercial speculations.

Dr. Emerson.—Since his famous "renunciation" of last year, Dr. P. H. Emerson, the apostle of naturalistic photography, has disappeared from view. This disappearance, however, has served to bring out the Doctor's talents in another direction, as we gather from the book reviews that he has been very successful in a collection of "East Coast Yarns," published by Sampson Low & Co. This, perhaps, answers the question that has so frequently been asked of late, "What has become of Dr. Emerson?"

The "Daily Chronicle" Again.—The erudite gentleman who is responsible for the "Science Notes" in the Wednesday issues of the *Daily Chronicle* says that "a communication by Herr Waterhouse in Eder's *Jahrbuch* announces that positive photographs can be obtained direct from the camera by adding small quantities of a substituted sulpho-urea to the developer,' &c., &c. We humbly submit that science for the masses should be clearly written, and at least correctly expressed. Colonel Waterhouse's experiments were first published in these pages eighteen months ago. The *Daily Chronicle* is rapidly acquiring an unenviable reputation, not only for inaccurate, but for late news.

Large Cameras.—Mr. P. Meagher has recently completed a fine 22 × 22 in. brass-bound camera for the King of Siam. With a cone attachment, it has a focal length of twenty-two feet, for copying purposes. We are pleased to find such evidences of prosperity in the camera-making industry, conjoined to the recognition of the high merits of British products. We also learn that Messrs. Platt & Witte, of Kingsland, have recently completed a camera, to take plates 30 × 30, extending eight feet, which had four special-made screws, two of them being seven feet long. The bellows took fifteen of the largest skins of leather that could be bought, and when completed the camera weighed about four cwt.

THE ORIGINATOR OF THE GELATINO-BROMIDE PROCESS.

A FRIEND has just called my attention to a dreadful outbreak of "Peckhamism" in the pages of one of your contemporaries, and has placed me in possession of the correspondence that has been going on on the subject for some weeks past. It seems that Mr. J. Burgess, assisted by a few friends, anonymous and otherwise unknown, is once more attempting to show that he, and he alone, is the great pioneer of gelatine photography, the inference being that he, and not Dr. Maddox, should be the recipient of the "coming-of-age" testimonial. I say again, because some ten or eleven years ago he made the same attempt, and used pretty much the same arguments; but on this occasion the fight is being carried on with greater vigour and more virulence.

As one of the earliest experimenters with gelatino-bromide, and well acquainted with its early history as well as with the various individuals concerned in its development, and, moreover, having had special opportunities of knowing the facts of the case, I may perhaps be allowed to say a few words in order to put the matter in a proper

light before the numerous users of gelatine plates whose recollection of photography does not date back to 1871.

In the first place, it is attempted to make capital out of the fact that gelatine emulsions had frequently been mentioned before 1871, and that therefore Dr. Maddox has no claim to any more than passing mention as a casual experimentalist—if, indeed, as much. The same argument holds good, of course, against Burgess; but his friends do not say so. Dr. Maddox never claimed, nor has it ever been claimed for him, that he was the originator of the idea of gelatine emulsion; on the contrary, in his first publication he expressly said it was not new. But what is claimed for him is that he was the first to publish a practical and workable formula—not perfect by far, it is true—and to show results produced by it. For the very earliest mention of gelatine emulsions we should have to go back to pre-collodion days, for Bingham, in his work on photography, published previous to 1850, mentions gelatine as one of the possible vehicles in which to suspend the sensitive salts. Le Gray and Scott Archer both, if I remember rightly, attempted to utilise it, and, later, Gaudin and others; but none of them gave any definite formula. In 1865 Palmer patented a gelatino-chloride emulsion for printing purposes; but nothing much was ever heard of that, and it remained for Dr. Maddox to strike the real keynote.

It is said that Maddox's process or formula was not for negatives, but merely for printing upon paper, and required some minutes' exposure in the printing frame. This is a mis-statement that is as culpable in its recklessness as if it were deliberate. In his first notes communicated to Mr. Taylor, Dr. Maddox certainly does speak of paper, though the fact of negatives having been exhibited at the Inventions Exhibition—a fact known to Burgess and his friends—clearly proves the falsity of the statement.

However, the existence of those negatives proves nothing to the supporters of Burgess, for one of them would like to know "where the negatives exhibited on behalf of Dr. Maddox, and for which he was awarded a medal, came from," and opines that the jury who awarded that medal had been greatly misinformed as to the facts. I pass over the imputation this involves, for I am fortunately able to prove the authenticity of those negatives beyond a doubt. In 1880, while the previous correspondence on the subject was proceeding, Dr. Maddox happened to remark to me in the editorial office, at York-street, that some of his original negatives had been left there with Mr. Taylor; as there was a considerable accumulation of such things on the shelves, I proposed a search, and it was not long before we came upon two or three quarter-plate negatives bearing the particulars and *date, September*, 1871, *in Dr. Maddox's handwriting*. There could be little doubt as to their genuineness under those circumstances, and, after lying *perdus* there for nine years, they served to prove in a most emphatic manner that Maddox's process *was* a negative process, and capable of giving results of a very satisfactory character. Those negatives, with, I believe, some others that Dr. Maddox subsequently found, he having been absent from England for some years, formed the exhibit for which the medal was awarded.

The suggestion that the jury had been misled comes singularly unfortunately for the Burgess's side. At least, three of the members had been closely identified with gelatine emulsion as practical experimentalists from the first and through every stage of its progress, and were not likely to have to go far for information as to its history. With the exception of two, the rest of the jury were all old members of the Council of the Photographic Society, and as such were fully cognisant of all that had passed in connexion with the subject. And yet that jury awarded a gold medal to Dr. Maddox without dreaming of Burgess.

And now let us consider what Mr. Burgess himself has done in contradistinction to what he claims. "In 1873 an emulsion was put into the market quite perfect, and for ordinary purposes as good as any made now." "Burgess made an original discovery by going on lines never tried before. He washed the sensitive jelly instead of the plates . . . ." Such are some of the claims. Well, in 1873 I had the pleasure (?) of trying some of the emulsion, or rather the disappointment of not being able to try it. It was so "perfect" that it would not stand the journey between Peckham and Liverpool; in other words, it was decomposed within a few hours of being sent out. Set this against all the talk about the worthlessness of Dr. Maddox's formula! Then turn to the "original discovery," washing the sensitive jelly. Burgess never claimed to have done anything of the sort until seven years after he first tried to sell his emulsion; indeed, it was not until 1880 that he made a single statement with regard to his method, and at that time, it is needless to say, every one knew how to wash an emulsion.

Absolutely all that he had published up to then consisted of advertisements of his emulsion, which he soon had to drop, then his plates, together with an offer to impart the secret of his process to 500 subscribers of one guinea each. He did not even speak of it as gelatine, but left the purchasers to find out what it was as well as how to use it. After finding the emulsion would not sell because it would not keep, he tried plate-making, and, surely, if he were the great "discoverer," who has taught everybody all they know of gelatine emulsion, one would have imagined that he was in a fair way to fortune. But not so. With the greatest thing that has ever cropped up in photography within his fingers, he let it slip his grasp, apparently from sheer want of knowledge of how to work it. He had Dr. Maddox's idea, but failed to carry it out.

In the course of the present discussion, and previously in 1880, the most extraordinary statement has been made and repeated, that Mr. Kennett learnt from him his process, and then went to the patent office, and took out a patent. This is Mr. Burgess's direct statement, not a mere insinuation. Mr. Kennett, the late Mr. le Neve Foster, and "some venerable clergyman" (in all probability the late Rev. J. G. Cowan, a great friend of Mr. Foster's) were at his house one day, and he showed them his process, and Mr. Kennett afterwards took out a patent for it. It is not a very likely story, nor does it reflect much credit on his wisdom as a commercial man to be so ready to divulge his secrets to any and everybody. I think Mr. Kennett would have had to possess a "stronger" conscience than I even gave him credit for to have gone off and patented another man's idea, with the full knowledge that two of his friends, both honourable gentlemen, were aware of his dishonesty.

But Mr. Kennett's version of matters is slightly different. He had been experimenting with gelatine emulsion off and on for some years, and had got his process into workable form, but held it back, doubting if there would be market enough for it to recoup him for the necessary outlay in starting it commercially. When Burgess's emulsion was advertised he wrote for a sample, stating that he had been experimenting in the same direction, and subsequently went to see Burgess on his invitation. He found the latter in trouble with his emulsion, and about to start plate-making, and, apparently, altogether at sea. If I remember rightly—for I am going on the recollection of a conversation of ten or eleven years ago—there was a suggestion on Burgess's part that they should work together; but, apparently, Kennett did not think it "good enough." The attention that attempted introduction of the new emulsion had attracted showed him there was an opening for it, and he then took out his patent.

Kennett's patent, by the way, was solely for the drying of the sensitive emulsion, to enable it to be kept, and, in spite of the patent—surreptitiously taken—Burgess made no claim to its being his until 1880, seven years later, a most extraordinary *lapsus* on the part of one who then and now claims so much.

Not succeeding at making plates, in the latter part of 1873 Burgess sold his process, such as it was, to Mr. Mawdsley, of the Liverpool Dry Plate Company, but I do not think he ever succeeded in doing anything with it. He certainly advertised gelatine plates in the ALMANAC for 1874, but had scarcely time to try the process before the work went to press, and the advertisement did not reappear the following year, nor, indeed, did Mawdsley go in for gelatine plates until after the publication of Bennett's method in 1878. Surely, again, if a practical man like Mawdsley could do nothing with the process, it was not worth much.

Finally, in 1880, Mr. Burgess became connected with Messrs. W. T. Morgan & Co. in the introduction of gelatino-bromide paper, and wrote a pamphlet for them. But they soon severed the connexion, and then it was that Burgess commenced to put forward his extraordinary claims. Then, as now, the arrogant and insulting tone in which he alluded to Dr. Maddox, and every one who had anything to do with gelatine, went far to alienate from him any sympathy that

might have been felt for him as an unsuccessful "inventor," and then, as now, I felt compelled to point out the fallacy of his claims.

Though my own experience with the emulsion was unfortunate, I am quite willing to, and do believe, that some of the emulsion and plates he issued were of good quality, for otherwise they could not have secured the notice they did. But to put himself forward as the "originator"—his own word—of gelatino-bromide, when he came just two years after the publication of Dr. Maddox's formula, is preposterous. To pose as a benefactor to photography when he never published one atom of information, and failed even to benefit himself, or as an ill-used individual because Dr. Maddox, and not he, is to get a testimonial is supremely ridiculous, and it is surprising that any one with the facts within reach, and well up in the literature of the subject, should be found to abet him.

W. B. Bolton.

AMERICAN NOTES AND NEWS.

Printing-out Platinotype.—One of our American contemporaries having suggested that the platinotype patents in America were on the point of expiration, Mr. Alfred Clements writes to *Anthony's Bulletin* to correct the misleading statement. Incidentally he makes the interesting announcement that a printing-out process in platinum has long been in the mind of Mr. Willis, and that hundreds of experiments have been made by him in that direction, but the many difficulties in the way make it almost impossible to ever get a perfect process of this kind. We are sorry to hear this. An indefatigable experimentalist like Mr. Willis would, we should have thought, have been able to equal the efforts of our Continental rivals, if not surpass them. Mr. Clements is surely not ignorant of the fact that printing-out platinum papers have long been in use.

Interesting to Lanternists.—Discussing the recent lantern explosions, *Anthony* points out that in the case of a bag the explosive force is exerted in all directions, whereas, in the case of a cylinder, there is seldom more damage done than the blowing out of the gauge or plug, as happened in London a short time since. Mr. F. A. Bridge will be glad to know that "in this instance, too, the accident was wholly due to the carelessness of the operator, who opened the valve suddenly, and allowed the full pressure of the stored gas to accumulate in the pressure gauge at once." This is hardly correct. On the occasion referred to something else besides the destruction of the gauge took place, and, according to expert testimony, the cause of the accident was not that above assigned for it.

Photographing Chinese Immigrants.—America, by which we mean the United States, is a free country, but the authorities there will not permit free entry into that country of every one so disposed. Amongst others, the Chinese are debarred admission, except under certain restrictions. The word has been passed that at the ports of entry into the States from Canada photographs shall be taken of all Chinamen arrested for unlawful entry into the United States, for subsequent identification of those who return after having been deported to Canada.

Large Panoramic Pictures.—At a recent meeting of the Society of Amateur Photographers of New York, two panoramic pictures taken upon Carbutt flexible films were exhibited. They were made on colour-sensitive films with a Ross lens of fifteen inches focus in a Moessard panoramic camera. The length of each picture was forty-eight inches, and Mr. Carbutt hoped soon to get a film of larger size, some seventy-five inches, or even longer. The angle included was said to be 165°. The pictures were perfectly sharp, being made with the lens working at *f*-64.

Camerists versus Photographers.—We learn from a New York daily, the *Times*, that the term "camerists" as applied to amateur photographers to distinguish them from the professionals, has apparently, to use a familiar expression, "caught on." For a long time the amateurs felt that some name should be adopted which would be appropriate and suggestive of the art as well as clearly separating them from the professionals. The word "photographer" invariably brought to mind the man who, after fussing for fifteen minutes behind a curious-looking instrument shrouded in a black cloth, would cry out, "Now, look pleasant," and then, watch in hand, would keep the sitter in a state of mental distraction for what seemed several minutes, and then, perhaps, remove the plate-holder and retire to his closet, without even telling the sitter that the terrible ordeal was over, and that he could resume his normal cast of countenance if he chose.

English versus American Plates.—Mr. Francis B. Troup, who is, we presume, an American amateur, writes to the *Photographic Times* to complain that during a residence in the dampest corner of England (wherever that may be) all his plates were so affected by the damp that they were useless for securing good negatives. So far so good. "But mark," he says, "my experience with American plates." Here he goes on to say that he imported some of Mr. Carbutt's plates. These were sent to him specially packed for the sea voyage, of course, but he accidentally left a box in his dark room for a month during the rainiest weather he ever experienced in England. He tried them against an English brand which had also been in the room for a month, with the result that the Carbutt plates were excellent, and the others not worth printing. "It was a severe test, but the plucky Americans stood it so well," &c., &c. If this means anything at all, it is that an American gelatine plate is impervious to the effects of damp, and that an English plate is not. Fiddlesticks, Mr. Troup!

The late W. Notman.—From *Wilson's Photographic Magazine* we learn that the death of William Notman, of Montreal, recorded in our last "American Notes," was more sudden than we were aware of. Only ten days before his death he was in New York in apparent good health, forming plans for photographing at the coming World's Fair at Chicago. Mr. Notman, says our contemporary, was one of the first artists in our profession. Being an educated painter first, he was always able to produce work of the highest photographic character, and to win fame and fortune. He was a leader in style as well as in art, and conducted successfully many great enterprises, among which was the long line of remarkable panoramic views of the Canadian Pacific Railway. His death is a loss to us all.

Pictorial Criticism.—A feature in connexion with criticism not known, or not, at any rate, yet practised in this country, has been adopted in *Wilson's Magazine*. A picture is published, and the criticisms of the readers on it are invited. The one which is now "on" is entitled, *By the Still Waters*, and opinions on its composition, treatment, and general merits are freely given by brother artists. As might be supposed, they are somewhat conflicting. The idea strikes us as being a good one.

Solution of Celluloid.—A contemporary says that solution of celluloid may readily be prepared that will prove useful for coating trays or other dishes, and that will resist the action of acids and alkalies, by taking spoiled celluloid films, and, after removing the emulsion, dissolving them in fifty times their bulk of amyl acetate. The celluloid solution serves admirably as a varnish for negatives.

A Large Portrait.—The portrait of the delightful Irish, *not* American, actress, Miss Ada Rehan, which hangs in the *foyer* of Daly's Theatre, New York, is said to be the largest photograph in the world, measuring about $7 \times 3\frac{1}{2}$ feet. It depicts the lady in her impersonation of "Rosalind," and is the work of M. Walery, of London.

Photography at the World's Fair.—The Christmas number of the *Photographic Times* deserves special notice. It contains a pictorial frontispiece, and three other pages of illustrations; the initial letters of the articles are printed in red, and appended to each article is not only the signature, but a neat little woodcut of several of the writers. From it we learn, on the authority of Mr. Gentile, the probable Superintendent of the Photographic Department

of the World's Columbian Exposition at Chicago, that photography is not to have a building devoted entirely to it at the World's Fair, but will be classed under the department of Liberal Arts.

SOME RECENT EXHIBITIONS.

[A Paper read before the London and Provincial Photographic Association.]

I SUPPOSE it is anticipated by most sanguine persons that the exhibitions of photographs which take place annually should indicate a steady advance in some directions by the numerous branches of that seductive and scientific art, and I trust that the sanguine people have not been disappointed this year which we have just undergone. I cannot individually say enjoyed, because I regret to admit that the weather and the "crops" of photographs alike last season did not come up to my expectations, though I am not a sanguine person. One reason, of course, may be—and I am more than willing to admit it—that I belong to that very small body of critics who do not know everything about photography; and, while I regret this exceedingly, and am duly ashamed, I am sensible that, were I better informed, I should be able to dwell upon and enlarge for your behoof this evening on some new process or paper, methods of printing, toning, developing, perspective, or para-amidophenol fad, which counterbalanced and entirely outweighed any general shortcomings in the recent exhibitions that might be expected to have vexed our righteous souls; but, alas! these lights are denied me, and when it was suggested to me to say something to-night to you, and to take the recent exhibitions as a topic, I had almost replied with the monosyllable "No;" but I fortunately remembered in time that no member of your Society could take a negative that would not print, and so I consented to say something about the exhibitions; and if, in this case, *Nil nisi bonum* will scarcely apply, at least we will see if we cannot get some good out of them. Now, there are those among that limited class who do not know everything, and of whom we have been thinking—some who rejoice, and would even make a virtue of their ignorance, especially on the question, if it were put to them emphatically, of what on earth was the reason some of the exhibitions existed for at all, and what, in the name of fate or fatuity, some of the exhibitors had to exhibit? These questions are at once so startling and so shocking that they, doubtless, deserve to remain unanswered; but, yet, we must not ungenerously leave the aforesaid limited class in its ignorance; and so, with your permission, we will advise them to reply to the pessimistic and blatant questioners that their questions are offensive to the professors of a wisdom that recognises that there are and will be, for a year or two to come, more things in heaven and earth than all philosophies are equal to, and, moreover, regret that the said questioners are probably as lamentably obtuse to the universal fitness or "cuteness" of things in general, as they are to the disguised blessings of photographic exhibitions in particular.

"And wish them not reply,
For thou must give the lie."

or, if we would not be quite so rude as the ancient and pessimistic poet, suggest that their ungrateful fuming and foaming be quieted by pointing out that there is an end of all things, even to a tether, for, when a tether is at its full length, and stretched to the uttermost, it breaks. Now, it is quite obvious that the length of tether already arrived at by some sublunary institutions—I am afraid I cannot include the weather—but say, for example, the School Board and some photographic exhibitions, the tension is such that fracture must be imminent, when will come the relief we, as well as our impatient or ignorant friends, so much desire.

I did not see many exhibitions last year, so perhaps my sufferings are despised by those who saw more than myself: but suffering is a relative question, and mine were severe enough; yet I will attempt, if strength serve me, to cull the flower health from the upas disease—to slightly paraphrase the bard—and thus, at least, escape your objurgation, if not gain your thanks. Seeing what a task is before me, yet feeling that the case is not hopeless, I, relying on your just consideration, say at once, Come, then, let us reason together.

I venture to premise that, even in these pattern-making days, there are bad years and good years in most things, besides the weather or the crops, and, in support of this assertion, should doubt arise, I will admit that I have known a year (but this is a secret, and only to be whispered in the strictest confidence), a year, I say, when the exhibition of the Royal——oh! ah! I see, you guess: well, when you know, it must be allowed that it was just a trifle below the average. Indeed, I believe, in connexion with annuals (I should have said *eternals*), that more than one of the reputable old classics nod sometimes, and I would, in this same connexion, ask you, Shall we grudge the forty, or even fifty, winks now and again to those who have done so much to amuse, edify, or even astonish us, and disallow a similar somnolent licence to exhibitions that are neither Royal nor Academic? But I think I hear you saying you have been a judge, and you are now talking like counsel for the defence, or a special pleader. Well, perhaps you are right, and all I can reply is, a judge is not of much account if he cannot see both sides of the case; and this last year I have seen the ins and outs of so many cases—in fact, turned them inside out, so to speak—and there is one special case I may mention, part heard *in camera*, and in which I am rather glad I have had nothing to do with the ruling. This, you are aware, was a police case, and I am sure we must all rejoice that it has been settled out of court.

I think it is now high time we began to consider the relative merits of some of the exhibitions, and what their value may be to both the professional and amateur photographer, and how, if possible, that value may be improved.

Firstly, photographic exhibitions, if not unmixed blessings, as we partly suspect, are, in the present condition of the art, greater necessities than ever, especially so if the amateur is to be recognised; and as he or she, like another class "is always with us," the amateur will be recognised. I think it is expedient also that he should be medalled, for, after all that can be urged, it has never seemed to me that the professional photographer has really much cause of objection to the amateur, because not only does he tend to popularise photography by his efforts, but his very failures increase the popularity and appreciation of really good photographs, and thus adds to the chances of the professional, who, in the long run, and having the start of the amateur, must, in the nature of things, generally beat him badly. Moreover, it is from the ranks of the amateurs—diligent, absorbed, and therefore most successful amateurs—that the ranks of the professionals are best filled. Now, granted that the necessity, and even virtues, of the amateur are recognised, it is desirable that by exhibitions, medals, and competitions, the amateur should gradually learn what he is made of, and how far he falls short of a high standard of excellence.

But here, I must admit, we are met by the great and principal difficulty, for while, on the one hand, it is obviously desirable to encourage the amateur by allowing him the indulgence in the pardonable human weakness, a little vain glory, dear alike to himself and his appreciative relatives—no inconsiderable public, by the way—it is equally necessary not to give false impressions of perfection in his performances, that a too indiscriminate awarding of prizes and medals must foster. I have seen something too much of this last year, and must not neglect an opportunity of dwelling upon it.

While saying that I think photographic exhibitions are greater necessities than ever, I am distinctly of opinion that we are having rather too many of them, similarly that we have too many exhibitions of paintings for the real benefit of art. The output may be great, but the quality has to be considered, and this often suffers, I find, in the ratio of the output when it exceeds reasonable limits.

We have two very important exhibitions of photographs annually, practically in London—I mean in Pall Mall and the Crystal Palace—and it is to these two exhibitions I propose now to confine my remarks, as to my mind they are more than extensive enough to absord all the good work of the year. I mean, of course, by this all the work that is worthy a place in an exhibition that puts itself on competitive terms with the best photography in the world.

The Crystal Palace Exhibition last year, I have been solemnly assured in some high places, was "below the average." I am very glad to hear it, as it speaks very hopefully of photography, and I do not regret in the least the suffering I endured on that ever-to-be-remembered head-splitting day on which I was allowed the privilege of being a judge of so much high-class work—work, I should observe, that was placed equally to the advantage of itself, the exhibition generally, and the judges. It might be a pleasure, instead of an agony, to judge such a collection of photographs if the Crystal Palace authorities would only let us see the exhibition at some time when the public were not present; but as it is, it is an infliction of such inconceivable torture to those who have not experienced it, that I have no hesitation in saying that, should I ever be honoured by being asked to be a juror again at the Crystal Palace, I should much prefer to fulfil the office on a Sunday, when any conscientious qualms or scruples would be more than set aside by the knowledge that, in attending on that day, I was participating in an act of mercy to my co-jurors. Comparisons are notoriously odious, nevertheless they must be made sometimes, and I must say that, in spite of the physical objections to being a juror at the Crystal Palace, where one is bewildered by the incessant crowd, and choked by the insidious dust, it is a far pleasanter task to do the actual judging at Sydenham than at the

exhibition in Pall Mall; and the reason of this is the principal reason for my inflicting on you this address to-night, and drawing your attention to what I conceive as an important consideration. It is not the question of the photographs themselves, although I shall have more to say on that subject presently, so much as the arrangements at the respective exhibitions.

I may be answered, "But see the space at command at the Crystal Palace." Well and good; I will attend to that also presently. But, now, at the Pall Mall Exhibition, in the years that I have seen it, it has been difficult to find any arrangement at all. This year, at least, I am confident there was none worth mentioning. A juror entering, for the first time, the exhibition room of the Photographic Society of Great Britain will naturally say to himself, "This is, or should be, by its traditions, the most important exhibition in the country;" and, if he has any honesty, as it is usual to suppose a juror may have, he will endeavour to fix in his own mind a certain definite standard of excellence before he goes to the question of awards. He may, if it be conceded that he is honest, have some allowable misgivings on the point of excellence, and he may not unnaturally turn to the works and seek in the places of honour—supposedly the centres of some of the walls—for guidance by what the hangers may have considered worthy of this distinction. Now, I have no hesitation in saying that last year, in an important class of work, the juror so doing would have been more at sea than ever. (I will spare both pictures and names, making no invidious references; but those who saw that exhibition, and remember the localities of the various works, must, I think, bear one out that a system that might be supposed to lead to the finding of excellence in certain places, was "more honoured in the breach than in the observance."

A querist, addressing himself to the officials for explanation, was met by the inevitable reply, 'Well, you see, the handsome framing has a good deal to do with the arrangement.' Of course, in what I have stated I am not including one conspicuous, not to say notorious, series of photographs which should have been judged *sui generis*, and to which I shall have to allude subsequently. So that one finds that the most important consideration of the most important photographic exhibition in the country is the consideration of handsome framing. I frankly admit that one's heart sinks within one at the contemplation of such a state of things in London at this time. Such, however, was my experience; and, coupled with your own observations of the exhibition, which can scarcely be favourable, I think I am justified in pressing on the attention of this important photographic society, known widely as it is as the London and Provincial, to see if some steps cannot be taken to prevent, if possible, a recurrence of a system of hanging which cannot do other than injuriously affect the whole of your profession. Such a system of hanging, in conjunction with the permission of monstrous and ridiculous framing, as we have witnessed this last year in Pall Mall, can scarcely be conceived to have arisen from ignorance, and yet it seems more serious still to attribute the cause to a *laissez-faire* indolence in the leading society of Great Britain. However, thus is forced upon one the comparison with the Crystal Palace Exhibition, which, with all its drawbacks, has an admirable arrangement of getting the exhibits into groups in sheltered bays, a system undoubtedly necessitated by the natural conditions at the Crystal Palace, but which, I submit, is absolutely necessary anywhere for the due enjoyment or criticism of small works, such as photographs. I do not suppose that the Pall Mall folks would entertain the idea of such a system for a moment, but probably say that it was not possible in their room. I am, however, not so sure of this, and, if attempted, the sides of the bays might be so hinged as to set forward to a stop for the convenience of the lantern shows in the evenings without disturbing the frames in the least degree. I argue that such a system of top-lighted bays allows of adequate classification, allows a better display of each exhibit, giving more room than at present, and permits that concentration on individual work which I insist is absolutely necessary to its enjoyment or criticism, and which is quite impossible with the distracting influences of a large wall.

If it be advanced that such an arrangement as I have described cuts up the room, detracting from its general effect, I answer this is immaterial. You can make no large room look well by covering its walls to seven or eight feet high with a mixed collection of photographs, however mounted and however hung; even supposing the room were so spoiled in general effect, this, I again contend, is of no consequence to the main purposes of the exhibition. Furthermore, I am of opinion that the exhibition being at present quite large enough in point of numbers, the arrangement I propose would allow of the photographs being adequately mounted, which cannot be the case under present conditions. We all know that small works of art of any kind gain immensely by a good width of margin, as it assists the riveting of the attention, the enjoyment being proportionate in the same degree as lantern exhibitions, which are not a little dependent for their success on this condition of the isolation of the picture, and consequent consecration of our attention.* One lesson is distinctly derivable from these two exhibitions, and I hope that I may be able to impress it as forcibly on this society as I feel it myself—it is the anomalous position which portrait and figure photography continues to occupy. I am aware that my point of view has been a matter of consideration, and has even caused dispute over and over again; still I find matters remain very nearly as they were, at least as to the question of judgments or awards, and I would once more ask, What is to be the decision on the subject of retouching?—for it is really important. One looks at a good portrait or series of portraits, and expresses genuine admiration for pose, light, and shade, besides other artistic qualities, yet your better technically informed co-juror smiles, and at once says, "Ah! yes; but you know half of it is retouching." Fatal word, and dreadfully cold water to be douched with so constantly, calculated to discourage the hope for ever of any advance in photographic portraiture; but what is the result? You are obliged to give some medals, and what do you give them for? I venture to say, that it frequently happens nobody knows but the lucky photographer, who, as often as not, laughs in his sleeve. If the work of portraiture is to be judged on its photographic merits, plus excellence of subject and pose, it is time the judges were allowed an inspection of the negative. If this is not thought to be desirable or convenient, surely there can be no objection to sending with every work of the kind for competition a first proof before retouching or even spotting has been attempted; this proof not necessarily for exhibition, but for the use of the judges. Nothing, at any rate, can be more unsatisfactory than the present state of the case, which demands some better means of criticism being in the hands of the judges for them to be either consistent, or, with their best endeavours, fair. Of course, it would be a most desirable thing if, in all cases, photographs of a head could be obtained without retouching; but, although this may be possible in some limited instances, I fear that with certain types—female especially—that even in these days of orthochromatic plates, and granting—which is very unlikely—the protracted exposure incidental to the use of the yellow-glass screen, the desideratum will hardly be attained. I cannot help thinking it would be wiser to recognise retouching as a necessity than to burke its consideration, or wink at it, as is the undecided plan at present adopted.

One thing is certain, commercial portraiture is, and probably must remain, impossible without retouching, and if it were recognised as an art, as its importance demands, it would be far more likely to be confined to artistic limits, as we see in such rare instances, than transgressing all rules of sobriety and taste, as is so frequently manifest. I have little to say about individual works in these two exhibitions; they spoke for themselves, and the judges were quite content to stand or fall by the justice of their awards. I am, doubtless, expected to say something specially on the art question. My remarks, however, must be very brief, and while expressing any satisfaction at some notable examples of artistic feeling in both exhibitions, as regards composition in line, and light, and shade, I recognise no advance, so to speak, all along the line; those who have the artistic feeling always show it, though some of the well-known names do not come up to the standards they set themselves in former years. The efforts of those who have not the artistic feeling, however laudable in some cases those efforts may be, they are sometimes none the less painful, and it was with considerable surprise to me that works of this class were so observable in Pall Mall.

It is not given to every, in other respects, excellent photographer, to be essentially artistic, and we ought to feel glad that there are obvious fields of occupation involving considerable interest and enjoyment in utilitarian and archæological directions for, I will not say the "weaker brethren," for they are strong in their several qualifications and gifts, and set a good example to the amateur, who may not have the art afflatus, by doing something useful, doing it well, and consequently benefiting the art of photography generally.

And now, before I conclude, I should like to say a word or two on the standpoint of criticism. I do not, myself, see the absolute necessity of judging every photograph that comes before one as one would judge a pictorial composition. There are, of course, those who set out to make pictorial compositions—these should, and must, be judged by the severest tests; but there are many excellent photographs in all exhibitions which, if I may so speak, are absolutely innocent of any such idea or intention, photographs which pretend to be no other

* It becomes a serious question for the members of the Photographic Society of Great Britain to consider whether, in case their present room is unsuitable for such arrangements as I venture to propose, in justice to themselves and their art, they should not seek another place for their annual exhibition.

than more or less faithful memoranda of places and things. Modern criticism, I fear, is rather prone to scoff at these things, and unadvisedly, for they have their value. I am not holding a brief now for the inartistic; I have no such idea. I think you know that from what I have said here and elsewhere, I love and revere the artistic as I scorn and despise pot-shotting or those who would tell me that a photograph of nature must of necessity be a work of art; but I do say this, that a simple photograph that makes no pretention to being a work of art, should be judged on its own unpretending merits and standpoint; if it cannot be a thing of beauty, it may at least be a thing of use. There are heaps and heaps of studies that are of special value in this direction, not at all to be included in that incongruous and vague, if art-affecting term, "bits," in its generally accepted sense, but bits of utility that the painstaking amateur may make exceedingly useful to the artist.

But back to the exhibitions for my last word, and it is to tell you what, perhaps, you already know, but that I, as one of the judges in Pall Mall last year, far from holding as a secret, think cannot be published too widely, viz., in our report on the exhibition to the Society a rider was appended. Proposed originally by myself, it had the honour of adoption in a very slightly modified form by my co-jurors, the general sense being to this effect, that we regretted to find it necessary to suggest to the hangers in future greater discretion in the exhibition of works, as we found many on the walls unworthy of a place in the Exhibition of the Photographic Society of Great Britain. I may now add that they were inferior works to many I saw last year in amateur competitions.

I am perfectly well aware that I am on delicate ground in the matters I am discussing, but I make no excuse for telling tales out of school, if any one pleases to call it such. "The chiel amang them" in Pall Mall is neither ashamed of taking notes nor of publishing them, and, indeed, considers himself more than justified by the important, nay, I may say national, considerations involved. A defence is quite likely to be set up, if any notice is taken of my remarks at all, that the exhibition was injured by the withdrawal of certain works after they were hung. But whose fault was that? Not that of the public, surely, who are, or should be, the chief consideration. While I freely admit that the exhibitor who withdrew those works on his section would well have afforded to have allowed them to remain, though ineligible for competition from infringement of established rules; yet the works had no business to have been hung at all, if they had transgressed those rules, but, being hung, nothing could justify their being taken down after being exposed for hours to the consideration of the judges, and withdrawn, so to speak, from under their very noses, almost at the moment of making their awards.

I am aware that in making this statement I am in direct conflict with the impression conveyed by the assistant secretary as reported in the public prints; nevertheless, what I say is perfectly accurate and literally true, while the impression conveyed by the assistant secretary is entirely misleading, for though we, the judges, did not make out our report, of course, until the evening was well advanced, having to inspect the exhibition of lantern slides, yet we had registered many awards at the time Mr. Davison's works were withdrawn. We had had several hours to look at them singly and at our leisure; moreover, as I have stated, we were absolutely approaching these photographs in the afternoon in a body, to decide upon them, when they were interdicted, much to the vexation of more than one of our number. I say nothing about scant courtesy to the judges; I say nothing about unfairness to the Exhibitor; he is strong enough in his own line to suffer little, and can take care of himself; but I say that such an awkward piece of bungling, while calling loudly for reform in management, throws a strong side light on this exhibition generally, which, however loudly proclaimed a financial success, cannot but be a regret in perhaps more important issues. I trust it will not be without its lesson to us, and that steps may be taken to avoid its repetition. This end and aim in view, you may be pleased to accept, as in some measure, an extenuation of my sins in the pains I have put you to by so long a strain on your kind attention. PHILIP H. NEWMAN.

WEST LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

For the least of the West London Society's claims upon our favourable estimate of the exhibition of its members' work, held on Friday and Saturday last, arises from the commendably small number of photographs shown on that occasion. These numbered a little more than a hundred, and if, as we conjecture, they are to be accepted as representative of the Society's collective photographic skill, we are happy to admit that there were few, if any, pictures upon the walls which the most scrupulous hanging committee would venture to exclude. In fine, the task of the Judges—Messrs. Valentine Blanchard, H. P. Robinson, and G. E. Cook—must have been as difficult as it was agreeable, so high was the average of the work on view.

A frame of small views—*Morning*, *Evening*, *Calm*, *Storm*—by Miss Maud Bilton and Mr. C. Bilton, struck us as being excellently rendered studies of meteorological effect; but, if they had been medalled, to whom would have belonged the award? Photographic partnerships are a novelty. Mr. W. L. Colls towered like a Triton among the minnows with his untouched portraits taken in an ordinary room, which, if not quite so hard in the lights, would have been flawless; but they deserved their medal. Mr. J. A. Hodges, with *Softly Falls the Evening Light*, *Twilight* (medal), *The Wane of Day*, *The Icebound River*, *A Haven of Rest*, and *A Riverside Idyll*, carried off the palm for perhaps the most artistically chosen and executed series on the walls. *Blowing up for Rain*, by Mr. Lambley, a judiciously exposed and printed study of a brewing storm, deserved the medal which was given to *A Dredger, Kew*, by Mr. W. S. Rogers, a mappy study of craft on the Thames, possessing little more than technical merit. Several of Mr. Rogers' other pictures, in cool toned bromide, were killed by the unsuitable grey mounts employed.

Mr. H. Selby betrayed unquestionable technical skill in *A Welsh Valley* and *Low Tide*; but, in our judgment, his brother, Mr. L. Selby, was lucky in securing a medal for so commonplace a view as *Far from the City's Strife*, a *fin-de-siècle* young man lounging in a leafy lane, the picture having a red tone. The same gentleman showed a view of *Windsor Castle*, in which that edifice, compared with the foreground, had a most exaggerated spectral appearance. Clearly the printing was here at fault. Mr. Charles Whiting's large, boldly handled marine studies, *Early Morning*, and *Waiting for the Tide*, more than earned their award.

With scarcely any exception, the exhibition was one of which the West London Society may feel proud. We congratulate the members on the comparatively small number of portraits hung. In photography—particularly amateur photography—this is one of the things best left undone by all but a gifted few. We look forward to the next exhibition of the Society with considerable interest, as it is seldom that in so young a body we have reason to be so pleased with the quality of the work shown.

Our Editorial Table.

Mr. Charles Reid's Animal Studies.

Messrs. G. W. Wilson & Co., of Aberdeen, have sent us some examples of this well-known master's work. They are 12×10 carbon prints of *At the Smithy* and *Donkey and Cart*—two of a numerous series of Mr. Reid's pictures. We shall prize these charming productions, which, both in selection and treatment, are eminently worthy of one who has long and successfully made animal photography difficult of dissociation from his name and reputation.

The Photographic Quarterly.

London: Hazell, Watson, & Viney.

The January number opens with an article on Photo-micrography, by J. G. P. Vereker, illustrated with reproductions by the author. In a capital paper on "Impossible Photography," by H. P. Robinson, the author analyses certain American photographs illustrative of Tennyson's *Elaine*, and shows their untruth to nature at the time Elaine is supposed to have lived. There are other papers, notably one by Dr. P. H. Emerson, in which he denies that photography is art.

Hurter & Driffield's Actinograph.

Messrs. Marion & Co., Soho-square, have sent us one of these instruments, which we have not yet had an opportunity of trying. In mechanical construction it is very neat, the scales and curves being beautifully distinct. It is of a size to be easily carried in the pocket. Messrs. Marion say:—

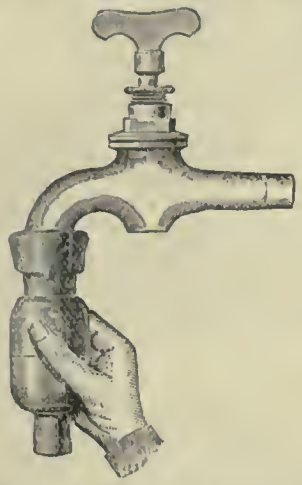
"It is a most reliable instrument, and worked in conjunction with our plates, of which the speed has been determined by Hurter & Driffield's method, we should say failures from incorrect exposures will become a thing of the past. From our trials, both of Hurter & Driffield's method of determining the speed of dry plates by measuring their densities, and of the actinograph itself, we found the results invariably correct. We have, therefore, determined to mark all our boxes of plates with the speed number. Each batch of plates will be carefully tested for speed, and the actual result given, so that users of plates may perfectly rely on the correctness of the figures, and expose accordingly; also the

speed numbers given are relative to each other. Thus, if a packet of ordinary plates are numbered respectively 17 and 20, the latter would be $\frac{3}{20}$ more rapid than the 17. Besides determining the speed of the plates, Messrs. Hurter & Driffield's method serves for giving correct time for printing positives, also correct time for making of paper bromide enlargements. For these matters we are preparing a circular giving directions."

We shall embrace an early opportunity of trying this actinograph. A pamphlet giving full directions for use, accompanies the instrument.

The Filter for the Million.

Mr. William Tylor, Birmingham, sends us a specimen of a new filter he has just brought out. It is shown, pressed up against a tap,



in the annexed cut. Although sold at a very low price, it acts most effectively, and removes all mechanical impurities from the water.

Detective or Snap-shot Album.

Messrs. Percy Lund & Co., Bradford, have issued an album suitable for the above-mentioned class of photographs. It is plain, substantial, and devoid of that showy, imitation-gold look which characterises so many of the cheap German class. The mounting boards are stated to be pure, hence there is no fear of the prints becoming deteriorated from sulphur, chlorine, or other deleterious agent.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 139.—"Improvements in Optical Instruments or Apparatus for use in Viewing Pictures and other objects." W. E. Williams *Dated January* 4, 1892.

No. 154.—"Improvements in Appliance for Saturating Air, Oxygen, or other Gases with the Vapours of Ether or other Volatile Fluids." Complete specification. A. T. Danks.—*Dated January* 4, 1892.

No. 228.—"Improvements in Frames for Photographs, Pictures, and the like." J. P. King and H. W. King.—*Dated January* 5, 1892.

No. 307.—"Improvements in Photographic Cameras." J. Zenk.—*Dated January* 6, 1892.

No. 356.—"Improvements relating to the Production of Artificial Light for Photographic purposes and to Apparatus therefor." W. Willis, E. J. Humphrey, and W. H. Smith.—*Dated January* 7, 1892.

No. 388.—"Improvements in Photographic Cameras." Complete specification. W. Langenbruch.—*Dated January* 8, 1892.

No. 391.—"Dark Slide and Changing Box, and Carrier and Bag." E. Sledge.—*Dated January* 8, 1892.

No. 398.—"Improvements in Racks for Displaying Christmas Cards, Photographs, and the like." E. Crowe and L. Wycherleystone.—*Dated January* 8, 1892.

APPLICATION FOR AMENDMENT.

No. 13,879. 13th October, 1887. "Improvements in or connected with Photographic Cameras."

Edward Valentine Swinden and Joseph Earp have applied for leave to amend the Specification of the Letters Patent above referred to, alleging as their reasons:—"That we are advised that certain parts of the Specification set forth and claimed certain features the novelty of which was doubtful at the date of the patent."

The proposed amendments are as follows:—

On page 5.

Line 11. Altering to read: "We provide the back of the plates of the kind herein."

On page 6.

Line 46. To substitute "glass" for "brass."
Line 53. To substitute "photographic" for "photograph."
Line 56. To insert "upright or substantially upright" before "position."

On page 7.

Line 2. Altering to read, "and causing them to fall or become placed in a horizontal or substantially horizontal position."
Line 11. To insert "in an upright or substantially upright position" after "media."
Line 13. Altering to read, "said chamber, a second chamber disposed below the level of the primary chamber, and adapted to receive and hold said plates in a horizontal or substantially horizontal position as they are passed."
Line 16. To substitute "the" for "a" after "Z."
Line 19. To insert "in front of the primary chamber and" after "chamber."
To strike out lines 30 to 44 inclusive.

SPECIFICATION PUBLISHED.

1890.

No. 20,299.—"Photographic Sheaths." Newman and Adams.—Price 8*d*.

PATENTS COMPLETED.

New or Improved Paper for Making Transfer Pictures from Photographs.

(A communication by the firm of Zahn & Schwarz, of 6, Neue Ross-strasse, Berlin, in the Empire of Germany.)

No. 18,219. William Phillips Thompson, F.C.C., M.I.M.E., 6, Lord-street, Liverpool, and 6, Bank-street, Manchester, Lancashire; and 323, High Holborn, Middlesex.—*November* 28, 1891.

It is well known that transfer pictures are made by taking the impressions in question on the prepared side of a piece of paper which is coated with a layer of some substance soluble in water (starch, dextrine, and the like) and when the pictures are coloured with the colours in reversed order.

The colours adhere in fact not to the paper, but to the film, which is soluble in water.

If such a transfer picture be pressed with its imprinted face on the article to be decorated, and moistened on the back, the soluble coating dissolves off, the paper may be drawn off, and the picture then adheres to the article to be decorated.

As the colours of such transfer pictures often become so dry that they no longer adhere, in such cases it is of benefit to give the article to be decorated a thin coat of varnish or lacquer, which firmly retains the colour.

Paper prepared in a suitable manner may be employed for almost all possible kinds of impressions with hitherto almost the sole exception of photographs.

The film of gelatine which in this kind of print forms the printing negative must, during the printing, be kept thoroughly moistened, and is at the same time very adhesive. This latter quality is also further possessed, to a large extent, by those substances which are employed for the preparation of transfer pictures as soon as they become moist, apart from the fact that they then also easily lose their coherency.

If such paper be then laid on a rolled-up photographic negative film in order to be printed, the moisture of the layer which covers the paper is communicated thereto in consequence of the pressure exerted by the pressing frame, it becomes damp, sticky, and ceases to adhere. The great stickiness of the gelatine does the rest. Both the layers of the gelatine impression film and the transfer paper stick together, and on the drawing off the paper one or the other is so damaged that it is impossible to produce transfer pictures by means of photography in this manner.

A process for producing transfer pictures by photographic means must, however, be of very great industrial importance in view of the beauty of photographs, as these latter reproduce the originals, with all their half-tones, after almost merely mechanical preparation.

By this invention the drawback which hitherto rendered impossible the production of transfer pictures from photographs is obviated by the insertion of a layer of grease between the soluble coating of the transfer paper and the gelatine film of the original negative. This layer of grease allows the colour of the original to penetrate to the prepared transfer paper, but permits the transfer paper to be drawn off without either being injured itself or injuring the original photograph. The transfer picture obtained in this manner can be used in the usual way for transfer on to other articles.

The paper is for this purpose, after having been coated in the usual manner with a thin layer of a substance soluble in water, further prepared by placing over the layer of the soluble substance, as thin as possible, a coating which consists of fat, oil, or resin, or a mixture of these substances. The picture is imprinted on this layer of fat, the colours being very well taken up thereby. As the damp gelatine film adheres neither to the layer of grease nor to the paper, and the layer of grease also prevents the moisture of the gelatine from penetrating to the soluble substance, in this manner very complete prints are easily obtained.

The application of the layer of grease is performed, either by coating the already prepared paper according to the hardness and the kind of fat, oil, or resin, or the mixture of these latter; or, in case the substances employed have a solid condition as a whole, by rubbing it with a powder composed of these substances, or by dissolving the substance of which the layer is to consist in alcohol, ether, benzine, or any similar easily evaporated substance, and coating the prepared paper with such solution.

The paper is very valuable from the fact that it is possible to print on it direct from the photographic negative with soluble colours, which, when rubbed with varnish, become printing colours.

In this manner pictures are obtained which reproduce the tones and tints of the original far sharper and finer than the so-called stencilled pictures.

Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, as communicated to me by my foreign correspondents, I declare that what I claim is :—A paper which is rendered suitable for the production of transfer pictures from photographic negatives by having a layer of grease in addition to its first preparation with a layer of a substance soluble in water.

A Portable Magazine Camera for Taking Photographs.

No. 1933. Charles Richard Beaumont, 2, Whitehall-street, Rochdale, Lancashire.—*December* 5, 1891.

This camera is of rectangular shape, and is divided into two compartments, an upper and a lower one. The upper chamber or compartment is for the purpose of storing the prepared plates, both before and after exposure. The lower chamber or compartment is for the purpose of exposing the plates to the light acting through the lens while taking the photograph. The upper chamber is fitted with a grooved plate-carrier for containing any convenient number of plates. This grooved plate-carrier is constructed to slide or travel within the chamber, over a slit cut in the division, between the two compartments. Motion is imparted to the travelling plate-holder preferably by means of a rack and pinion.

A screw or ratchet motion may also be used for this purpose.

Fitted on each of the exposure chamber, opposite the slit in the division, are grooves for the purpose of sliding the plates from the carrier to the place of exposure, and *vice versâ*. The plates are brought into opposition successively with the slit in the division of chambers by means of a milled nut on the outside right hand of camera. An indexed wheel, visible on the outside of camera, and engaging in the rack pinion, serves to indicate the number of plate or plates exposed. The grooves in which the plates slide to and from the storage to the exposure chambers are fitted with a bar of brass, or other suitable metal, for the purpose of lowering or raising the plates to and from the exposure chamber. The ends of said bar are fitted so as to slide freely in grooves, the plates resting on the bar while being lowered from, or raised to, the storage chamber. This sliding bar is actuated by means of two steel arms, the ends of which are made to fit loosely in holes at each end of bar.

These arms are attached to an axle, fitted across the back central portion of exposure chamber. The said axle projects through the right-hand side of camera, and is revolved by a small lever handle, having a catch for retaining the bar at its highest position after each plate has been returned to the carrier. The slit through which the plates pass in division of chambers is closed so as to exclude light from the plates by means of a metal plate sliding within the exposure chamber.

This metal plate is actuated by means of a rod attached, which projects through the back of camera and terminates in a milled button. On the said metal plate are fitted side supports for carrying the focussing screen.

The frame of focussing screen has slots—two on each side—about quarter of an inch long, by which the screen is mounted on pins screwed into the side supports. These slots allow the focussing screen to move backward and forward in a horizontal position on the pins.

The focussing screen is held in proper position, and focal register, by means of springs, one on each side, attached to the metal plate. The sensitive-plate chamber is fitted with a sliding lid for the purpose of putting in and taking out the plates. On this lid is placed an arm, of suitable length, made from steel or other metal.

The said arm is mounted at right-angles on an axle, and moves in an arc line towards slit in division of chambers, and when at rest is directly over and in a line with the sensitive plate resting on the moving bar. The said axle terminates at the rear of camera in a small key handle, and is for the purpose of pushing the plates out of the plate-carrier into the exposure chamber, when the camera is being used on its side. The end of arm which presses against edge of plate is made of letter U-shape, and is fitted with a small roller for minimising friction. The arm is also fitted with a spring for returning it to its original position after being used.

Improvements in and in connexion with Photographic Apparatus.

No. 13502. Erwin Hacker, 31, Königstrasse, Stuttgart, Wurtemberg, Germany.—*December* 5, 1891.

My invention relates to a means for photographing in bound light.

Under the expression bound light, such source of light is implied as is entirely under the control of the photographer, that is, which may be increased, decreased, and regulated to requirement.

I not only employ direct light—i.e., that light, the rays of which meet the object directly—but also reflected light. The object of photographing in bound light is to enable reproduction in full or life size, and to distribute the light in such manner as to render the reproduction equally sharply defined all over, and to obviate a blurring of the same owing to the variation of the rays caused by the height of the object to be photographed. Photographing on this system is carried out, according to my present invention, by enclosing the object to be reproduced within a revolvable housing closed on all sides, and formed of a combination of surfaces arranged at various angles to each other, such housing gradually converging to a funnel for the reception of the source of light.

The surfaces are advantageously fitted together in such manner as to allow the angles at which they stand in regard to each other to be varied, so that the object to be photographed can be illuminated in various ways, according to requirement. The closed housing is revolubly mounted a pivot, above which the object or person to be taken is situated, so that the latter may be illuminated in various ways, and thus various light and shade effects attained. The housing may be revolved a distance covering about 270°.

In order to employ this bound light, which enables an absolutely intensive illumination of the object in question, a particular arrangement of the camera is necessary in order to prevent mirage and false reflections. For this purpose the direct traversal by the rays passing from the object to the lens, and by the reflected rays passing to the sensitive plate, must be closed on all sides—that is to say, the camera must be closed light-tight on to the housing for the reception of the object to be reproduced.

The lens is arranged inside the closed camera casing, and the latter is provided with shades arranged at intervals in order to prevent mirage and false reflections, and to strictly confine the light to the effective cone of rays.

The closure of the camera on to the housing, after the latter has been adjusted in a position according to the light required, is effected in such manner that the axis of the camera, the centre of the object and the background, if such is present, lie in one line.

[A description of certain diagrams follows, after which come the following claims.]

1. The process of photographing in bound light, to enable the perfect control and regulation of the light effects, consisting in confining the object to be reproduced in an entirely closed room or housing, having its walls angularly and adjustably arranged together and in relation to each other, said housing adapted to be light-tightly closed on to the camera, and provided also with means for the reception of the artificial source of light, substantially as described. 2. For photographing in bound light, a housing or room consisting of trapezium-shaped surfaces, formed of fabric, on frames adjustably arranged at angles to each other, said housing having adjustable light funnel, platform, and stool, and being provided with suitable means for attaching the camera, as also for the arrangement of a background, substantially as described. 3. In combination with the housing of the form described and having platform, light funnel, and background, the camera having adjustable front casing for the focus and sensitive plate, and middle casing with partitions, and lens mounted in support, said partitions being perforated as described to confine the light to the effective cone of rays from the object, said camera having further folding chamber at its rear end for the purpose, substantially as described and shown. 4. The process and device for photographing in bound light, substantially as hereinbefore described and illustrated in the accompanying drawings.

Improvements in Photographic Cameras.

No. 2279. Tom Miller, Broughton-road, Salford, Lancashire.—*December* 2, 1891.

My invention relates to improvements in photographic cameras of the class that are employed for stereoscopic purposes, or taking two precisely similar pictures at the same time.

The objects of this invention are first to place a greater or less number of sensitised plates in a photographic camera of the above description in rapid succession for the purpose of exposure, and to remove said plates successively after exposure without requiring to be touched or handled by the operator, or taken out of the camera until necessary for the development of the picture ; and, second, for obtaining either instantaneous or prolonged exposure.

In photographic cameras that are used for taking stereoscopic pictures it is necessary to employ two lenses, which are attached side by side at, or near, the front of said camera at a suitable distance apart, and to place within the camera a longitudinal division. This division has hitherto been securely attached to the camera, or has been attached in such a manner that if required to be placed out of the way it has had to be removed by the operator. In this invention I form a photographic camera for the purposes hereinbefore set forth, preferably of a rectangular shape. In the back of said camera I construct two chambers, an upper and a lower one. The upper chamber is for the purpose of retaining any number of sensitised plates in position, so that they may be used successively for taking pictures, and the lower chamber is for the purpose of receiving said plates after the picture has been taken without requiring the plates or plate to be removed from the camera.

In the floor of the upper chamber I form an opening, through which the plate, on which an object or a view has been taken, slides into the lower chamber, and allows the next plate to be exposed ; the front portion of the floor of upper chamber is placed at an angle, to facilitate the discharge of the plate into the lower chamber through the aperture in floor.

In order to place the plates in position for taking a picture, and to remove them out of the way when a picture has been taken, I employ a double cam or worm, the rounded edge of the back part of which has been flattened vertically, and the rounded edge of the front portion has also been flattened, but horizontally. When the plates are put in this upper chamber, the bottom front edge of the first plates comes in contact with a small ledge or register on the edge of the opening in floor, and the upper part of said plate rests against the back of aforesaid double cam or worm ; this cam or worm is attached to a spindle passing to the outside at end of camera. I attach a handle or a wheel to this spindle, by which to operate said cam. When a quarter of a turn is given to the cam or worm by means of aforesaid handle, the flat vertical side at back of camera assumes a horizontal position level with the top of the front plate, thus allowing the upper edge of the front plate to enter the groove of the cam or worm, and rest against the front part of said cam, the flat side of which having, by the before-mentioned operation, been placed in a vertical position.

When a quarter-turn back is given to the worm the flat sides are again placed in the positions they originally occupied, thus permitting the front plate to fall forward after exposure on to the inclined front portion of floor, and slide through the aperture into the receiving chamber underneath, while at the same time the plate next in succession is pressed forward into position for taking a picture by means of a spring inside the back of case, until it, in its turn, is caused to fall forward and slide into the receiving chamber by the action of aforesaid double cam or worm.

For the purpose of removing the longitudinal division that is affixed within the camera, between the lenses, out of the way each time that the plate upon which a picture or an object has been taken, in order to allow said plate to fall forward on to the inclined portion of floor of upper chamber, and slide through aperture into receiving chamber, I attach the aforesaid longitudinal division to a rod which is supported by brackets secured to the inside of roof of camera.

I connect one end of this rod to the front part of aforesaid double cam or worm by means of a he and she joint in such a manner that when said double cam is revolved, as hereinbefore described, for the purpose of removing a plate, said longitudinal division is also turned up against the inside of roof of camera,

but at a period slightly in advance of the time of the plate falling forward, so as to avoid contact with said plate.

By these means said longitudinal divisions will always be in a vertical position at the required time, but will be out of the way each time a plate is removed. The hereinbefore described he and she joint need not be employed if it is not intended to construct the camera with the back portion separate from the front, as said rod by which the longitudinal division is supported may be a continuation, and form a part of the rod or shaft that carries the double cam or worm.

For the purpose of obtaining either instantaneous or prolonged exposure by simultaneous admission of light through both lenses I form a V-shaped shutter, each of the upper ends of which are sufficiently large to cover aperture in front board. I attach said shutter to front part of camera by means of a pin passing through the lower part of shutter in order that it may pivot thereon. I form the lower or narrow end of shutter with a projection, and in proximity thereto I place a spring wire rod. In order to operate the shutter this rod is pulled down over aforesaid projection without altering position of shutter, but when the wire is allowed to return said wire comes in contact with the projection on bottom of shutter, and thus causes the shutter to open, when aforesaid wire passes over the projection and the shutter again closes.

The claims are:—1. In a magazine or hand photographic camera, in which two lenses are employed for stereoscopic purposes, or for taking duplicate pictures at the same time, the use of a longitudinal division affixed to a spindle, and supported so as to be removed by the operator out of the way of a plate, on which a picture or an object has been taken and replaced in position, without internal hand manipulation, in the manner and for the purpose substantially as hereinbefore described. 2. In a magazine or hand photographic camera, in which two lenses are employed for stereoscopic purposes, or for taking duplicate pictures at the same time, the use of a longitudinal division in combination with a double cam or worm, said division being supported and arranged so as to be removed out of the way of a plate, on which a picture or an object has been taken, immediately prior to said plate being released by the action of the double cam or worm, both the removal of the division and the release of the plate being performed at one operation, and without internal hand manipulation, in the manner and for the purpose substantially as hereinbefore described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
January 18	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 18	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
,, 18	Hastings and St. Leonards	
,, 18	Leeds (Technical)	Mechanics' Institute, Leeds.
,, 18	South London	Hanover Hall, Hanover-park, S.E.
,, 19	Exeter	College Hall, South-street, Exeter.
,, 19	Keighley and District	Mechanics' Institute, North-street.
,, 19	North London	Wellington Hall, Islington, N.
,, 19	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 19	Southport	Shaftesbury-buildings, Eastbank-st.
,, 20	Brechin	14, St. Mary-street, Brechin.
,, 20	Bury	Temperance Hall, Bury.
,, 20	Hyde	
,, 20	Manchester Camera Club	Victoria Hotel, Manchester.
,, 20	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 20	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 20	Southsea	
,, 20	West Surrey	St. Mark's Schools, Battersea-rise.
,, 21	Birmingham	Lecture Room, Midland Institute.
,, 21	Camera Club	Charing-cross-road, W.C.
,, 21	Greenock	Museum Com. Room, Kelly-street.
,, 1	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 21	Oldham	The Lycenm, Union-st., Oldham.
,, 22	Cardiff	
,, 22	Holborn	
,, 22	Maidstone	"The Palace," Maidstone.
,, 22	Richmond	Greyhound Hotel, Richmond.
,, 22	West London	Lec. Hall, Broadway, Hammersmith

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

JANUARY 12,—Mr. J. Spiller, F.C.S., in the chair.

Messrs. Scamell and Mackie were elected Auditors, and Messrs. C. Sawyer, J. D. England, E. W. Parfitt, E. Clifton, G. L. Addenbrooke, J. R. Gotz, and T. Samuels, Scrutineers for the ensuing annual meeting.

As it was necessary, in accordance with the terms of the affiliation scheme, that delegates from the Society should be appointed to act with the delegates of the affiliated Societies, Messrs. G. L. Addenbrooke, W. Bedford, and L. Warnerke were elected to act in that capacity on behalf of the Society.

The CHAIRMAN reminded members that the anniversary meeting of the Society would be held on February 9, and said that Mr. William England had undertaken to organize a dinner for the previous evening, Monday, February 8. Moreover, as Mr. Glaisher had definitely made it understood that he would not again be put in nomination as President, this would be the occasion of his retirement. He had been asked to be present at the dinner, and had consented, and he would then be officially present for the last time.

Mr. W. ENGLAND said, as this would be the last time when the President would take the chair, he hoped he would have a most hearty reception, and be well supported by the members.

The CHAIRMAN announced that January 19 was the last date for receiving nomination papers for the Annual Meeting.

Mr. T. R. DALLMEYER read a paper on *Reflections and Refractions*. Premising that he had brought the subject of reflections from the concave surfaces of lenses before the Society on a former occasion, he said that these investigations had suggested to him the possibility of constructing a lens, the back of which should be silvered, the focus of the lens itself being such as to overcome the spherical aberration of the reflecting surface. The form of lens which he had ascertained best adapted for this was a concavo-convex, or negative meniscus lens, the convex surface of which was silvered. So perfect was the correction that could be obtained in this way, that while a small telescope, that he exhibited, had an angular aperture of 2:1, he expected that ultimately he would be able to have it as 1:1.

Mr. J. TRAILL TAYLOR said he could see immense possibilities in the application of the system to the lantern. He was a stickler for intense illumination, and thought Mr. Dallmeyer had entirely hit the right nail on the head. While Mr. Dallmeyer was reading the paper, he (Mr. Taylor) was trying mentally how to get the whole volume of light in use without the interference of the poles of the arc lamp. The effect of the latter could be got rid of in the way Mr. Dallmeyer had told them. He thought Mr. Dallmeyer had shown him the same kind of mirror on a previous occasion. It had the largest aperture, without exception, he (Mr. Taylor) had ever seen, or of which he had conceived the possibility. It was a lens of three or four inches diameter, but he did not know its construction. It was impossible to pick up a lens brightly silvered on one side and note its construction. It was the very thing for searching for comets in the daytime. Applied to the telescope, it would form a "night glass" for seeing, on account of its enormous aperture, objects scarcely possible to be seen by any achromatic telescope.

Captain ABNEY had had some little experience with silvered mirrors in spectroscopic work. In photographing the ultra red rays, a quantity of light was a desideratum, as the exposure was so long. His form of collimator was originally a silvered mirror, but he had found it tarnish so much that he had had the back of a lens silvered. There was a certain amount of spherical aberration, but he got a large beam of light, which gave satisfactory results. As to the means of getting rid of spherical aberration, Mr. Dallmeyer apparently did it completely. As to the application to the optical lantern, it had been done in the physical laboratory at South Kensington. They got bright images, but nothing like those possible here. He had had a good experience of the electric light, and had tried a mirror at the back, but the drawback was the interference of the poles. It seemed to be impossible to get a clean image on the screen. By revolving the apparatus they might get rid of the shadow. It would have to be rotated about twenty times a second. It was sometimes a useful way of getting rid of defects to rotate an image, if the thing itself could not be rotated. Professor C. V. Boys had gone a great deal into the use of silvered mirrors, by which he was able to deduce radius of curvature.

Mr. TAYLOR asked if there was a reasonable probability of the application of the system to photographic purposes. In the Daguerreotype days Beard had a patent for taking images by reflection instead of by a lens. There were circumstances under which it might be desirable to take small photographs in an imperfectly lighted room, and he could see the possibility of this system being exceedingly useful.

Mr. DALLMEYER observed that, in using a combination instead of a single lens, every drawback could be overcome.

Mr. CHAPMAN JONES questioned the use of a mirror for taking photographs with very rapid plates. With slow plates the light diffused inside the apparatus might not matter, but with very rapid plates it might have a disastrous effect.

Captain ABNEY said he used very rapid plates indeed for spectroscopic work, and found no difficulty. If the mirror was bright, light could be excluded without fogging the plate. No light came in except that which formed the image. Light could be excluded, but the mirror must be bright.

Mr. JONES said Captain Abney referred to a beam of light. There was a difference between this and the general light of an ordinary object.

Mr. TAYLOR drew a diagram of the apparatus to which he referred, and pointed out, from the position of the plate and the reflector, that there was no fear of daylight getting to the plate.

Mr. JONES also sketched the apparatus of which he spoke. It was of different construction, and admitted light all round.

Captain ABNEY said the system Mr. Taylor sketched was the one he adopted.

A vote of thanks was passed to Mr. Dallmeyer for his paper.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 7.—Mr. P. Everitt in the chair.—There was a large attendance.

Mr. J. HAY TAYLOR exhibited Staniforth's jet-holder for raising and lowering the lantern jet, and also Archer's dissolver, upon which he had himself made some improvements, and to which a modification of Wrench's rising stage was fitted.

The CHAIRMAN showed one of Messrs. Hurter & Driffield's actinographs recently brought out by Messrs. Marion & Co., and said he thought the action of the latter firm in issuing this actinograph, and marking their boxes of plates with the inertia number, was one of the most important steps taken in recent years in the direction of assisting photographers in obtaining correct exposures. Messrs. Hurter & Driffield had determined the light curves of the various hours of the day, and gave a scale of them, together with the diameter of the stop in proportion to the focal length of the lens; also another scale which gives the speed numbers of the various intensities of light. Another series of numbers are given for various classes of subject. The Chairman then explained the working of the instrument.

Mr. W. E. Debenham produced two faded transparencies handed to him the previous week by Mr. J. Traill Taylor to try the effect of Schlippe's salts upon them. One of the transparencies had been brought to such a degree of intensity that another negative and transparency could be made from it. The other image had hardly been improved; so probably there was hypo in the picture.

Mr. P. H. NEWMAN then read a paper on *Some Recent Exhibitions* [see page 39].

The CHAIRMAN hoped the paper they had just heard would lead to some improvement in the conduct of exhibitions, whether at Pall Mall or elsewhere. Their Association had no status with regard to the Exhibition, but they had

recently been affiliated to the Society, and therefore it was a question whether their opinion of the Society should be made known. One point with reference to the Pall Mall Exhibition struck him, and this was, upon what principle were the various medals awarded—for what class, for what purpose, and for what [illegible] Upon what considerations were the Judges guided in the various classes of work? Everything in connexion with the Society was in such a vague state that they ought to get some definite idea with regard to its proceedings.

Mr. DEBENHAM reviewed all the circumstances of the Davison incident, and defended the action of the Hon. Secretary of the Photographic Society of Great Britain.

Mr. T. BOLAS sympathised with Mr. Newman's aspiration that there might be a better condition of things at future exhibitions. That better condition of things seemed to him (Mr. Newman) in having no definite time for sending in pictures. In any exhibition where medals are awarded there should be a limit of time, and no picture should be received after the recognised time.

Mr. F. A. BRIDGE thought late pictures should not be shown at all, either not for competition or otherwise.

Mr. DEBENHAM was of opinion that, if an exhibition could be improved by showing pictures as not for competition, there was no particular objection to such a course.

Mr. BECKETT questioned the utility of discussion on this point.

Mr. DEBENHAM pointed out that Mr. Newman had raised the point in his paper.

Mr. BOLAS observed that the London and Provincial Association was affiliated to the Society, and therefore some expression of approval of that body's action would not be out of place. He thought a formal resolution could be submitted to the members.

The CHAIRMAN, having ruled that such a resolution would be inadmissible before the end of the discussion, went on to inquire to what extent retouching might be allowed.

Mr. J. S. TSAPE thought there was another phase of the question. If a damp sponge were passed over a great many exhibited photographs, they would present a different appearance. He would like to ask Mr. Newman whether it would be considered legitimate, when an artist could see where his picture could be improved by careful hand work, the same applied to photographs.

Mr. NEWMAN, in the course of his reply, said, with reference to Mr. Tsape's and the Chairman's questions, that he himself had come there for information on those points. He wished to know whether Judges should not be supplied with unretouched prints. He disclaimed any personal feeling in regard to the late [illegible] but sincerely thought the Assistant Secretary quite correct in his [illegible] as to Mr. Davison's pictures. The suggestions he had made for the benefit of future exhibitions would save the Judges a world of trouble.

On the motion of the CHAIRMAN, seconded by Mr. F. A. BRIDGE, a hearty vote of thanks was passed to Mr. Newman for his address.

Mr. THOMAS BEDDING then brought forward the following resolution, which, he said, from his knowledge of the [illegible] he had great pleasure in moving:—"That as the action of the officials of the Photographic Society of Great Britain in connexion with the recent Exhibition has been brought before this Society, the members of the London and Provincial Association now [illegible] to express approval of their action, and believe that the conduct of future exhibitions will be beneficially influenced thereby."

This was seconded by Mr. C. H. CREAR, and, on being put, was carried [illegible]. The meeting then adjourned.

Camera Club.—January 7.—A lecture, illustrated by lantern slides, was delivered by the Rev. A. R. W. WHARTON, M.A., upon the subject of *The Ammergau Passion Play*. Mr. W. Clarke occupied the chair. The striking characteristics of the villagers and the play at Oberammergau were well brought out by the lecturer in an able address, as well as by the [illegible] which were shown. Some discussion followed the lecture, in which Messrs. J. S. Wharton, J. Pennell, and the Chairman took part. On January 21 Mr. A. Maskell will read a paper on *Photography and Artistic Merit*. The subject will be illustrated. Meeting at eight p.m.

Holborn Camera Club.—January 6, Mr. D. R. Lowe (Vice-President) in the chair. Mr. HERBERT THOMPSON gave a lecture on *Kallitypy*, No. 2. The paper usually recommended platinotypes, and the exposure was judged in the same manner, the printing being continued until the detail in the highest lights showed [illegible]. The sensitiveness of kallitype paper was considerably greater than either, and the paper must be examined in a very weak light. Clouds could be printed in by double printing, in the same manner as printing on silver paper. The paper was developed in the following bath, for black tones—[illegible]; water, 10 ounces. Mix and add [illegible]. Any unexposed paper, after soaking, might be left in the bottom of the bottle. To the above solution twelve to fifteen grains of a mixture of [illegible] were added. Prints developed in [illegible] salt alone were not of a pleasing tone. The addition of borax gave greater transparency to the shadows, and produced a black tone. A smaller quantity of borax produced prints of a purple tint. The bichromate of potash was an accelerator, and its effect was to give contrast. A great amount of control was given by this substance. By using less than the normal quantity, soft prints might be obtained from hard negatives, and by increasing the quantity flat or [illegible] negatives might be made to yield brilliant prints. A very small quantity makes a considerable difference, and great care must be exercised in adding it, for too much would be added, and the effect would be a muddy and [illegible] print. The print should be left in the developer for about twenty or thirty minutes, so that the conversion of the iron salts into a metallic form might be complete. The prints would appear to be developed in a much shorter time, but if removed too soon the iron would not be removed in the [illegible] bath, with the result that the prints would be liable to fade, and [illegible] means would appear to some after-stage of the process. After development place the prints directly into the fixing bath (four drachms of [illegible] to the quart of water). The prints should be freely moved in the fixing bath for about ten minutes, and then passed through a second bath of the same strength, to ensure perfect fixation. After fixing, the prints were washed for about ten minutes in several changes of water, then placed on a sheet of glass to drain, blotted off between clean blotters or cloths kept specially for the purpose—free from acid or hypo—and spread about to dry in the air. If left in a wet condition between the cloths, stains are liable to appear. Some excellent prints, kindly lent by the Birmingham Photographic Company, were passed round.

North Middlesex Photographic Society.—January 11, Annual General Meeting, the President (Mr. J. W. Marchant), in the chair.—Five new members were elected. The balance-sheet showed the funds of the Society to be in a satisfactory condition, notwithstanding the heavy demands made upon them to carry out the numerous improvements projected during the year. The President then read his report of the year's work, showing a large increase in the membership and increased activity in all branches of work by the members, giving thanks to Messrs. Gale and Robinson, the Judges at the Exhibition, and to those gentlemen, non-members and members, who had assisted the Society with lectures and demonstrations during the year. The report was unanimously adopted. Votes of thanks were accorded to the retiring officers and Council. Several alterations in the rules were made, and the following officers and Council were elected:—*President:* Mr. G. W. Marchant.—*Vice-Presidents:* Messrs. H. Walker and F. L. Pither.—*Council:* Messrs. F. Cherry, C. C. Gill, J. C. S. Mummery, H. Smith, T. C. Lathbridge, C. Beadle, J. L. Treadway, J. Stewart, J. Saville, S. E. Wall, W. Taylor, and C. O. Gregory.—*Treasurer:* Mr. F. W. Cox.—*Hon. Secretary:* Mr. J. McIntosh, 14, Lowman-road, Holloway.—*Assistant Hon. Secretary:* Mr. F. M. Ainsley. Tickets for the Photographic Society of Great Britain lectures were distributed among the members, and it was resolved that the Society should, as a body, support the testimonial to Dr. R. L. Maddox. The next meeting, which will be held on Monday, January 25, will be an exhibition of members' lantern slides.

South London Photographic Society.—January 4, Instruction of Beginners by Mr. F. W. WEBB.—The lecturer, after explaining the various movements of the camera and their uses, dealt with exposure and the methods of developing negatives, producing a considerable number of the latter to illustrate the pitfalls of beginners, at the same time giving good advice as to how these were to be avoided. Mr. Webb also produced a spectrum screen which he had made, together with photographs of the same on ordinary and Ilford isochromatic plates, which led to a long discussion as to the uses of colour correct plates, prints from Edwards' isochromatic plates, and Gotz's Obernetter films, with the negatives, being referred to the course of the discussion. By the courtesy of Messrs. Greeff & Co., samples of the rodinal developer, and of para-amidophenol, by Messrs. Hinton & Co., were distributed among the members, the results to be produced on another evening.

Brixton and Clapham Camera Club.—January 7, the President (Mr. A. R. Dresser) in the chair.—Mr. H. M. SMITH, of Eastman's Photographic Materials Company, Limited, gave a demonstration of the Kodak cameras, including the new "No. 5, folding," which, as now constructed, can be adapted for use with glass plates as well as films, concluding his lecture by showing a number of slides made from Kodak negatives through the lantern. The Chairman mentioned that he had always advocated the use of films. Subsequently to this the Incandescent Gas Light Company, Limited, gave an illustration of the method of using their light in the lantern. The opinion was that, though not so powerful as limelight, it possesses many advantages over oil, and, with some slight improvements, might be a very fair substitute where the former could not be obtained.

Croydon Microscopical and Natural History Club (Photographic Section).—January 8, Mr. W. Goode in the chair.—Mr. JOHN WEIR BROWN read a paper on *Some Further Experiments on Toning Bromide Prints with Uranium*. Mr. WEIR BROWN observed that there were many methods now suggested, and what he had done might lead others to take up study, and perfect the process. In conclusion he said: "I should like to be allowed to make a few remarks in the way of a personal explanation, there having been one or two paragraphs in the papers seeking to discount the novelty of the system I have described to you. Now, I wish to say that I have never made, till now, any claim to the origination of this process. But I have, from first to last, freely given the results of my experiments for the production of warm tones on bromide paper to the photographic public through the medium of THE BRITISH JOURNAL OF PHOTOGRAPHY, and at the meetings of this and other societies, without thought of any credit or acknowledgments which might be bestowed on me, but simply for the pleasure of being able to contribute my mite to the sum of knowledge, and for the benefit of my brother lovers of the art; but, when the good people over the water go out of their way to annex the credit that has been earned on this side, you will, perhaps, concede that it is not more than ordinary weakness of human nature to wish to speak out in defence of our claims. Those of you who remember my first publication of the uranium toning process, more than a year ago, will know that I acknowledged my indebtedness for the suggestion of the means I adopted to a formula for negative intensification by Vogel, jun., which was published in the 1891 ALMANAC. The feature of this formula was the addition of acetic acid; for uranium intensification, without the acid, was used and abandoned more than twenty years ago. I could not claim—and, as you see from what I have said, I have never claimed—to be the originator of acid uranium intensification; but have simply urged the adaptation of the formula to the toning of prints on paper. In this respect I am not aware that I have been anticipated; but, as our American friends, who, with very natural patriotism, think that all good things emanate from their side of the pond, have thought fit to try to push me in a corner, I think I may fairly venture to lay claim now to the application of the acid combination as a toning agent, until they are able to show a prior publication."

Richmond Camera Club.—January 8, Mr. Cembrano in the chair.—Mr. ENNIS read a paper on the recent exhibition of the Photographic Society of Great Britain. After commenting on the return to warm tones and other general features of the exhibition, Mr. Ennis called attention to the pictures of most of the leading exhibitors and others worthy of notice, his remarks showing that considerable artistic knowledge had been brought to his study

of the exhibits. He also remarked upon the carelessness and lack of taste shown in too many instances in the mounting and framing of the pictures, many of which were spoilt by the obtrusive ugliness of their accessories. The discussion was continued by Messrs. Cembrane, Davis, Ardaseer, Whipple, and others.

Herefordshire Photographic Society.—January 5, Lantern evening.—The competition slides were put on the screen in order of merit. The next lantern evening will be held on Tuesday, February 2.

Lewes Photographic Society.—January 7.—A collection of prize slides was shown. Mr. Percy Morris, School-hill, Lewes, having consented to act as joint Hon. Secretary to the Society, communications should be addressed to him until further notice.

Sheffield Photographic Society.—January 1.—Mr. PAUL LANGE (President Liverpool Amateur Photographic Association) gave a lecture on *Norway*, illustrated by limelight views.

Rotherham Photographic Society.—January 5, Paper by the President (Dr. F. B. J. Baldwin) on *Focussing*.—In a very comprehensive way the subject was dealt with, special negatives having been prepared for illustration. Pinhole work and the uses of lenses were also referred to. The general business of the meeting included the granting of a guinea to the Maddox Testimonial Fund, and the passing of a vote of condolence with the family of Mr. Luke Berry, a member of the Council, and whose death had occurred since the previous meeting. Mr. T. W. Mosby was elected to the vacancy.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

THE TELEO-PHOTOGRAPHIC LENS.

To the EDITOR.

SIR,—I regret I cannot compliment you on your editorial comment on my paper recently read at the Camera Club, at least as regards yourself. It is no "inconvenient reproach," or reproach at all, to me that I do not carry in my head a list of the efforts that your paper has chronicled for the last eighteen years of what has been attempted, and not done. I may again remind you that I invited you to call at my office on September 24 last—prior to my first "application"—with the object of showing you the new instrument and its performances. I did that with the object of asking you in a friendly way if your long and practical experience had ever led you to believe that such an instrument had before existed. On that occasion, in addition to showing you the image-forming powers of the lens, I also showed you that its construction permitted of its being employed as a Galilean telescope. It was in reference to this matter that you were good enough to express astonishment; and I think my memory is to be trusted, inasmuch as an expression of "astonishment" from a man of your practical experience would naturally be construed by me as a confirmation of its novelty, and would, therefore, be impressed upon my mind. However, let me call your attention to one or two facts. You say, "It was only at the Camera Club that we learned, for the first time, the construction of the negative lens of the combination;" yet you did not deny that I had made a rough drawing of the combination for you on October 13; and, in your editorial notice on my letter referring to this fact, you state "the drawing referred to by Mr. Dallmeyer was a positive lens (achromatised on the Gauss principle), with a negative lens placed in the same position as that shown in Dr. Miethe's drawing." Thus, sir, it appears you did not have to wait for the Camera Club meeting, as you infer, to learn, for "the first time," the construction of the instrument.

Again, in your issue of the October 30, when Dr. Miethe first contributed anything on this subject, he states, "It is formed on the principle of the Galilean telescope; but, having reference to the object in view, it differs considerably in detail from it." There is no editorial comment to that letter proclaiming the lack of novelty of construction. Again, when I wrote to know Dr. Miethe's date of "application," in your editorial comment you note the date of my "application," and only ask, "Can Dr. Miethe antedate this?" The above remarks speak for themselves as to the matter of memory between you, Mr. Editor, and myself.

Now, as to the quotations in your last issue. What do they prove? That the adaptation of the Galilean telescope for ordinary photographic purposes has been found useless. When attempts have been made to use it, the few experiments related are accompanied by the expression, "Although there is a fair degree of sharpness in the centre of the picture, it unfortunately does not extend to any distance from the centre." Again, "When used as an objective for the camera, it produced images of great sharpness in the axis."

I notice your extract from the ALMANAC of 1877, with reference to an image of the sun being taken. That I can quite understand; but it was the sun, remember, with its great amount of light, and nothing else, that was produced. It was not a pastoral subject taken on a November day! A Galilean telescope is not a photographic lens. The corrections, the manner of use, and disposition of the pencils of light, in employing the Galilean telescope as a telescope, are essentially different from employing the same instrument as a photographic lens, and, as such, of course it is practically useless.

I conceived the advantage that would accrue in constructing a photographic lens having the property of a very wide range of foci in itself by slight adjustments of the lens and focussing screen, accompanied by other advantages such as have, I believe, never existed in any photographic lens hitherto constructed.

In your leader of the 19th of September, 1873, a part of which is quoted in your last issue, you omit, curiously enough, the concluding paragraph, which you particularly pointed out to me at the Camera Club after my lecture. It is as follows:—"Opticians have done all in the way of making wide-angle lenses demanded by photography or permitted by theory; but it might be worth while to devote some attention to the opposite side of the question, and see if a combination could not be made which would project on the ground glass of a camera of moderate length an image of three or four times the apparent magnitude of objects in nature. That such a lens would create useful applications for itself cannot be doubted." That, Mr. Editor, if you will allow me to say so, was worthy of your practical acquaintance with what had been accomplished in photographic lenses, and a valuable hint as to a novel direction for those competent to work in, in order to advance the science of photography.—I am, yours, &c., THOMAS R. DALLMEYER.

25, *Newman-street, Oxford-street, W., January* 11, 1892.

[With respect to the "inconvenient reproach," is it not always considered a portion of the duty of a patent agent to search likely records to ascertain whether the invention to be patented is new? We repeat, it was only at the Camera Club meeting that we first learnt the construction of Mr. Dallmeyer's negative lens; for on the occasion referred to, on the 13th of October (several days after the date of his application for a patent), he certainly did make a rough drawing—not of the "Combination," but of the front or positive lens only—indicating, not the form, but the *position* only of the negative lens by three elongated dashes, which conveyed no idea whatever of its construction. In regard to the covering power of our old Galilean, we said that this was limited, the sharpness being confined to only a few inches around the centre. But let it be remembered that it was mounted not on a *small* camera, such as that shown by Mr. Dallmeyer at the Camera Club, but on one the ground glass of which is twelve inches square. Let it be further remembered that no diaphragm was employed, for this was prior to the introduction of rapid dry plates, and it will be conceded that to cover even a 5×4 plate with a fair degree of sharpness, by a lens not specially constructed for photographic use, was not a bad feat for what Mr. Dallmeyer correctly terms a non-photographic instrument, although not so "practically useless" as he would have us imagine. Without going further into the matter at present, we quite endorse what we wrote eighteen years ago to the effect of the desirableness of opticians (by whom we mean practical manufacturing opticians) devoting attention to this phase of photographic optics; and we have only once more to repeat, that we are much pleased that, even after waiting eighteen years for it, our aspiration has now been fulfilled by this teleo-photographic lens of Mr. Dallmeyer, which, we know, will be useful for many purposes, and hope will meet the commercial success we feel assured it deserves.]

THE "NEW" TELESCOPIC LENS OF MR. DALLMEYER NOT NEW IN THE UNITED STATES.

To the EDITOR.

SIR,—On the table before me is a corrected meniscus of about six and a half inches negative focus, which screws into the lower end of the draw-tube of my microscope. This lens has been in use for extending the back focus of my microscope objectives (and thus doing away with an eyepiece as a projecting lens) in photo-micrography for about a dozen years. Your readers may be further interested to know that this lens was made on a formula on which years before a lens had been made by the late Mr. Telles, of Boston, U.S.A., for the late Dr. Woodward, of Washington, and with which lens, as a part of his apparatus, Dr. Woodward made his famous photo-micrographs. Further, at the same time Mr. Telles made the Woodward "amplifier," Mr. William Wales, of Fort Lee, N.J., made similar concaves corrected for photo-micrography. Messrs. Bausch & Lomb, of Rochester, N.Y., catalogue a similar lens for photo-micrography. If I am not mistaken, Dr. R. L. Maddox, of Southampton, had and used a Wales amplifier many years ago. As to the application of the principle in other directions, the great American optician (who, by the way, used fluor spar in the nice corrections of microscope objectives about twenty-five years before the secret of apochromatics was known), Mr. C. A. Spencer, of Canastola, N.Y., made *large-aperture* and *short-focus* equatorials, provided with a concave lens similar to the Dallmeyer. Such a telescope I have seen on numerous occasions. Mr. Spencer, and Mr. Tolles as well, made *short* pocket telescopes of exceptional power and definition by introducing a lens similar to the Dallmeyer. Such telescopes I have also seen. The late Mr. Malcom, of Syracuse, N.Y., I used occasionally to see at work on his rifle telescopes, which went to all parts of the world on their reputation for power and definition, the secret of which was the introduction of a concave similar to the Dallmeyer. All these makers were active a generation ago, and all but Mr. Wales death has silenced.

The famous results obtained by Dr. Woodward, and the satisfaction I have had in working with my meniscus, led me not long since to ask Mr.

Lees Curtels, of the house of Mr. Charles Baker, London, agent for Mr. Zeiss, to try to interest Mr. Zeiss or Professor Abbe in making a concave (with only two reflecting surfaces, while the projecting eyepieces now used have four) corrected for extending the back focus of apochromatics. At least on the other side of the Atlantic the principle of the Dallmeyer telescopic lens has been practically applied for a good many years. I remember constructing seventeen or eighteen years ago a telescope on this principle, copying a Spencer instrument, with two stiff paper tubes, home-made wood turnings, two lenses from half a "field-glass" and a microscope eyepiece.—I am, yours, &c., A. CLIFFORD MERCER.

London, January 8, 1892.

[The application of a concave lens to the microscope, as mentioned by Dr. Mercer, while known for many years, is not quite the same as in the Galilean telescope, in which the concave must be of shorter focus than the convex element.—ED.]

OXYGEN CYLINDERS AND GAUGES.

To the EDITOR.

SIR,—My attention has been called to a letter, signed "Arthur Seet," in your issue of the 18th ult. May I be allowed to reply to one or two statements in the first paragraph of the letter, as they seem to me rather confused, and possibly might mislead some of your readers. Mr. Seet says: "Considering the time they have been in use, there may have been quite as many accidents with cylinders as with bags." He also refers to two accidents, as proving that the coroner at Ilkeston was ill-advised in recommending the use of cylinders, instead of bags. I may say that it was the jury, not the coroner, who made this recommendation, possibly influenced, not only by my evidence, but by Mr. W. I. Chadwick's statement that he had discarded the use of bags in favour of cylinders. So far as my own evidence related to the use of cylinders, it was simply a statement that such an accident as the Ilkeston explosion could not have happened if Mr. Scattergood had been using cylinders instead of bags. If he had been supplied with two cylinders, one containing oxygen, and the other coal-gas or hydrogen, neither a mistake on his part nor defect in his fittings could have resulted in a mixing of the gases in either of the cylinders, because the pressure of gas in either cylinder while in use is greater than the pressure in the connecting tubes. I also described the precautions taken at the works to prevent accidental mixture of the gases during compression. These statements, and the fact that, since high-pressure cylinders were introduced—now seven or eight years ago—there has never been an accident with one of them outside the works, moved the jury to add their recommendation to the verdict. As there are now thousands of cylinders in use, and as every user of them has had to learn how to use them in this short period, I submit that the jury were not so ill-advised as Mr. Seet appears to think. The two typical accidents referred to by Mr. Seet do not affect the above statements, I think. The first of them happened in the works, under special conditions not likely to occur again. Of course, workmen run special risks when filling high-pressure cylinders which are not shared by the public, and there have been several accidents in the works, which, however, do not suggest that the public run the risk of similar ones. Indeed, one of the safeguards which the public may be said to enjoy is the fact that, should a cylinder be in any way untrustworthy, or the filling of it in any way careless, the chances are that the man who fills it will suffer any unpleasant consequences which may ensue. The second accident referred to was caused by the explosion of a gauge, not of a cylinder. The risk of such accidents is not inseparable from the use of cylinders. Of course, cylinders cannot be used without fittings, and, in a sense, accidents with fittings may be classed as accidents with cylinders. But a distinction should be drawn more clearly between them, I think, than is drawn by Mr. Seet, because dangers in the use of fittings have to be, and, I think, can be, specially guarded against. As regards the cylinders themselves, the conditions of safety have been pretty thoroughly ascertained, and are so simple that every user may obtain the knowledge of them on which alone an intelligent confidence in them can be based.

With respect to gauge explosions, I should like to add, while writing to you, that I think, sir, your condemnation of the Bourdon high-pressure gauge, in your issue of the 11th ult., was too sweeping. There is strong reason for the belief that all explosions of gauges hitherto have been caused by the ignition of hydrocarbon in some part of the gauge-tube or connection by the heat liberated when the column of air in the gauge-tube is suddenly compressed by the rapid admission of high-pressure oxygen, as pointed out in the article of mine which you kindly published in your issue of January 9, 1891. Since writing that article, I have observed that the presence of an explosive mixture of gases in the tube is not at all necessary for the ignition of this hydrocarbon. The sudden compression of the air in the tube is quite sufficient. When the gauge is properly fitted with a check to prevent a sudden admission of oxygen, or when proper precautions are otherwise taken to prevent this sudden admission, no explosion can occur. My Company have sent out some hundreds of gauges so fitted, and we have never heard of an accident with them. I may add that this precaution of slowly admitting oxygen from a high-pressure cylinder should always be observed when using any connexion which consists of a closed tube which may contain traces of grease or hydrocarbon.—I am, yours, &c., W. MORTON JACKSON.

Manchester Oxygen Company, Limited, Manchester.

To the EDITOR.

SIR,—On January 25, Mr. C. F. Budenberg, of the firm of Messrs. Schäffer & Budenberg, one of the largest makers of gauges, will give a paper on *Pressure Gauges for High Pressure Gases* before the Lantern Society, at 20, Hanover-square.

If any of your readers have any remains of gauges or regulators which have exploded or fused, I should be very much obliged if they would lend me them for the occasion.—I am, yours, &c.,

CHARLES E. GLADSTONE, *Hon. Sec.*

6, *Bolton-street, W., January* 12, 1892.

THE PHOTOGRAPHIC SOCIETY.

To the EDITOR.

SIR,—The doings of the Photographic Society of Great Britain have lately attained such prominence that it may seem unnecessary to remind members that we are almost on the eve of the annual meeting and election of officers, and that nominations must be sent in by the 19th instant. I would earnestly beg my fellow-members to take a more active interest in the affairs of the Society than they have hitherto done, and not only to send in nominations for Council and officers, but to attend the annual meeting and exercise the privilege, which can only be enjoyed on that occasion, of offering criticisms of the past and suggestions for the future. At the annual meetings for some years past, out of the hundreds of members, only a handful have been present in addition to the members of Council. Cannot this be remedied next month? The new Council will certainly enter upon their duties with more zest if they feel that the members are taking a lively interest in their doings, instead of "sitting on the fence," and waiting for an opportunity of catching some one tripping.

I am actuated by no party spirit in making these remarks, but only desire to point out that no Council, however good, can assure the prosperity and success of a Society without receiving the cordial and spontaneous support of its members.—I am, yours, &c., EDGAR CLIFTON.

27, *Hanley-road, Hornsey Rise, N.*

AN EFFICIENT HAND CAMERA.

To the EDITOR.

SIR,—In your "Answers to Correspondents" in THE BRITISH JOURNAL OF PHOTOGRAPHY, December 11, 1891 (to which my attention has been directed by a friend, and which I had overlooked, otherwise I should have replied before this), I find an article of mine is called in question that was inserted in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for the present year.

Although I have had no intention of patenting the camera or protecting it in any way, I cannot see how I can have copied Mr. Miller's camera, when my first and only knowledge of its existence is shortly described in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for the present year, although I have searched in volumes and ALMANACS for 1890 and 1891 without finding any mention of it. In sending the short description given in the ALMANAC for the present year, Mr. Miller claims that his camera is free from springs and pushes; mine has both. Will Mr. Miller kindly state wherein my apparatus is like his invention?—I am, yours, &c.,

Southampton, January 6, 1892. GEO. W. VALENTINE.

FRENCH PATENTS.

To the EDITOR.

SIR,—Your very interesting last number duly to hand. Allow me, please, to make a slight suggestion *re* your "French Patents," page 21. You say England has taken more patents than France. There is always two sides to a question, and the other side is, Which are the most *valuable*, and the most *in actual use*? It is easy to take out a patent, but to sell the article is another thing. Then, again, maybe the Frenchman is more liberal; if he invents something good, he may be apt to give the benefit to the general public. This may be worth your while looking into when you put *la Perfide Albion* against *la Belle France* in comparison as to patents and their *actual value*. Not long ago you found yourself patents taken out too lavishly for trinkets never used.—I am, yours, &c.,

Asnières, January 9, 1892. ALBERT LEVY.

Exchange Column.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

A. H. Poole, Waterford.—*Parade of police on the Mall, Waterford. The High Sheriff announcing result of poll from Town Hall, Waterford. Mall and Town Hall, Waterford. Waterford from Mount Misery.*

HALIFAX.—The picture should face page 514 of the volume.

T. EDGR.—Apply to Winsor & Newton, or to Newman, Soho-square.

W. MELLING.—There is something wrong with the crayons. Try black chalk.

JOHN W. MARKS.—Try a mixture of dragon's blood and aurine in spirit varnish.

F. WILCOCKSON, F. K. Barclay, General Dawson, and others.—Received. Thanks.

CONSTANT READER.—Of Messrs. Eyre & Spottiswoode, Fetter-lane, E.C., at the cost of a few pence.

C. BENNETT.—We believe that you would be liable to the duty if you used a patron's arms and crest for your card.

P. C. PORTER.—To re-black diaphragms first thoroughly clean and then treat with a solution of silver and copper nitrate, and apply heat.

K. MICHAEL.—Recommending "good paying businesses" is hardly within our province. Advertise in the outer columns of the JOURNAL.

B. J. S.—Coat the wooden dish with a mixture of beeswax and resin. These must first be melted together in the proportion of one of resin to two of wax.

E. WEEKS.—While it is grossly uncourteous in the Belfast advertiser not to have replied, he may possibly be in communication with the foreign photographer.

J. C. S.—Dry soda and potash carbonates will suit either dry eikonogen or hydroquinone. You will find various formulæ for the proportions at pp. 767-773 of the ALMANAC.

SOMERSET.—The developer appears to us far too strong in sulphite, which, in the proportion you name, would have a very marked restraining action. Try the effect of reducing it, say, to four ounces.

GREENHORN.—They are principally done in Germany by a photo-mechanical process, but we cannot give you the address required. Apply to some large firm, such as Waterlow's or the London Stereoscopic Company.

R. GRAVES.—As a rule, coloured photographs are not admitted into photographic exhibitions. An exception is, however, usually made in the case of photographs coloured mechanically—photo-mechanical prints in colour, for example.

W. P. W.—The yellowness was probably due to citrate of silver, which blackened in the light. The yellowness would have made no difference in use. Make up a fresh solution and keep from the light. Any good soft gelatine will answer.

W. M. L.—To make small negatives from large ones, first print a transparency from the negative by contact. Then from that make the small negative in the camera. Proceeding in this way, there will be no difficulty in obtaining any amount of "pluck."

W. DEE.—The majority of the illustrations referred to are by the zinc-etching method. A print from a negative, from a drawing specially made for the purpose, is made on zinc in bitumen or bichromated albumen, and then bitten in with dilute nitric acid.

W. A. J.—In printing on bromide paper by artificial light, there is no necessity to interpose ground glass between the light and the negative, supposing the light is a moderate distance away. The ferrous oxalate developer is the one most used for the purpose.

PARSEE.—Procure a copy of the current ALMANAC. In it you will find all four of the formulæ you are inquiring for, also many others that will assist you. For negatives pyrogallic acid is the developer most generally employed here, and for bromide paper the ferrous oxalate developer.

A. DIGBY.—With a lens of the "rapid" type of twelve inches focus you will not succeed in copying a line engraving, sharp to the corners, without a very small stop is employed. Indeed, then we doubt if the result will be satisfactory. A lens of longer focus should be employed for such work.

BLUE.—Unless your consumption is much larger than we gather from your letter it is likely to be, our opinion is that you will find it cheaper to purchase the paper ready prepared than to prepare it yourself. Some little skill is necessary to coat very large sheets evenly, and some waste must be entailed until it is acquired.

ASSISTANT writes: Could you help me out of this difficulty? I am trying to retouch on an unvarnished negative with medium, but the strokes show in the printing. I have followed the instructions—put it on very thin and also thick, and tried all ways. Why I think it is the medium's fault is, because I retouch always on a varnished negative with a surface got by resin, and I am now trying on unvarnished negatives, and cannot succeed on them. I can retouch very well on the others (varnished)."—It would seem that the medium is put on too thickly. Only a mere trace should exist on the negative. If a thinner coating does not obviate the difficulty, try another sample of medium.

JAS. TAYLOR writes: "I will be obliged if you will advise me through THE BRITISH JOURNAL OF PHOTOGRAPHY how I can preserve the black in finishing bromide enlargements with chalk (*Sauce Velours*). I rub the enlargement with powdered pumice to give a tooth, and on stumping I always get it to work brown."—Perhaps some of our readers who are *au fait* with chalk work will supply the desired information.

P. H.—There are no works published on photo-mechanical printing in colours. All those who are the most successful workers in the higher branches of photo-mechanical work keep the details of their methods as trade secrets. All that has been published on the subject has, from time to time, appeared in back volumes of this JOURNAL. A brief description of most of the methods will be found in Burton's *Photographic Printing Processes.*

W. SHAWCROSS.—1. The word "achromatic" means freedom from colour. Some field glasses are achromatised by having each lens formed of three component parts, and this permits of a greater magnifying power being attained. But brilliancy of image, with less magnification, can be secured when the front glass is formed of only two elements, and the eyepiece of one. 2. You may continue the use of the indiarubber sheeting without the apprehension of any injurious effect.

S. HOPKINS sends some prints (vignettes), mounted on chocolate-tinted mounts, that are badly stained in the whites, and wishes to know the cause. He adds, there are no stains on the pictures before they are mounted; they only appear when they are dry and ready for rolling.—It is the fault of the mounts. The coloured surface is soluble in water. If it be wetted with the tongue, the colour comes off; if touched with the finger, such mounts are sure to stain.

A. ANDERSON wishes to know how he can take portraits at a fancy-dress ball which is to be given at the local assembly-rooms next month? He says the electric light will not then be laid on, and wants to know the next best light to use, and also our opinion as to whether taking portraits on speculation would be likely to prove remunerative.—The best light, next the electric, to use under the circumstances is the magnesium flashlight, and it is the light most generally employed for such purposes. With regard to the commercial question, we cannot offer an opinion beyond saying it is frequently done.

J. P. says: "A month ago I made up a saturated solution of sulphate of iron, and filtered and acidified it, and next day used some for making ferrous oxalate developer. It was then all right. On going to use it a few days ago, I was surprised to find that a great deal of the iron had separated, for there were a lot of crystals at the bottom of the bottle. What could be the cause?"—What has taken place is simply this: A saturated solution was made at a certain temperature, and has since been subjected to a lower one, consequently a portion of the iron salt has crystallised out. A saturated solution at one temperatnre may become a supersaturated one at another, and therefore deposit some of the salt. It is always better to make solutions to a definite strength than to use "saturated" ones, which are always more or less indefinite.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—January 18, 1892, Social Evening.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—January 21, Monthly Lantern Night. Visitors invited.

PHOTOGRAPHIC CLUB.—January 20, *Stereoscopic Photography*, Mr. J. Nesbit. January 27, Annual Lantern and Musical Entertainment (ladies' night).

NORTH LONDON PHOTOGRAPHIC SOCIETY.—January 19, 1892, Mr. E. Clifton, *The Dark Room.* Commence at 8.15 p.m. Visitors are invited.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.—Annual meeting, January 19. Mr. J. Brown will read a paper on *Platinum Toning as applied to Gelatino-Chloride Paper.*

MESSRS. WALTER GRIFFITHS & Co., of Highgate-square, will shortly open new premises at 5, Union-passage, Birmingham, as a general store for photographic materials and apparatus. Mr. M. O. Suffield will have the management of the new depot.

BRIXTON AND CLAPHAM CAMERA CLUB.—January 21, *Printing Processes.* February 4, Address by Mr. A. Pringle. 18, *Lenses, their Properties and Uses.* Mr. Henry Crouch. March 3, Open Lantern Night. Slides shown and described by Mr. B. G. Wilkinson. 17, Annual General Meeting.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—January 19, Lecture by Mr. Chapman Jones on *Distortion of Outline in Photography.* 26, Discussion on the *Relative Merits of Different Processes for the Production of Lantern Slides.* February 2, Lecture by Professor R. Meldola, F.R.S., on *Photography as a Branch of Technology.* 9, Anniversary Meeting. 23, *Printing Out Emulsion Papers.*

IN consequence of his engagement with Messrs. John J. Griffin & Sons, Limited, of 22, Garrick-street, having terminated on December 31 last, Mr. R. C. Murray announces that he has opened premises at No. 8, Garrick-street, W.C., for the manufacture and sale of photographic apparatus, materials, and chemicals. Mr. Murray's long experience as a practical photographer and as a manufacturer of apparatus should be a complete assurance that the interests of purchasers will be safe in his hands. We wish Mr. Murray every success.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1655. Vol. XXXIX.—JANUARY 22, 1892.

POTASSIUM FERRIDCYANIDE AND AMMONIUM SULPHOCYANIDE REDUCER.

In the reduction of over-dense negatives by chemical, as opposed to mechanical, means, two simple principles have long been utilised. These are the conversion of the metallic image into a salt of silver, and the dissolution of the converted portions of the picture in hyposulphite of soda. In so far as gelatine dry-plate work is concerned, these principles are subjected to little, if any, variation, and they probably form the basis of most, if not all, the reducers in common use.

Typical of these, and at the same time the one most generally employed, is Farmer's solution. This, as our readers well know, consists of a mixture of ferridcyanide of potassium and hypo. The action of the first-named body upon the metal of the negative image is to change it to the state of silver ferrocyanide, which salt is soluble in hypo. Practically speaking, it is possible in this manner to remove the whole of the silver from a negative, leaving what is virtually a clear film on the glass. We say virtually, because hardly any reducing solution that we are acquainted with is capable of taking out the whole of the impression from the gelatine, in which, after all the silver has been dissolved away, a faint image generally remains, the composition and the cause of which have never yet been clearly explained.

From the foregoing it will be evident that the strength of potassium ferridcyanide determines the degree of reduction of the negative, and this fact obviously affords considerable scope in its application. Local, as well as slight general, reduction is thus easily effected, whether a negative or a silver positive on paper be in question, the function of the hypo being simply to dissolve out just so much of the picture as has been altered to silver ferrocyanide.

One advantage of reducers of the ferridcyanide and hypo class is that they may be employed before the negative is fixed; but, in actual practice, we do not think that this advantage is much availed of. It is most likely that reduction of a negative is not decided upon until it has been fixed, washed, and dried. It is a moot point whether photographers would not prefer to use a reducing solution in which their old friend and enemy, hypo, played no part, since it is apparent that, as a solvent of the converted image in reduction processes, it demands hardly less care in removing its last traces than when it is employed for dissolving out the unaltered portions of the newly developed negative.

Such a plan—one, that is, not involving the use of hypo—is at hand in that recently proposed to us by Mr. A. Haddon, and by him subsequently brought before the Society of which he is a member. It will be recollected that in our article of December 24 last, describing Mr. Weir Brown's modified uranium toning process, the total removal of the developed silver image was stated to be effected by Farmer's solution of ferridcyanide and hypo. Mr. Haddon points out that there is considerable danger to the stability of the uranium image possibly from the hypo itself, which may be alkaline, or the washing water, which may also have a similar reaction, an alkaline solution easily dissolving ferrocyanide of uranium. He further goes on to suggest the removal of the developed silver image by means of a solution of potassium ferridcyanide and ammonium sulphocyanide, the latter taking the place of hypo as a solvent of silver ferrocyanide. This solution may be used in an acid state, and thus all danger to the stability of the uranium picture is averted.

Mr. Haddon made several other suggestions of probably considerable value in connexion with uranium toning, to which we may advert on a future occasion. For the present, however, we will content ourselves by pointing out the applicability of potassium ferridcyanide and ammonium sulphocyanide as a reducer for negatives as well as silver positives on paper. We have ourselves submitted it to practical tests, both with very dense negatives and over-developed bromide prints, with satisfactory results. The ferridcyanide is best employed in a weak solution of from five to ten grains to the ounce, the sulphocyanide being, of course, used in considerable excess. Apparently the mixed solution keeps well, although, of course, we have not been able to give it an extended trial; but, in an acid state, its activity is much retarded, while, on the other hand, its tendency to stain is diminished. Used in a comparatively powerful state of concentration, we have observed that it is most energetic as a solvent of silver, and hence we repeat that a weak solution is best in use, otherwise the half-tones of the picture are placed in danger.

As we have before remarked, where there is a desire to avoid using hypo in reduction methods, the above plan of Mr. Haddon's will commend itself. We shall watch with interest the practical experiments and experiences of those who may be tempted to give it a place in their formularies.

VIGNETTING ENLARGEMENTS.

Vignetted busts are undoubtedly the most popular form of enlargement at the present day, and, when well executed, there cannot be a more pleasing style of portrait; but, if the vignetting be badly or carelessly done, no matter how otherwise good the picture may be, the result is worthless from an artistic point of view. So well recognised was this fact in connexion with *carte-de-visite* and cabinet portraits, that vignetting has been almost regarded as a higher branch of printing, and, in most instances, a special price—fifty, or sometimes a hundred per cent. over that of plain prints—was charged.

Numerous were the devices adopted in order to secure the most perfect gradation possible; indeed, almost every printer of any standing had his own particular method. From the well-known "vignetting glass," which, though theoretically perhaps the best expedient, was in reality the most unsatisfactory, through various styles of more or less elaborate marks, we might pick our way from improvement to improvement without arriving at perfection, and even with the best of these numerous aids, as much was, perhaps, left to the skill and care of the printer as the vignetter itself performed, the common vignette glass alone excepted, for this defied the highest skill to better its results. Theoretically, we say the principle of the vignette glass was as near perfection as possible; a sheet of coloured glass, "flashed" on one side with a non-actinic pigment, had an oval or other shaped aperture etched out in its centre until the whole of the colour was removed, and the edges of this opening were gradually softened by the same means until the full depth of tint imperceptibly merged into the colourless centre. Such at least was the idea; but, unfortunately, the gradation too frequently partook of the character of a series of plainly distinguishable concentric zones forming well-defined steps, as it were, or, in other cases, the softening was of so abrupt a nature as to be undeserving of the name of gradation. Such a vignette was palpably useless for the production of good results, as its inherent faults were altogether beyond remedy.

The more careful class of printers made use of various kinds of masks perforated with apertures, usually with serrated or broken edges, and these were placed at a distance from the negative in order to soften the light as much as possible, without allowing it to spread too far, and tissue paper or ground glass was frequently employed in addition, to cause still further diffusion. With such aids as these there was scope for the exercise of a great deal of skill, for, while one operator might make but a bungling job of it, another would with the same implements secure results of the highest excellence. But the perfection of vignetting so far as we know it, we may say the ideal, was only reached when the printing frame was kept in constant motion during the period of printing. Some operators would at intervals alter the position of the frame, turning it upside down, then on one side, then the other, imagining that they thus attained a better gradation; but this was in the majority of cases not so, though greater symmetry of the vignetted portion might result. What was required was a constant and regular motion obtained by suspending the printing frame or frames from an ordinary roasting jack, or similar contrivance, so that the edge of the aperture in the mask was constantly casting its shadow, however soft, in a different direction, and so materially aiding in the softness and evenness of the gradation. We have seen vignettes printed in this manner in the sun, without tissue paper to diffuse its rays, that have been almost perfect in their gradation.

These methods, of course, require considerable modification in order to adapt them to the purposes of the enlarger. The vignette glass for his purpose is out of the question as, setting on one side the faults of gradation, unless it were made from optically worked glass, the loss of definition it would cause would suffice to condemn it. The perforated mask with serrated or even plain opening is, however, quite available, and this is the method generally adopted, though the position of the mask in relation to the negative is very different. Instead of being placed at a short distance in front of the negative, it takes a position between the latter and the print, and at a considerable distance from either, the precise position being immaterial provided it is not near enough to the lens to come within range of its focus, or sufficiently close to the print to cast a sharp or perceptible line. Further than this, it is kept in motion during the exposure in order to secure greater softness, the movement being in the line of the axis of the lens, though some operators prefer an up-and-down and side-to-side or circular motion.

Whatever the direction of the motion may be, it cannot be regular in the strictest sense, since it is made by hand, the operator holding the mask in his hand during the exposure. Now, not only is this a tedious business, especially if the exposure be long, but it requires great steadiness, as well as patience, to perform it even fairly well; and even then there is no guarantee that it is applied evenly, or that it is properly centered; for it must be borne in mind that there is no guide to the effect being produced, and the mask may be unconsciously moved some inches right or left, up or down, during the exposure, which is certainly not conducive to uniformity or symmetry. Still, in careful hands, very satisfactory results accrue, though it is our impression that much better might be attained with proper appliances.

It is surprising to us that no attempt seems to have been made, or, at any rate, published, to render the working of the vignetting mask automatic. We ourselves long ago experienced the irksomeness of the hand manipulation, and have from time to time made various attempts to improve upon it. The first of these consisted in mounting the mask upon a sort of easel running on a tramway, along which it might be worked by means of a rack and pinion. This had at least the advantage that the strain was taken off the attention of having to keep the mask centered, but it still had to be worked by hand, and there was no guarantee that it was worked evenly, so that, though portions of the gradation might be smooth enough, others might be abrupt, from stoppage of the machine at some particular point.

Next we tried substituting for the rack and pinion by which the easel was actuated a heavily weighted pendulum, working underneath it, and imparting to it a to-and-fro motion. This was so far a gain that it dispensed altogether with hand work, and the motion was also regular; but, while the mechanism was comparatively complicated, its action was anything but satisfactory, and the movement of the screen was jerky and uncertain, and, moreover, a very heavy weight was necessary to overcome "the traction" of the tramway.

But we recognised the pendulum principle as the correct one, for, in addition to its being automatic and regular, it in itself assists in softening the gradation, since, as each successive beat becomes shorter, the vignetter travels over a constantly decreasing space, so that, in addition to the softness gained by the alteration of position, we have also the softening arising from a gradually decreasing exposure from the centre outwards.

We eventually settled upon a method on this principle, which, while extremely simple, is as nearly perfect in action as could be desired. Discarding altogether the clumsy tramway, we made the pendulum itself carry the vignette, or, in other words, the vignetter forms a portion of the pendulum. This, in our case, works from a fixed point near the ceiling; but it would be a decided advantage to have it work in a movable frame running on castors, or, at any rate, capable of being shifted if required. The pendulum itself consists of a stiff rectangular frame nine feet long and eighteen inches broad,

the top and bottom (or short sides) being of wood, and the remainder light iron rods. The width is desirable to give it a firm bearing on its pivots and to ensure its running in the direct line of the axis of the lens. The mask itself is attached to the side rods, and is made adjustable as regards height.

This arrangement is fixed about midway between the average positions of the lens and easel; as a rule, we work but two or three sizes, but, where a wide range has to be covered, the movable pendulum frame is desirable. The exact position of the mask and its opening are easily found when the pendulum is still by raising or lowering it until the desired effect is obtained on the screen; or, if a special opening be required for a particular negative, the mask itself may be utilised as a focussing screen, and the shape of the aperture sketched thereon. In this manner it is easy to make masks for stopping out single figures from groups, or for printing in clouds to landscapes; in the latter case both sky and foreground may be covered as desired, and the two blended one into the other in a manner scarcely possible by other means.

THE DECOMPOSITION OF HYPO.

A PAPER of great interest to photographers was read at a recent meeting of the Chemical Society, the subject being the changes undergone by "hypo" when in an acid condition. The exact title was *The Change proceeding in an Acidified Solution of Sodium Thiosulphate when the Products are retained within the System*. A number of glass bulbs were filled with solutions of hypo acidified with an equivalent quantity of acid, and placed in a bath at a fixed temperature, and at certain definite times after the acidification the contents of the bulb were titrated with iodine solution; and, among other checks upon the result, the acidity was determined soon after the iodine titration. It is not necessary here to give details of the experiment, the more especially as we shall, in all probability, return to the subject at some future time. As to the results (using the old term, hypo, for brevity), the author (Mr. A. Colfax, B.A., Ph.D.) concludes that the change, when the products, viz., sulphurous acid and sulphur, are retained in the system is a reversible one, a limit being reached a certain time from the time of acidification. The value of this limit is affected by (1) state of concentration, (2) ratio of the mass of acid relative to the hypo, (3) the nature of the acidifying acid, (4) the temperature. Sulphurous acid cannot prevent the decomposition of thiosulphuric acid. The presence of both products of the change in the system seems essential for the attainment of a limit value; for sulphurous acid, when initially present in the system at the time of acidification, has but small effect upon the values expressing the extent of chemical change. A higher temperature favours the interaction of sulphurous acid and hydrogen or hypo, a secondary change which proceeds at lower temperatures with extreme slowness. When this paper is published *in extenso*, we may probably print it in full, as it treats upon a subject upon which, at present, we have very little definite knowledge.

It will be observed that the plan, which is continually increasing in favour, of adding acid sulphite of soda, is not involved in the consideration of the question, and the belief in the absence of change in hypo after such addition is in all probability correct. Certainly no observations of ill effects have been published up to the present time.

But at the same meeting two other papers were read which had a bearing upon the evil effects of acid hypo. All practical photographers are familiar with the dark-coloured deposits appearing in hypo solutions that have been used to fix prints or negatives, and it is no difficult matter to imagine that somewhat similar deposits, invisible to the eye, may be present in photographs fixed in "hypo," and may lead to their fading. The classic researches of Messrs. Davanne and Girard showed that an insoluble colourless silver thiosulphate, gradually decomposing in time, would be so produced when the fixation was carried on in a limited quantity of hypo, but we now refer to further products. Mr. Harold Picton showed that in some so-called solutions of metallic sulphides the microscope revealed the fact that the whole of the sulphides present existed in the form of very finely divided particles, and the same gentleman, in conjunction with Mr. S. E. Linder, advanced what they considered a good *primâ facie* case for the belief that there is a continuous series of grades of solution passing without break from suspension to crystallisable solution. They hold that in the lowest grades of solution a certain loose attraction exists between the particles and the molecules of the solvent. They describe a new property, which seems to hold for a large range of solutions extending from suspension to crystallisable solution.

During the interesting discussion that followed it was mentioned that the microscope had enabled particles of silver nitroprusside, so small as the one-hundred-thousandth of an inch in diameter, to be detected in what was apparently a solution. Mr. Picton's paper stated that the sulphide of mercury he had examined in a so-called solution exhibited small particles under the microscope which were not diffusible even in the absence of a membrane. What is more probable than that the decomposition of the silver salts by hypo in either an albumen or gelatine film, gives rise to insoluble silver salts which would not diffuse by osmotic action, and would therefore remain in the film for future evil? The rate of diffusion in such films would be far slower than in a collodion film; hence, if the production of these hypothetical insoluble products occupied an appreciable time, it might be predicated that in a collodion film the producing salts would diffuse into the outer liquid, in which the precipitation would then take place, while in the case of gelatine or albumen the slower diffusion would retain some of the salts long enough to permit the decomposition and lodging *in situ* of harmful products other than those described by Messrs. Davanne and Girard. The speculation is fraught with interest.

The Originator of the Gelatine Process.—In reference to Mr. W. B. Bolton's article on this subject in our last issue, we have received a long letter from a Mr. J. Faulkner of a highly polemical nature. The interference of Mr. Faulkner in this controversy is clearly not that of a directly interested person having a prescriptive claim to be heard, and we therefore do not publish his letter. It appears to be written in the interests of Mr. J. Burgess. We are at all times glad to give those who are criticised in our columns an opportunity of replying, and we shall be willing to publish a letter from Mr. Burgess himself. There are only two points in Mr. Faulkner's communication which we shall notice. Mr. Faulkner casts doubts on negatives ever having been produced by Maddox's formula. Let him read Mr. W. E. Debenham's testimony to the contrary, given at the meeting of the London and Provincial Photographic Association on December 4, and let him also read Mr. W. Adams' letter in our present issue. He asks how Mr. Bolton knew that the Jury of the Inventions Exhibition awarded a medal to Maddox without dreaming of Burgess? We answer, Simply because Mr. Bolton himself was one of the jurors on that occasion.

The New Methylated Spirit.—Writing to the *Chemical News*, on this subject, Dr. B. C. Waller says:—'There already exists

one way whereby users of methylated spirit may still obtain it unadulterated with paraffin. Apply to the supervisor of the district for permission to purchase the spirit in quantity direct from the manufacturers. The applicant will be required to specify the objects for which he proposes to use the spirit, and his statement and application will go to head-quarters. After the usual business of red tape and circumlocution, it will probably be allowed, and the applicant will then be required to find one surety in a bond for 200*l.* as a safeguard against the application of the spirit to any improper uses. For this bond five shillings is charged. After these formalities are complied with, the holder of the permission is supplied with forms of requisition, and can order direct from the distillers. He also becomes a "user" of the spirit within the meaning of the recent order, and is entitled to requisition supplies free from paraffin.

"A Mischievous Innovation."—"An eminent medical organ learns that in future half per cent. of *wood naphtha* (*sic!*) is to be added to methylated spirit," says the editor of the journal above referred to. "Our contemporary imagines that the mixture will be 'absolutely undrinkable,' which is a mistake. He is aware that the new concoction will be unwelcome to photographers and others, but he thinks that in such a case their complaints should be disregarded. We hold, on the contrary, that an injury to research and to the organic chemical manufactures will be poorly compensated by a hindrance thrown in the way of a few desperate drunkards. It is not too much to say that the Act permitting the sale of methylated spirits is completely stultified by this most mischievous innovation."

Run on a Portrait.—Since the betrothal of the late Duke of Clarence and Avondale was announced, there has been a great demand for the portraits of the Royal pair. But when the illness took a serious form the demand became very much greater. On the day after the death, one London house alone, that happened to possess negatives, we are informed, received orders for many thousand prints, the retail stationers being all cleared out, and were taking orders for future execution. In such cases as this, it seems to be a pity that photo-mechanical work is not more largely utilised than it is. To get several thousand silver prints from a few negatives at this season of the year occupies a considerable time, during which period the passing excitement is abating. With Woodburytype or collotype a few days will suffice to supply all demands. Great as has been the demand for the portraits of the Royal Duke, it is doubtful if the sale in the aggregate has been so great as it would have been had he lived to be married.

Post-mortem Photography.—*Apropos* of the fleeting interest in portraits of deceased persons, those who have had much professional experience in post-mortem photography are fully aware of the expediency of supplying the proofs and obtaining payment as quickly as possible. If this be delayed until after the funeral, it is rarely that the photographs are considered satisfactory, whereas, had they been delivered before that event, they would have pleased. So it is with enlarged portraits of deceased persons. If the picture be delivered promptly, it generally gives satisfaction. But if the work be kept, as some photographers keep it, a month or two in hand, the probabilities are that it will be more severely criticised than would otherwise have been the case. Imaginary faults are discovered by friends, for which there may be no grounds, and unnecessary trouble in alterations, often to the deterioration of the picture, have to be made.

Xylonite in Photography.—Last week we suggested a modified method of working the carbon process so as to avoid the different transfer operations. This was to spread the pigmented gelatine on thin transparent sheets of xylonite or celluloid and then print the picture through this film, as was done with the transparent media used in the earliest days, and before xylonite could be obtained in such a high state of perfection as it can at the present time. Here is another use to which xylonite in connexion with carbon printing may be probably very profitably put. "Porcelains" of the scrap type, made by the carbon process, have had a considerable run during the last few years, but the trade in them is on the wane. One of the reasons for this is that, with an accumulation of them, there is no convenient way of preserving or displaying them, also their fragile character. Xylonite can now be had with exactly the appearance of opal glass, of any tint, or with a grain so like ivory that it can scarcely be distinguished from that material. Now, it is quite as easy to develop a carbon picture on xylonite as it is on opal glass, and the former substance would cost considerably less. A carbon picture on opalescent xylonite or celluloid cannot be distinguished in appearance from one on opal glass, while with the ivory grain it looks much superior. Furthermore, such pictures can be placed in albums, like ordinary ones, on card-mounts, and transmitted through the post without danger of breakage. Here is manifestly a novelty for those who choose to take it up. But we do hope, if it is, that the "cutting prices" of porcelains will never be adopted.

Printing of the Future.—The general consensus of opinion amongst practical photographers is that albumenised paper is now meeting the most formidable rival it has ever had, in gelatino-chloride printing-out paper. On several occasions, when fresh printing processes have been introduced, the knell of albumen has been said to have been rung. Yet it still survives, and is, as yet, the most popular process of the day, and the one most extensively used commercially. There is, doubtless, a big future for the new paper, but albumen will die slowly, we strongly suspect, notwithstanding all that is predicted.

The Price of Platinum.—The metal is now quoted at 2*l.* 2*s.* 6*d.* per ounce. But a short time ago it was nearly double this price.

The Daily Press and Technical Matters.—We have several times of late commented upon the blunders made, and the nonsense written, by some of the daily press when they touch upon photographic subjects. This ignorance is not confined to photography alone, but applies to technical matters generally. *Lightning*, last week referring to electrical matters, says, "How utterly idiotic are the lucubrations of the ordinary pressman when he essays to deal with things he is ignorant of."

Process Work.—The *Daily Graphic* of Friday last is an excellent example of the services that photography renders to illustrated journals and also of some of its short-comings. One of the illustrations depicts a scene in the City occurring in the afternoon of the previous day. But for photography this would have been next to an impossibility in the time. Such things, however, are now daily accomplished by the "photo-zinco" or analogous processes. The number of the paper also contains two half-tone illustrations, one a portrait of the late Duke of Clarence and the other of the Princess Victoria of Teck. These two illustrations, though the blocks themselves are really good, show that they are not well suited for rapid printing in the ordinary way with type. The *Daily Graphic* possesses the most perfect machinery for quick printing of a high quality, consequently we may fairly assume the blocks were used under the best conditions circumstances would allow. We had a large number of the impressions through our hands, and the most striking feature was their inequality. Of some there was nothing to complain, while others were mere smudges. A noteworthy fact was, that although in some copies the half-tone prints were bad, the line blocks in them were equally as good as they were in the best. It is clear that a process that will yield half-tone blocks that can be successfully printed under ordinary conditions with type, on a rapid machine, is still a desideratum.

Mr. Chapman Jones's Lecture.—It is a pity that no more than twelve or thirteen persons attended Mr. Chapman Jones's lecture at the Photographic Society of Great Britain on Tuesday night. The subject, *The Distortion of Outline in Photography*, has perhaps not much of the ring of fascination in it; but it is undeniably one in which every one who takes, or attempts to take, photographs is

directly interested. Mr. Jones's discourse was clear, practical, and not at all above the comprehension of those for whom it was intended, and we regret that the exigencies of space oblige us only to give the briefest possible report of it. Mr. Jones's suggestions as to the use of single lenses in preference to rapid rectilinears when photographing from nature, and his method of testing the curvilinear distortion of such lenses, deserve attention.

ON THINGS IN GENERAL.

Is it permitted to hope that Mr. Newman's paper on *Some Recent Exhibitions*, that was read before the London and Provincial Photographic Association the other day, will lead to some reforms in exhibition matters, though its talented writer is evidently a novice at "judging?" That reform is needed goes without saying, as the French put it; but there are so many interests concerned, so many pet theories held up by Judges, so much indecision as to what should and what should not be allowed, and, above all, so few people among even the experts who have really the courage of their opinions that it cannot but be felt the hope, if any, is of a very pale cast. But the rider to the Report of the Judges of the Pall Mall show may lead to the amelioration of one most glaring evil—the want of discretion shown by hangers on occasion. It needs no argument to prove that the hanger's post is a most difficult and onerous one to fill. But the duties of judging at the many important exhibitions, added to the immense labour of selecting and seeing to the hanging of a large number of pictures—and how laborious and time-consuming such work is none but the experienced have any conception of—occupy too much time to enable us to expect that it can be often taken by the comparatively few men that are suitable for the office. There is great want of backbone shown so far by hangers in general, or, what is worse, most improper favouritism. It cannot be doubted that we have too many exhibitions, and, now that a central representation of the many societies in the country seems to be within measurable distance of realisation, I would ask if a central body could not be chosen to deal with the ethics and practice of exhibiting, to formulate rules for their conduct, and not to give their sanction to any exhibition not carried out under the rules they would frame. Exhibitions might be held under the "Affiliated Societies'" rules, and at once awards so obtained would become of known value, and appreciated by the public at large after no great lapse of time. If such a dream should become true, it is to be hoped that the hideous term "Challenge Class" should be replaced by one less reeking of the shambles and kennel.

The paper read by Mr. Dallmeyer, at the Patent Society, *On Reflections and Refractions*, appears likely to mark an era in optical construction. With the vast strides made of late years in optical methods on dioptric lines, there would not appear to be valid reasons why catoptrics should not be pressed into the service of the lens-maker. We all know why a parabolic curve is given to mirrors for optical use, and why they are not available practically for lens-grinding; but there is now such a range of power put into the hands of the lens-maker, owing to the great variety of dispersion and refraction at command in modern optical glass, that it is reasonable to expect that lens-mirrors with spherical curves could be constructed that should be of considerable utility for each of the purposes named at the discussion that followed the reading of the paper. Of course, to get the full value of the new principle, it would have to be remembered that, for photographic purposes, there would be a very practical limitation of size. The picture producible would always have to be considerably smaller than the diameter of the lens-mirror employed, and a very little knowledge of the art of lenses would indicate the probable price of such an instrument capable of taking a picture not larger than an optical lantern slide. That such pictures would possess a crispness and a richness superior to one taken by an ordinary lens is almost certain, as most, if not all, of the reflection would be got rid of. True, a large "camera" would be needed, as, of course, a conical hood, surrounded by a cylindrical one, all covered by black velvet, would be needed to keep out stray light, and the optical portion would need to be scrupulously clean. *Cui bono?* may be asked; the reply is given at once.

That the patent agent's "life is not a happy one" might certainly be believed from reading two only of the patents, the specifications of which appear in this JOURNAL for January 15. I have carefully read three times over the wording about the transferring photographs patent, but, after such close perusal, I am as much in the dark as before I commenced the task. What the original instructions could have been to allow of no clearer description than is here given is a great mystery. The few gleams of meaning that come to me at times suggest that Herren Zahn and Schwarz have patented something that does not differ in principle from the Autotype Company's "temporary support," and the manner of using it. But this patent is clearness itself compared with Herr Eugen Hakh's. It consists of a method of photographing under a "bound light" in a "revoluble housing," consisting of "trapezium-shaped" surfaces, formed of fabric on frames adjustably arranged at angles to each other, said housing having adjustable light funnel, platform, and stool, and being provided with suitable means for attaching to the camera, &c. Is it possible that we have here some modification of the Lafayette camera stand?

FREE LANCE.

RATIO OF GRADATION.

YOUR review of Messrs. Hurter & Driffield's ingenious if over-refined "Actinograph" reminds me that one of the most important conclusions to which those gentlemen's photo-chemical investigations have given rise has not been taken into consideration by photo-experimentalists and investigators to the extent it deserves, and has also so far remained a dead letter to the ordinary photographer, who consequently believes and maintains the exact contrary. I allude to the theory that the ratio of gradation in a negative or a positive are unalterable by development.

If I understand Messrs. Hurter & Driffield aright, a photographer may, by varying the constituents of his developing solution, alter the printing value of his negative—that is, assuming a correct exposure, he can produce a very thin or a very dense negative at pleasure. But those gentlemen maintain that the photographer's power is strictly limited to this. He cannot by any known combination of developing reagents alter the relative gradations of his negatives. In the case of the thin image, the ratio of the half-tones to the high lights is, we will suppose, as 1:2, that is to say, by measurement the density or opacity of those portions of the negative may be quantitatively expressed in those proportions. Now, it may here be argued that, as a dense image can be developed up from the same exposure (let us suppose a correctly exposed plate has been cut in two for the purposes of the experiment), therefore the ratio of gradation, or density as it is sometimes called, has also been altered. Is this so?

According to Messrs. Hurter & Driffield, it is not by any means the case. They contend (and their experiments bear out the contention) that the ratios of the dense half of the plate are the same as those of the thin negative, and that, upon measurement of the former, the half-tones and high lights stand towards each other, in point of density, in exactly the same proportions as those of the thin half. In the one case they are as 1:2, in the other as 2:4; from which it will be observed that the ratios are, in fact, unaltered.

It appears to me that this theory will not be easily demolished. The idea that photographers are, and have been, able to influence the relative gradations of their negatives with a given developer rests upon a misapprehension. They can only influence their printing values—that is to say, they may change 1:2 to 2:4, or 4:8, or 8:16; in fact, make them dense or thin as they may require; but to produce 1:3 or 2:5—that is, reduce or increase the relative opacity of a certain part of a negative at will, by bringing up the half-tones, and without also proportionally adding to the density of the shadows, is, I think, a proposition that no longer holds good, and, in point of fact, never did.

For, if that proposition could be sustained, it would be equivalent to holding that the developer is discriminating in its action, reducing some parts of an exposed picture and not attacking others. I do not see how any one can regard this as tenable, and yet it is practically what we have all been doing for a great many years past. To my mind, Messrs. Hurter & Driffield's teaching on this point comes to this, that the inter-relations of the effects of exposure upon a sensitive film cannot possibly be altered by the developer. Whether the re-

sulting negatives be thin or dense, the ratios of gradation are always the same, and that it is the light, and light only, which fixes those ratios for us, which the developer is impotent to alter.

As I have hinted, I do not see how this teaching can be negatived except it be argued that a developer has the remarkable property of ignoring parts of an exposed plate at will. In my view and my experience this does not characterise any developer in modern use, and I therefore cannot understand how Messrs. Hurter & Driffield are to be dislodged from their position, that the ratios of gradation in a negative are determined by the exposure.

JAMES R. HOPWOOD, PH.D.

CONTINENTAL NOTES AND NEWS.

Jarret's Teleo-photo Lens.—At the meeting of the Société d'Etudes Photographiques on December 24, M. Jarret, *apropos* of an article in the *Moniteur*, reminded the members that, before Mr. Dallmeyer had dealt with the same subject, he (M. Jarret) had already presented to the Société d'Etudes Photographiques, in October, 1890, an optical combination for taking photographs at a great distance, permitting of a degree of magnification of from thirty to sixty times. On that occasion he showed a number of pictures taken with the objective in question, and M. Jarret now asked that mention of these facts should be made in the Society's report. He also read a letter from M. Toublan, President of the Nantes Photographic Society, certifying that the objective had been in the last exhibition of that Society, where its merits had been recognised.

Restoring Faded Manuscripts.—To restore faded manuscripts, so that they may be more easily photographed, Herr Liesegang recommends passing them through a weak bath of ammonium sulphide

Aquarelle by Daguerre.—M. Thouronde, of the Société Française, noticing among some works of art an aquarelle signed "Daguerre," purchased it, and, to be assured of its authenticity, submitted it to critical examination, as a result of which he became certain that it was a genuine work by this father of photography.

Use for Green Glass.—We read that from a very thin negative a vigorous one may be made by the following plan:—Take a positive by contact from the original weak negative, the light being allowed to pass through green glass, and then a second from the positive, the illumination being again allowed to filter through the coloured glass. Weak development to commence with, followed by a more energetic solution, is recommended.

New Magnesium Powder.—MM. Boichant and Mairet, on January 8, presented the French Photographic Society with a number of fine pictures, obtained by means of an illuminant resulting from the combustion of a powder of their own composition. The pictures were said to be much superior to those generally obtained in this manner. MM. Boichant and Mairet are experimenting with a view to compounding a magnesium powder which does not emit smoke.

M. Lippmann's Experiments.—At the Conservatoire des Arts et Métiers in Paris, and in presence of a numerous audience, M. Lippmann recently discoursed on photography in colours. We are told that, when he threw on the screen a coloured image of the spectrum which he had obtained, there was great applause, which was renewed when he explained that the success of his method proved that he had compelled the light to produce, by means of gelatino-bromide, plates of silver so thin that they were transparent. The colours of the pictures were due to the same causes as the colours on soap bubbles. The comparison is not a good one.

Spanish Dry Plates.—English dry-plate manufacturers will be interested, if hardly pleased, to know that an establishment for the manufacture of dry plates is about to be opened at Barcelona. Native photographers, and patriotically minded Spaniards generally, are said to have long deplored the fact that the "extrangero" should have possessed what is to all intents and purposes a monopoly of the dry-plate trade in Spain, and so at length somebody, with the necessary confidence in his own powers, and, of course (at least, we hope), the necessary amount of capital to back it up, has determined to contest the market with the English and German manufacturers.

International Photographic Exhibition in Paris.—Under the patronage of several of the Ministries an International Exhibition of Photography and its allied industries will be held in Paris, at the Palais de Beaux Arts, from April to September next. It will comprise four principal sections, embracing Historical and Scientific Photography, Amateur and Professional Photography, Applied Photography, and Photographic Apparatus, &c. These principal sections will be subdivided as occasion may determine. M. Attunt-Tailfer, of the Chambre Syndicale des Fabricants et Négociants de Produits et Appareils Photographiques, is President of the Exhibition, M. F. Guelpa being Commissaire-général.

Mercury-silver Development Process.—According to a French contemporary, positive prints may be made by development in the following manner. Paper is first floated on a solution of twenty parts of mercuric chloride in 500 parts of distilled water, and, after drying and washing, is sensitised with five parts of silver nitrate in fifty of distilled water. The paper is exposed (presumably to daylight, but we are not told) under a negative for from twelve seconds to a minute, and the image is developed on a bath consisting of ferrous sulphate one part, vinegar (? acetic acid) one part, distilled water thirty parts, washing and fixing taking place as usual. Of the making of printing processes there is, apparently, no end.

Chronophotography.—The *Revue Generale des Sciences Pures et Appliquées* publishes a lengthy paper, by M. Marey, descriptive of his new method for analysing movements in physical and natural science. Accompanying the memoir, which is divided into eleven chapters, are about fifty illustrations of the apparatus M. Marey employs, together with many remarkably curious phases of movement of men walking, jumping, leaping, and running, horses galloping, breaking waves, and the gyrations of various common "objects of the seashore," herons, ducks, pigeons, flies, &c. M. Marey's paper is probably the longest devoted to this fascinating subject which has appeared in a periodical. *Nature* the other week contained extracts from it, but the paper should be read in its entirety and studied in conjunction with the whole of the illustrations.

Photography and War.—The Franco-Prussian War was a godsend to the French artists, who to this day have never ceased finding themes for their brushes among the incidents of that terrible contest. In a lesser degree one notices the same feeling (possibly sustained by purely commercial instinct) among photographers, whose reproductions of battle pictures are only more numerous than the latter themselves. In the current number of *L'Héliochromie* there is a collotype reproduction of Lebœuf's picture of *Combat sur la Place* (nuit du 18 Octobre, 1870), depicting a bloody contest between two handfuls of Frenchmen and Germans in the corner of a square. The French seem to be getting the worst of it. Is it in order to assuage his readers' regret and mortification at this that the Editor also presents them with a reproduction of the Pantheon picture of *Jeanne d'Arc victorieuse rentre à Orleáns?*

ART? FINE ART? OR WHAT?

[Read before the Dundee and East of Scotland Photographic Association.]

I AM well aware that to not a few the subject I have chosen will be somewhat uninteresting. I think, however, that in our society we deal too exclusively with practical matters, and I am not prepared to admit that such a question as I would discuss is of little or no moment to even the most practical of men. This subject takes one over con-

siderable ground, and involves such questions as "the relation of photography to fine art," naturalistic photography, and the like, and it is only proper that we in Dundee here should devote an hour to the consideration of questions which have mildly excited the photographic world for some little time past.

Altogether apart, however, from these questions it is surely a good thing to discuss the proper sphere of photography, its possibilities or impossibilities, so that, if nothing else be gained, we may at least raise the average standard of work by agreeing what not to attempt.

I know there are some who believe that already all things are possible to photography except the rendering of nature in her own tints. I am sorry that I cannot side with these optimists. I think photography one of the most wonderful things that the genius of man has devised, but I also think that its purposes are in a sense limited. In the very nature of things this must be so, for if we argue for its unfailing truth we cannot at the same time claim that it can idealise the one attribute excludes the other. This limits, either in the one direction or the other, its possibilities in the graphic arts, although this is not always admitted, or, if admitted, absurd attempts are sometimes made to get over the difficulty by sacrificing its truth, in the expectation that idealism may to some extent be introduced, which it is not.

With these few introductory remarks, let us consider in what relation photography stands to *art* or *fine art*, and, having determined this, it will be one step towards determining its legitimate sphere. There are few expressions more difficult of precise definition than the expression "fine art." Some imagine that it has to do with the beautiful. It may, or it may not. Some confound "fine art" with "good taste." It has no relation to good taste. One man considers fine art to be the power of reproducing with great faithfulness what nature has cast around him. Another declares that art is *not* nature, and has no necessary connexion with it. So on it goes, some even going to the length of holding that "fine art" is in the artist only, and that pictures, poems, statues, or music, are not fine art at all, but mere gross expressions of it. In such a labyrinth, one begins to wonder if it is given to man to understand what "fine art" is, or if he must wait patiently for the time when all things shall be revealed. After an extremely boisterous and devious passage, I have steered my ship into what appears to me to be a kind of haven of rest, at least in the meantime, and as one other idea more or less cannot be more than as a drop in the bucket (already I admit over-brimming), I shall proceed with my argument. Since the word *fine* seems to me to be a mere qualification of *art*, a kind of subdivision, so to speak, I shall first try to determine what *art* is, and having determined this, proceed to consider what makes it *fine* art.

Art is a word of very wide significance. It may be the the art of a rider, a wrestler, or for that matter of it the art of a shoemaker. Art is the faculty of getting the greatest possible result out of the least possible means, and the apparent disproportion between the cause and effect is what we measure, admire, and denominate *art*. There may be much or little of it, but the essential meaning of the word is this faculty which enables one man to overtake what another, not so gifted, cannot, although to all appearance equally fit. For example, a strong man and a weak man are in a boat. The weak man is an accomplished rower, while his stronger companion is not. Notwithstanding this, the boat turns in a circle, propelled by the skilful stroke of the weak man; this is the result of his art, and just as the result of his rowing is out of proportion to his mere strength, so is his art greater or less. What we admire and call art here is the *apparent disproportion between the cause and the effect*. Without this *art* the weak man would only pull (as others would) in direct proportion to his strength, he would be overcome by his stronger companion, and we should see nothing to admire or wonder at.

Let us take another example. A forest of trees has to be represented in a picture, and, as in the former case, we contrast two men, one with a certain amount of art, the other without, or, at any rate, with less art than his competitor. After hours, days, or weeks, the "no art" man having laboriously added leaf after leaf at the expense of infinite time and trouble completes his work, while his accomplished companion having no stronger an arm, no better brushes, and no better paint, gives you the effect of a great forest with half an hour's work of his artful hand. Not only so, but the effect being equally good (we shall say), we see nothing to admire in the one case because we could have done as well ourselves in the same length of time, but in the other we wonder at and admire the art which with a few magic touches saves hours of weary drudgery. Now, here again you will notice that what we call art is the *apparent disproportion between the means employed and the end obtained*.

Art is the outcome of experience, and has nothing to do with a man's genius, save that a man of genius acquires art more quickly, and to a higher degree than a stupid person. It has nothing to do with his feelings, ideas, or conceptions, but merely with his power to learn. Do not imagine that my argument intends to prove that much labour necessarily means little art. If the results are so much the grander, so that there still is *the apparent disproportion between the means and end*, the same result is obtained. One sometimes hears the would-be critic wax eloquent in his denunciation over what he calls the "finican" work of certain of our great artists—"it is laboured;" "it is not clever;" "there is no dash in it." This is not the question. The question is:—Is there not, after all the labour, such a disproportion between the means and end as to prove the artist to be possessed of the highest art—never mind the labour, is the result not yet out of all proportion to it?

This is my conception of *art*, and we may now proceed to discuss the further question of what *fine art* is.

After the somewhat elaborate discussion of the term art, it will take only a few sentences to determine what *fine art* is. The very term suggests that it deals with the higher part of man's nature.

It is difficult to define such expressions as "feeling" and "emotion." Fortunately, we all know what is meant by these terms. When we stand before a fine picture, a piece of sculpture, or listen to good music, we are more or less moved; we cannot tell why, but we know to what extent. It is not the mere workmanship, so to speak, that we admire, for a poorly painted picture will sometimes touch the chord against another actually much better done from a technical point of view. We listen perfectly unmoved to a certain air played, perhaps, in a faultless way, while another air strummed carelessly on a worn-out instrument touches us immediately. It is not the association of ideas, for we may never have heard either of them before. Why, then, this difference? Only this, that in the one case the composer had the *fine art* faculty, and was able *to produce emotional results out of proportion to the apparent means*, while the other had not.

It goes without saying that before another can make us feel he must first feel himself, but equal sympathy being admitted, one will have *fine art* enough to give you his whole heart, while another communicates far less. He feels as much, he has not the *fine art* faculty, and although he may have *art* enough to paint a picture or compose a piece of music, it is dead and lifeless, because of the want.

What do we admire in "The Cotter's Saturday Night," or Tennyson's "In Memoriam?" Not, certainly, the mere rhyming, but we wonder at and admire the intense emotional effect produced by causes so apparently inadequate, that we fail to grasp them altogether. This is *fine art*.

Just as in a painted picture, there may be much labour or little labour, the fine art has nothing to do with this; but, is the emotional effect out of proportion to the labour spent in expressing it?

As we have to do chiefly with pictures, let us see, in order to clear up matters a little, what the precise steps are through which it goes from first to last. First, then, the artist sees and feels the effect he would convey; secondly, *his fine art* suggests his conception for the canvas; and thirdly, his art or craft enables him to put his conception into actual shape.

I insist on the middle stage. It is, so to speak, the message he has for his fellow creatures; the *art*, or third stage, is merely the ink and paper, and aims at nothing more than the expression of the artist's idea.

Man is not a copying machine like a camera. When he paints a picture he does not copy from nature as a camera does; he paints *his conception* of what he sees, and his conception is necessarily what he himself has felt as well as seen; it is, in short, the sum total of his sensations so far as he can convey them, and the extent to which he can convey them is the extent of his *fine art* faculty, plus his art faculty.

To recapitulate. We recognise *art* when the *tangible* results seem to us far beyond what could have been expected from the simple means, and we recognise *fine art* when the *emotional* results seem to us far beyond what could have been expected from the simple means, the disproportion in both cases indicating the *amount* of art or fine art, as the case may be.

Many people confound the beauty or power of the artist's conception with "fine art." They hold that, according to the artist's intensity of emotion so is he endowed with the faculty of "fine art." This is not my idea. I hold that fine art has nothing whatever to do with the intensity or beauty of the artist's conceptions, but only with their *expression*. Fine art is not called into existence until the artist seeks to express his emotions in some tangible shape or form, and then he shows his "fine art" by the craft, cunning, or skill with which he transfers his emotions to the hearts of others.

In what relation does photography stand to all this?

Beginning modestly, we may first determine if photography is an art or a science. The term art-science is one very frequently applied to photography, but I am convinced that if it be an art in any shape or form it is so only in a very restricted way.

Admit, for argument's sake, that a photograph reproduces with a fidelity far beyond anything that the hand of man could attain to, it must still be allowed that the means used to attain this end are infinitely more complicated than the few hairs tied on a stick which the artist uses. Indeed, it might be argued that if *art* is the apparent disproportion between means and end, photography is not art at all, but science. There is no art on the part of the lens when it produces its images; it does so strictly in accordance with natural laws. The developer acts as thoughtlessly as any other chemical experiment, and these are the chief factors in every photograph. It is true, you have one small part to play—you must have the *art* of exposing properly; but even here a few shillings will purchase for you a machine to do even this. I do not admit art in development. Art in development is only called in when the exposure has been made without art. And as I have already allowed art in exposure, I cannot allow it here again. With such an infinitessimal part of the picture the outcome of art, is it honest to call a photograph a work of art? I think it may be doubted.

I am dealing now with mere photographic productions, independent of subject, which will be considered next; I therefore take no cognisance of the selection of views which comes in under the *fine-art* aspect. Allow me, then, to repeat that at every step in the production of a photograph, the *means* are apparently, and, of course, actually equal to the *ends*, and there is no room for *art* in the strictest sense of the term; that is, of course, according to my definition of the word art. If, then, photography be not an *art*, it can scarcely be a *fine art;* but not to terminate the discussion by this logical quibble, let us consider the subject at greater length.

It is a favourite explanation to say that camera and plates are to the photographer just what the paint and brushes are to the painter, and that, therefore, the photographer is on an equality with the painter. Admitting, for argument sake, that the premises are correct, the conclusion does not follow, for merely the very simplicity of the artist's means, and the end he obtains from them, entitle him to an infinitely higher platform than the photographer. But I hold that the camera and plates are not the equivalents of the brush and colours.

I will admit the parallelism, if you will allow me to say that the camera and plates are the brushes and the colours only when nature herself is the artist. The picture painted by the artist is a transcript of his own emotions, but a photograph is not a reflex of human emotions at all, unless, indeed, accidentally so, but is a direct reproduction of nature, and only through science the offspring of man's genius.

But, it may be argued, does not a photograph awaken emotions just as a picture by any other method does, and is this not enough to stamp it a work of fine art? By no means. I allow that it may awaken emotions, but so also does nature herself, and she is not art or fine art. It does not follow that because a photograph looks like a work of fine art, or gives rise to similar sensations in the mind, that it is a work of fine art. The manufacture of paste gems has got to that stage of perfection that it is difficult even for the expert to tell the true from the false—this does not convert the paste into the real for all that. The same is true of photography. I quite admit that a few photographic giants have turned out work marvellous in itself, and marvellously like the creations of the painter, but after all it is only simulation, and nothing more.

If, then, photographs are not works of fine art, are they all equally bad or good from an art point of view, for this would seem to be the outcome of this argument. By no means, for even denying them the title of fine art in its true essential meaning, it is not to be denied that the general character of a man's photographic work does indicate whether or no he has the feeling of a true artist in him.

When one is face to face with the work of our photographic "dons," the first thought that strikes him is this, that in the author of this or that picture there are the makings of an artist, and that, given the necessary craft with the pencil or brush, works of fine art in every sense of the term would be the outcome. My position, then, is, that photographs may, to some extent, show the art proclivities of the photographer, yet they are themselves not works of *fine art.*

In conclusion a few words may be said on the naturalistic or "out of focus" idea and its relation to the points we have been discussing, what is sought to be obtained by these dodges, and are they generally successful? The idea from the first was to bring the photograph into a closer similitude with the work of the artist. It is a tacit acknowledgment that the artist attains the effects of nature by some other method than slavishly copying nature, for the photograph slavishly (so to speak) copies nature, and photographers would fain improve on this. An exact reproduction of nature, the size of any ordinary picture, would not be effective, in so far as the elaboration of detail *on this small scale* detracts from the general effect. If a picture or design is to be effective as a whole, it must be simple, or, at any rate, the broad, general effect must predominate over the various parts.

Artists call this quality "breadth," and it is to obtain this quality that the "out-of-focus" school suggests the obliteration of a certain amount of detail by putting the picture to some extent out of focus. Now note that even if this dodge were successful (which I deny) it would in no way alter the *fine art* qualifications of a photograph; but, being a purely technical manœuvre, it would, to some extent, introduce *art* or *craft* into its production, that is, if you can dignify the racking in or out of your lens by such a term. But I deny that to put the picture (to the limited extent it is possible) out of focus is to improve its breath, and for this reason, it is not so much a superabundance of detail that destroys the breadth of a photograph as the confused and muddled light and shade.

In order to gain this quality of breadth the artist introduces a scheme of light and shade for the picture *as a whole.* This part is not copied from nature, but is ingeniously devised by the artist to produce the effect of nature on a diminutive scale. The success depends upon the perfection of his *art* or *craft.* This is an entirely different thing from the results brought about by racking the lens out of focus, for, according to my notion, this only makes confusion worse confounded by leaving untouched the muddled light and shade, while at the same time you remove the *raison d'être* of it.

Detail does not *necessarily* destroy breadth, for if it is not unnaturally obtrusive it should be invisible at the correct distance for judging of the breadth of a picture. What we want in photography is the power, not to suppress detail, but to simplify the scheme of light and shade, making the effect of each part subservient to the whole. As the confusion of black and white in a photograph is due, in great part, to the erroneous rendering of colours, it follows that orthochromatic work must possess more "breadth" than the ordinary; at any rate, it must be truer to nature. For all this, I hold, as I have already said, that the broad light and shade introduced into a picture by an artist is a creature of his ingenuity; and, while it is meant to represent nature, it is not copied from nature, for he must fall upon some plan of his own, whereby miles may be represented by inches, and perfect relief by a flat surface. The perfection to which he attains is the measure of his *art* or *craft.* I do not myself see how breadth of effect is to be introduced into our photographic productions save by the stereoscope, which has a wonderful effect in unravelling the tangle; but, since the stereoscope is only of service for small work, which least of all requires breadth, the difficulty remains.

To put a photograph out of focus, and leave it otherwise untouched, I am convinced, is to make bad worse; still, it is an honest endeavour to overcome a recognised failing, and ought not, I think, to be laughed at, but rather to be honestly argued on, and taken or rejected by the result.

J. K. Tulloch, M.B.

THE PHOTOGRAPHIC SOCIETY'S LECTURES.—II.

Mr. H. Chapman Jones on "The Distortion of Outline in Photography."

On Tuesday evening last, January 19, Mr. William England took the chair on the occasion of Mr. Chapman Jones delivering the second of the Society's lectures, the subject being *The Distortion of Outline in Photography.*

After saying that there would always be differences of opinion as to what was true in the pictorial representation of solid objects, Mr. Jones went on to point out that distortion was either due to the lens or the sensitive surface. Distortion by the lens might be due simply to the lens itself or its position, and the same definition applied to the plate. It was sometimes said that distortion was due to the camera, but it could only indirectly be produced thereby. Having fully described the causes of barrel and cushion-shaped distortion, and illustrated the effects of the two kinds of curvilinearity on a series of concentric circles, he mentioned that he had found that, by taking negatives of a rod affixed to a wall, and having a number of marks upon it at equal distances from each other, the crowding or expansion of the divisions at the edge of the plates showed the extent of distortion given by a particular lens. In this case he found that a seven-inch single lens covered a five-inch plate —that is, a quarter-plate—without any measurable distortion. In this

way, one could obtain a permanent record of the distorting effects of any lens.

The lecturer illustrated distortion due to the lens by references to the remarkable effects sometimes produced in portraiture by placing the objective too near the sitter. This kind of distortion was, he said, due to the application of an exaggerated principle. They had all seen pictures in which the feet of a sitting figure were nearly large enough to hide the figure. This was undoubtedly distortion, although the necessities of plane perspective were entirely present. As regards distortion due to the plate, its very flatness led to distortion, as spheres placed towards the edges of the pictures became enlarged. On the other hand, curved plates got rid of this distortion to some extent; but then the spheres on the outer edges became much smaller than those in the centre, and thus the cure was worse than the disease.

Mr. Jones showed that the position of the plate, if it be tipped backwards or forwards, produced false gradation of the scale and elongation of the image, and also pointed out how the use of the swing-back tended to enlarge foreground objects, which was a distortion. Incidentally, he advised the use of a single lens, with the diaphragm placed in front, when photographing from nature, in preference to a rapid rectilinear. If the stop be placed in front of such a lens, the curvilinear distortion produced crowded up part of the image on the plate, while the flatness of the plate tended to lengthen it. He also explained how distortions in a negative could be cured in reproducing the image with the plate or the negative tipped as might be desired from the nature of the distortion, and thought that this utilisation of distortion had never been sufficiently treated of.

A short discussion followed, and at the conclusion Mr. Chapman Jones was heartily thanked.

PRESSURE GAUGES.

[Read before the Manchester Photographic Society.]

There has been considerable discussion the last few weeks regarding the pressure gauges used to indicate the quantity of gas in cylinders, and many questions have been asked as to their safety, although little has been said about the purpose for which they are made—that is, their efficiency and correct registration when in use. I therefore propose to lay before you a brief description of the construction of some of the best gauges, their qualities, and a few remarks on the safety or danger in using them, illustrated by parts in various stages of manufacture, and show the results of carrying tests up to the point of destruction.

The exterior of the ordinary Bourdon type of gauge is well known to all of you, and demands little comment, as we are now more concerned with the interiors. After removing the glass and dial plate, we expose a metal tube shaped like a letter C, the lower end of which is screwed to the boss, which is attached to the cylinder. The boss is bored so as to admit gas direct from the cylinder into the curved tube. (In passing, I may say that steam gauges are constructed on precisely the same principles, but are only adapted for the low pressures common in mills and steamships, which rarely exceed 200 pounds pressure on the square inch in the largest steamships, and a little more than half that in mills.)

The upper end of the C tube, which is closed, is attached to a small lever, which acts on a rack and pinion, causing the movement of the needle on the dial. The general principle of this part of the mechanism is very simple, but the workmanship should be of the finest quality, and in this respect most makers' gauges that I have inspected fail, the loose fittings permitting great inaccuracy.

The action of this form of gauge depends on the fact that, when internal pressure is applied to a curved tube, the tendency is to straighten the tube. If it is thin and flexible, a light pressure is sufficient to make it nearly straight; but, if the tube is made of great rigidity, a very heavy pressure only serves to slightly open the crescent shape. Now, when such a tube as this is filled with a fluid under high pressure, it moves the free end of the bent tube a little, and the rack-work moves the needle a little, increased pressure further expands the crescent, and causes the needle to revolve a greater distance over the dial.

It will be obvious to you that, in order to allow of sufficient expansion, only an elastic material can be used, while, to withstand the enormous pressure of several hundred atmospheres, that material must be of the strongest quality. In saying such plain facts are obvious, I credit you with much greater intelligence than some makers have displayed in the construction of the instruments they have put before the public. I am not going to mention the names of such people, but will show you their work, when you will not be surprised at so-called accidents.

Here is a gauge tube which the workman found to be too rigid to register properly over a sufficient range—probably the substance or texture of the metal is unsuitable for this class of work; I think a sound, honest workman would have rejected it, but this gentleman, whoever he was, took a file and reduced the wall of the tube sufficiently to yield to the required pressure, regardless of the fact that it has weakened the structure, and that he had carefully arranged for what might some day be called an accident. A tube that requires filing should be remorselessly put aside.

Here is another gauge, made for steam pressure, but in this instance the tube is too soft or inelastic, and when expanded it becomes "set," and refused to return to its original shape—that is always a bad sign; the maker in this case, instead of substituting a better tube, has attached a spring to pull the tube back to its original position. This, no doubt, will give a reasonable result for a time on the dial, but it indicates a tube too weak for the pressure it is intended for, and is bad in design, for the necessary resistance should have been obtained by strengthening the tube itself; the life of such a pliable tube depends upon its flexibility only, irrespective of any elastic temper it may possess.

I recently saw a gauge tested that was made by a manufacturer of some repute; the dial was marked up to 300 atmospheres, and, after submitting it to that pressure for five minutes, it only returned to twenty-five atmospheres instead of to zero, showing a "set," and that it had been tested to a point approaching its limit of endurance. Now, what constitutes a sound manufacture, and a reliable form and quality in this vital part of the gauge? The best reply I can give is to describe the process of making these tubes, as carried out by the largest European manufacturers, Messrs. Schaeffer & Budenberg, of this city, who courteously explained their methods to me, and have enabled me to bring tubes in all stages, so that you may see the whole thing, from beginning to end.

First, then, is the material, which for gas is of the finest special selected homogeneous steel. The ordinary Bourdon tube is made of brass alloy. Few makers use steel, but I would only use a brass tube for low pressure, where its strength is relatively great. I consider such gauges are of little practical utility to lanternists, on account of their limited range.

Having obtained a bar of octagonal pressed steel of the requisite length, it is drilled longitudinally, and for a four-inch gauge the bore is about a quarter of an inch in diameter. Every tube is carefully polished inside, and rejected if any scratches or tool marks are visible. Then, if perfect, the outside is turned down, leaving a flange at each end, which is threaded with a screw for coupling to the terminals. By this method the thickness of the wall of the tube is equal throughout, and of equal strength.

Some gauge tubes I have seen are made of drawn tube, soldered to the flange. Here is a dangerous factor to begin with, for the structure of the metal is strained in the drawing, and the thickness is unequal. No doubt the motive is cheapness, with a reliance on the general ignorance of the public; further, a steel which permits of drawing is necessarily of unsuitable quality for this purpose, for the best metal does not permit of drawing at all.

In the tube I am describing the method not only produces equality in thickness, but it places no strain or torsion on the metal beyond the light pressure of the cutting tool, which may be left out of consideration, and it necessitates no heating in that process. The tube is then flattened, so that the section becomes elliptical instead of circular, thereby improving the range of movement, and permitting the employment of a thicker and stronger tube.

The tube is next filled with sand, heated moderately, and bent with the least possible tension into the crescent shape now shown to you; it is very important that the bending should be regular, avoiding angles. After careful tempering it is tested to a very high pressure far beyond the scale shown on the dial. This maker's gas gauges will bear a pressure of 800 to 900 atmos., although cylinders are only filled to 120 to 130 atmos. To satisfy me on this important matter, an ordinary four-inch gauge tube was taken from their stock, which I now show you, and, after repeated tests up to five tons on the square inch, it was decided to burst it in my presence, and I carefully made the following measurements:—

Upon testing to three tons, the gauge expanded $\frac{1}{64}$ of an inch, and, upon removing the pressure, it returned to its original shape. It was tried at four tons, it expanded $\frac{1}{32}$ of an inch, and returned to zero without any sign of set; then a five-ton pressure expanded it to $\frac{1}{16}$ of an inch, and it once more returned to zero without any set, when the pressure was withdrawn. At six tons' pressure it opened $\frac{1}{8}$ of an inch; but, when the pressure was released, it was found to have a set of $\frac{1}{64}$ of an inch. The last trial was to carry on the pressure to the bursting point, which was only arrived at when the pumps registered

7 tons 16 cwts. = 1164½ atmospheres, or, 17,472 lbs. Such a test manifests the immense superiority of well-made steel tubes over the ordinary Bourdon brass alloy gauges, and should satisfy any user.

The testing was hydraulic, and performed slowly. It is a very different thing to suddenly apply a force which acts like a blow of a hammer. If a cylinder valve is opened slowly, the pressure in the gauge is gradually increased; but some persons carelessly open the valve fully and suddenly, and occasionally the gland is screwed so tight that it is impossible to open it gently. In such cases the inrush is said to be equal to about double the pressure when it is applied gently. Now, the ordinary pressure of a full gas cylinder is 120 to 125 atmos., and the best gauges, such as the one possessed by this Society, will register up to 250 atmos. If the gas is turned on at full pressure suddenly without any check valve, it is possible the needle would pass beyond the range of the dial. There would not, however, be any danger of bursting, or even of giving a set to a well-made steel tube such as I have described. It is difficult to get gas into a gauge quick enough to show such extra pressure, and several trials were made with a gauge, from which the check had been taken out, attached to a hundred-foot cylinder containing common air compressed to one hundred atmos. The valve was opened as quickly as possible, but I could not detect any advance of the needle beyond one hundred atmos.

The cause of bursting must be sought either in a thin or badly made tube, such as I now show you, which was burst by a user several months ago, or else it must be found in the introduction of some explosive compound; and it is to the latter I now ask your attention.

Without going deeply into that form of force known as heat, I will remind you that all matter familiar to us contains an amount of it, and if you take, say, ten cubic inches of matter, and suddenly compressed it into five cubic inches, all the heat of the ten cubic inches would remain for a time in the smaller space, and the temperature would be proportionately raised. On the other hand, if you expanded the ten cubic inches into twenty, the temperature would be proportionately reduced, and remain lower until external heat was absorbed. Any of you may prove this latter fact any evening when our lantern is in use, when you will find that, as the gas is consumed and the contents of the cylinder are allowed to expand, the temperature of the cylinder is perceptibly lowered, and it feels cold to the hand even in a warm room. To show the increase of temperature following sudden compressing, I propose to show you an experiment with this small piece of apparatus, kindly lent by Professor Core, of Owens College. It is a tube and piston, something like a child's popgun. If the piston is pressed in slowly, the compressed heat escapes into the tube, but, if it is quickly driven home, there is not time enough for the heat to escape, and the temperature of the compressed air is raised high enough to ignite a small piece of tinder.

Something similar to this occurs when the gas is let into a gauge quickly from a cylinder, for the air already in the gauge tube is suddenly squeezed into one hundred and twentieth part of its normal volume.

Pressure gauges certainly are not furnished with tinder, but if there is anything else in a gauge that easily fires, such as oil, left from improper testing operations, or carried into it from a cylinder valve, it becomes greatly heated, and only requires the introduction of the oxygen to ignite it. Further, if the gauge is employed for both oxygen and coal gas, and there is a residue of one of these in the tube when it is used for the other, we have at once a most explosive compound, at a considerable heat, containing carbonaceous matter, all ready to ignite at a comparatively low temperature, and burn with the greatest rapidity; hence an explosion.

All this became apparent to Mr. W. Morton Jackson, the Manager of the Manchester Oxygen Company, when he directed his attention to it, and I have seen the results of his plucky and somewhat dangerous experiment when investigating the matter. That gentleman devised what I think is a perfect safeguard against the folly of the careless or misfortune of the ill-informed lanternist. And one of the most remarkable points in connexion with the explosion at one of the leading London Photographic Societies a few weeks ago is that such a Society should either be ignorant of, or be content to remain without, an efficient check valve in the gauge used.

In the published account of this explosion it is noticeable that the gauge is particularly singled out for condemnation, although it was not apparently the cause of the incident any more than was the ceiling of the room, both of which were damaged by the explosion. No mention is made of any check valve in the gauge, and it is reasonable to suppose that with one the gauge would have been saved, although the ceiling might still have been damaged by the fractured regulator; for the cause was, doubtless, the combustion of the oil, traces of which were afterwards found in the cylinder valve, whereby some of the metal was fused, and the regulator, whose maker and form are not stated, was destroyed. There was no trace of fire discovered in the gauge at all, it being burst by the violence of the explosion, which also shattered the regulator. It appears to me the explosion did not originate in the gauge, but between it and the cylinder valves, for the necessary heat must have been obtained by the sudden compression of the air outside the cylinder, and not from the oxygen in it, and that the portion of the air that was compressed within the gauge would be heated at its extreme end at the greatest distance from the oily cylinder valve, which extreme end showed no trace of fire; but the portion of air that was compressed between the cylinder valve and the regulator was in the presence of the oily matter, and it was there, I think, that the ignition and fusion were originated.

The lesson to be learnt seems to be the need of great care to use strictly clean apparatus.

The air in the tube between the cylinder valve and the bellows of a duplex regulator appears to be driven into the bellows when the gas is turned on, thus relieving the tube and preventing the accumulation of heat. A similar action may take place with other regulators.

There is no great novelty in the adaptation of check valves to pressure gauges, for they have been supplied by Messrs. Schaeffer & Budenberg for many years; not, however, to guard against the bursting of the tubes, but to prevent the undue wear of the rack work from careless usage in connexion with hydraulic pumps. It was found that the men in some of the packing-houses would overstrain their hydraulic presses; and then, fearing some damage, would let down the pressure suddenly, this tended to wear the rack work and spoil the gauge; therefore a check was introduced which only permitted the escape of the water from the gauge at a diminished rate; but this check is not suitable for gas.

The Jackson Check Valve for compressed gas is simple, and all the better for it, as it is not likely to get out of order, and there is nothing about it to choke the gauge, such as pumice, as mentioned in The British Journal of Photography lately.

The stem of the gauge which is attached to the cylinder has a thread tapped into its bore, into which is screwed a brass plug about a quarter of an inch long, this plug has a hole drilled through it about one-twenty-fifth of an inch in diameter. The exact size is not important. Upon the end of the plug, and filling the stem of the gauge laterally, is placed a piece of felt; on this is placed a little disc of fine wire gauze, then another felt and disc, until altogether there are five thicknesses of felt, separated by four discs of metal gauze. These are all squeezed together by another screw plug similar to the plug first inserted, the result being that, although gas at a low pressure can easily, although slowly, pass into the gauge, high-pressure gas can only enter at about the same slow speed, the heat due to compression has more than abundance of time to escape, and all chance of high temperature, and consequent explosion, is prevented.

This check, so simple and so perfect, can be had at a trifling addition to the cost of the gauge, and no sane person should be without it. I have used my own gauge thus protected without the slightest compunction for both oxygen and coal gases, one immediately after the other, and have never seen either a quick inrush or exit of the gas indicated on the dial.

In The British Journal of Photography of January 8, a safety device is mentioned, made by Mr. Beard, the entrance to the gauge being closed by a screw having a slight passage in the threads, which would prevent any sudden pressure. The brief description is by no means explicit, but it seems to imply the necessity for turning the screw to admit the gas to the gauge after attaching it to the cylinder. If that is so, I think such a device is distinctly inferior to the Jackson Check, inasmuch as with the latter no separate act of the operator is required; and, further, with a single thoroughfare, great care would be needed both to see that it was in order or closed, to begin with, and then to turn it slowly to gradually admit the gas. A reliable check should be always ready for use without special attention, and it should be equally safe and effective in the hands of the careless as well as the cautious operator.

A check valve containing pumice, or any friable substance, should be avoided, for it would be very likely to become imperfect in action by choking the inlet under the high pressure behind it.

H. M. Whitefield.

(To be concluded.)

Messrs. S. & G. de Saulles & Co.'s new trade list contains particulars and prices of the various kinds of glass employed for photographic and microscopic purposes. The firm do not supply amateurs.

RECENT PATENTS.

PATENTS COMPLETED.

MEANS FOR ENLARGING PHOTOGRAPHIC GELATINE FILMS BY THE AID OF CHEMICAL MEANS AND WITHOUT THE AID OF AN ENLARGING APPARATUS.

No. 16,125. ALBERT JOHN EVES HILL, 4, Clifton-villas, Clifton-road, Norbiton, Surrey.—*December* 19, 1891.

THE object of my invention is to provide means whereby photographic gelatine films can be enlarged without the use of enlarging apparatus. I effect this by subjecting the film to the action of a solution in water of citric acid (or other acid of the like nature), glacial acetic acid, hydrofluoric acid, and glycerine.

I assume the film to be operated upon to be mounted upon glass, as is customary. After the photographic picture has been taken, developed, and fixed, it should be well washed to cleanse it from the developing and fixing agents employed.

If ammonia has been used in developing, it is advisable to neutralise it, and this may be effected by immersing the film in a bath of acetate of soda (of, say, one drachm to each ounce of water) for a time, in accordance with the thickness of the gelatine film. If, however, the developer has been a fixed alkali in combination with such agents as pyrogallol, hydroquinone, eikonogen, or ferrous oxalate, this treatment with a neutralising agent is not needed.

The plate or support carrying the film is then (after draining, if the neutralising solution has been used) immersed in the enlarging solution, and, after a time, the film will separate from the plate or support. It is then carefully transferred to water, which may best be done by lifting it out of the solution upon the plate or support which it has just left, and introducing the plate and film into a shallow dish or tray containing water. It should be allowed to remain for a time in this water bath. Usually about fifteen minutes will be sufficient.

The final support of the required size for the enlarged film is then introduced under the film, and the film is lifted out of the water supported upon this final support, which may be opal, glass, paper, canvas, leather, or any other suitable material. The film should then be blown upon to remove liquid and air from between the film and support, and the support and film should then be placed on a level surface, and be allowed to dry slowly at not too high a temperature, the ordinary temperature of the air usually answering best. Should the enlargement not be sufficient, the film may, after drying, be again subjected to the treatment described.

When the film has been dried, and, say, after about twenty-four hours, it should be washed in water, and can then be treated as an ordinary film by being, for instance, retouched, intensified, or toned.

The proportions of ingredients for the enlarging bath which I have found to answer best in practice are—

Hydrofluoric acid	1 part by weight.
Citric acid	4 parts ,,
Glacial acetic acid	1 part ,,
Glycerine	1 ,, ,,
Water	32 parts ,,

Other vegetable acids of the same nature as citric acid may be used, such as oxalic acid, tartaric acid, and the like, but I prefer citric acid.

The hydrofluoric acid acts as a detacher for the film, whilst the citric acid and the glacial acetic acid are the active enlarging agents. I use the two together because glacial acetic acid alone is apt to give objectionable curling or waving of the film, whilst citric acid is not strong enough alone to give such a considerable enlargement as is usually desirable. The glycerine is used simply as a vehicle and preservative. Methylated spirit or other preservative usually employed in photography would, therefore, be an equivalent for the glycerine in the solution.

To prevent the acids from attacking the silver in the film, so as to cause loss of intensity in the picture, I may add to the solution a sulphate of iron or copper, or both. I prefer to use in the solution with the hereinbefore given proportions, four parts by weight of sulphate of iron and one-fifteenth part by weight of sulphate of copper.

The proportions of the ingredients may be varied from those hereinbefore given, it being preferred to make the solution somewhat weaker when the operations are to be carried on in a higher temperature than ordinary, and stronger when the temperature is lower.

Although, for simplicity, I prefer to include the hydrofluoric acid in the bath with the enlarging agents, yet the film may be first put into a solution of hydrofluoric acid, and then, without washing, be subjected to the action of the citric acid and glacial acetic acid solution.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—1. For enlarging photographic gelatine films, the use of hydrofluoric acid, citric acid (or acid of a like nature), and glacial acetic acid, substantially as hereinbefore described. 2. A bath for enlarging photographic films, the said bath being composed of hydrofluoric acid, citric acid, or acid of a like nature, glacial acetic acid, glycerine (or equivalent vehicle or preservative), and water, with or without the addition of an agent for preventing loss of density, substantially as hereinbefore described. 3. A solution for enlarging photographic gelatine films, the said solution being composed of hydrofluoric acid, citric acid, or acid of a like nature, glacial acetic acid, glycerine, and water, in or about the proportions hereinbefore stated, with or without the ingredients for preventing loss of density.

IMPROVEMENTS IN THE CARBON PROCESS OF PHOTOGRAPHIC PRINTING.

No. 18,827. MAX RAPHAEL, Breslau, Prussia.—*December* 19, 1891.

THE object of this invention is to produce carbon-print pictures by a different method than that heretofore adopted—that is to say, without the employment of the customary carbon papers, transfer papers, and compression process, and from a negative directly upon a mica plate prepared with carbon emulsion.

The process heretofore followed in the preparation of carbon pictures is only practised if the picture which was originally taken upon carbon paper, and afterwards sensitised with bichromate of potassium, was subsequently transferred to single or double transfer paper, and from this on to glass or other material. However, in order to effect the transfer, other manipulations have heretofore been necessary.

How much trouble and waste of time have been incurred by the process heretofore followed will be best ascertained by perusal of works of different authors bearing upon the subject.

One of the chief objections to the process heretofore practised is that the picture is produced in a reversed condition after exposure, and the correct picture only obtained by transferring.

By my invention I propose to simplify the above process by pouring the carbon emulsion direct on the mica plate, allowing the same to dry, and afterwards rendering the same sensitive by means of bichromate of potassium, so that on exposure to light the picture upon the negative is seen in its proper aspect.

This is obtained by printing the mica plate reversed—that is to say, the printing is not produced, as heretofore, by placing the sensitised surfaces in contact with each other, but by placing the rear side of the mica plate, or the unprepared surface, upon the face of the negative. An exposure of this description is only possible because the thickness of the mica plate is considerably less than that of glass.

The direct copying of a negative upon a carbonised glass plate is not possible on account of the thickness of the plate, and has not been attempted heretofore, as only imperfect pictures would have resulted.

According to my invention, the entire process of carbon printing will resolve itself into:—

1. The sensitising of the emulsion on mica plates by a bath of bichromate of potash.
2. Placing the sensitised mica plate, with its unprepared surface, upon the prepared surface of the negative when copying.
3. The exposure to light.
4. The development of the picture.
5. The fixing of the picture by alum.

By my process many of the usual operations may be dispensed with.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—The process for the production of carbon prints, consisting in treating mica plates with carbon emulsion, and thereby dispensing with the use of the carbon papers, which have heretofore been necessary, and also with the squeezing operation, substantially as hereinbefore described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
January 25	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 25	Gloucestershire	
,, 25	Lantern Society	20, Hanover-square.
,, 25	North Middlesex	Jubilee Hall, Hornsey-road.
,, 26	Rossendale	Townsend-chambers, Rawtenstall.
,, 26	Brighton	Arch 40A, King's-road, Brighton.
,, 26	Great Britain (Technical)	50, Great Russell-st., Bloomsbury.
,, 26	Lancaster	Storey Institute, Lancaster.
,, 26	Leith Amateur (Annual)	
,, 26	Warrington (Annual)	Museum, Bold-street, Warrington.
,, 27	Bath	Roy. Lit. & Sc. Inst., Terrace-walks.
,, 27	Barnsley	Bank Chambers, Hargreaves-street.
,, 27	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 28	Birmingham	Lecture Room, Midland Institute.
,, 28	Camera Club	Charing-cross-road, W.C.
,, 28	Hackney	Morley Hall, Triangle, Hackney.
,, 28	Halifax	Mechanics' Hall, Halifax.
,, 28	Hull	Royal Institution, Hull.
,, 28	Ireland	Rooms, 13, Dawson-street, Dublin.
,, 28	Liverpool Amateur	Crescent Chambers, 3, Lord-street.
,, 28	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 28	Oldham	Lyceum, Union-street, Oldham.
,, 29	Cardiff	
,, 29	Holborn	
,, 29	Maidstone	"The Palace," Maidstone.
,, 29	Richmond	Greyhound Hotel, Richmond.
,, 29	Swansea	Temby Hotel, Swansea.
,, 30	Putney	High-street, Putney.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 14,—Mr. A. L. Henderson in the chair.

Before commencing the business of the evening the CHAIRMAN uttered an expression of sympathy with the Royal Family in their recent bereavement. The Duke of Clarence, he believed, was an amateur photographer.

Mr. J. TRAILL TAYLOR thought sympathy should also be extended to the Duke of Teck, who took great interest in photographic matters. Not many months ago he (Mr. Taylor) was present at a gathering having for object the establishment of a British Museum of Photographic Portraits. On that occasion the Duke of Teck presided.

The members present concurred in the Chairman's expressions.

Mr. R. P. DRAGE (the Hon. Secretary) read a letter from Captain Mantell, the Hon. Secretary of the Photographic Society of Great Britain, acknowledging, with pleasure, the receipt of the Association's resolution of support in reference to the action of the Photographic Society of Great Britain in connexion with the late Exhibition.

Mr. J. WERN BROWN said: "Allow me to reply to the question put by Mr. Haddon in my absence three weeks ago as to the grounds upon which I claimed permanency for the toned bromide prints from which the silver had been removed for the production of the chalk-red tones. The question was, no doubt, put under a misapprehension of what I wished to convey to the meeting. I

did not claim permanency for the image as formed according to the latest addition to the toning process, either in the sense taken up by Mr. Haddon or in any other. The solubility of the colour deposit to which he refers has never been in question. My remarks were intended to refer to the known tendency of uranium-intensified negatives to go on increasing in density. A member of the Photographic Club, on the previous evening, had put forward a theory of the probable chemical reactions involved in the toning process, and expressed an opinion that the toned image from which the silver had been removed would be permanent, in the sense that it would not be subject to the same tendency to intensification in course of time as one in which the silver was retained. It was my intention only to convey that opinion to the Association. As regards the difficulty with the hypo suggested by Mr. Haddon, it will be remembered that I recommended for these chalk-red tones that both development and toning should be carried further than would be necessary in ordinary circumstances. This leaves a convenient margin of allowance, and permits of the removal of the hypo without too great reduction. In practice, the print, after removal of the silver, is rinsed for a couple of minutes, immersed for five minutes in the peroxide of hydrogen bath, and again washed for five minutes. Further reduction, if it be required either generally or locally, can be obtained by the use of a very dilute alkali."

Mr. A. HADDON said that when making the remarks referred to he could not understand how the prints, which had only been produced a week or a fortnight, could claim to be permanent. It was only by the test of time they could make sure whether they were permanent or not. With regard to the toning of gelatino-bromide prints by uranium nitrate and potassium ferridcyanide, they noticed that as soon as the image began to tone there was a brown deposit in the solution. This was, undoubtedly, ferrocyanide of uranium, but its place was not in the solution as a precipitate, but in the paper or gelatine. It was due to this waste of uranium that they had to print much beyond what was required to allow for the solubility of the precipitate in washing. He thought they should considerably diminish the quantity of ferridcyanide and increase the quantity of uranium. The reason why there was a red precipitate formed in the solution was because the ferrocyanide of potassium formed finds nothing in the solution to combine with. By diminishing the ferricyanide and increasing the uranium there would be sufficient nitrate of uranium left for the ferridcyanide to combine with. When toning had gone as far as was required, it was necessary to wash the whole of the acetic acid away before fixing. There was a loss of density caused by the alkalinity of ordinary water, which would dissolve uranium ferrocyanide and ultimately cause the image to disappear. Thus it was necessary to allow a sufficient amount of over-printing. But it was possible to remove silver which had been modified into ferrocyanide or chloride by substituting for Farmer's reducer a solution of potassium ferridcyanide and ammonium sulphocyanide. If this were used there would be no necessity for a prolonged washing, and the silver eliminator could be kept acid. If acetic acid in combination with the ferridcyanide and sulphocyanide were used for removing the silver, they would experience no loss of image due to alkali, and the picture would be completed by a rinse in water. This solution would reduce ordinary negatives or bromide prints.

Mr. WEIR BROWN said Mr. Haddon's information was the first practical outcome of his publication of the process. The remarks only applied to its latest development. With the first process the amount of washing required was slight indeed. The suggestion to employ acidulated water for the wash water of the first process was a good one. There would then be no loss of image however prolonged the washing might be.

Mr. HADDON recommended as a suitable uranium toning bath a one per cent. solution of nitrate of uranium in two ounces of water, to which a drachm of acetic acid and two grains of potassium ferridcyanide were added.

Mr. J. S. TEAPE drew attention to a recent great reduction in the price of platinum.

The Chairman exhibited a stereoscopic shutter, the principle of which was that the exposures were made by two revolving metal discs, the apertures of which opened and closed in the centre.

After some further general discussion the meeting adjourned.

Camera Club.—January 14.—Mr. J. Howson read a paper entitled *The Pro and Cons of Chloride Printing.* Captain Abney occupied the chair. Mr. HOWSON argued in favour of the permanence, beauty, and simplicity of working of gelatino-chloride prints, and contended for the special applicability of each printing process to its particular purposes. The lecture was illustrated by a collection of examples, some matt and some highly glazed in surface, the prints also showing the variety of colour attainable. On January 28 a series of lantern slides will be shown, described by Lieut.-Colonel Gale, after which other slides by members will be exhibited.

North London Photographic Society.—January 19, Mr. E. R. Groundwater in the chair.—The *Journal of the Photographic Society of Great Britain* was laid upon the table. A number of packets of bromide paper sent by the Eastman Company for distribution were issued to the members for experiment. Mr. EDGAR CLIFTON then spoke on *The Dark Room*, referring to his own experience with various dark rooms, from the traditional cupboard under the stairs to a distinct room in the house, the various fittings in which were fully described. The window was covered by a frame on which American cloth was strained, and working on a hinge, so that white light might be admitted at any time. The other arrangements were as usual, except that the waste had to be received by a pail, the risk of overflow being met by limiting the water supply accordingly. The need of ventilation was strongly insisted on, and various modes were suggested, the one preferred being by means of the lamp from which light is obtained. Sinks were discussed, and lead-lined ones strongly recommended, failing which, an ordinary washing-tray would be a good substitute, as mentioned by Mr. Cowan. An ingenious plate-washer, consisting of a series of perforated trays, was described. A great advantage in washing plates was to tie a piece of thick felt over the nozzle of the supply tap, as thereby much grit was prevented from reaching the films. A mode of improvising a dark room when travelling was next suggested. Carrying a sheet of waterproof cloth among one's luggage, with a portable lamp, a jug, and two pails, which could always be obtained in one's temporary abode, any plates might be developed in comfort at an ordinary table in the evening. Permanent dark rooms should be coloured orange crome, the light reflected from the walls and ceiling being thus made safe in case of any risk of light leakage. A word of advice followed to keep the hypo dish where it can be conveniently found, but out of the way of everything else—under the sink, on a shelf, being a good place. For dishes, Mr. CLIFTON preferred ebonite, and would always use an automatic rocker when possible. The draining rack being touched open, a sketch was given of a useful form. Outdoor dark rooms were described with illustrations (the black-board being freely used) showing modes of construction, arrangement, and ventilation, and also provision for daylight enlarging. On the question of lighting, one thickness of yellow glass and two thicknesses of yellow fabric were spoken of as giving a safe light under most conditions, artificial light being best, as being of constant power as compared with the variations of daylight. For isochromatic plates a piece of red fabric should be added, and in all cases the light, if possible, should be screened from the eyes.

Holborn Camera Club.—January 15, Mr. A. J. Golding in the chair.—Mr. JOHN HOWSON gave a lecture on *Isochromatic Photography.* [This will appear in a future number].

Lantern Society.—January 11.—Captain GLADSTONE, R.N., read a paper entitled *Westminster Abbey*, illustrated by forty slides, entirely his own work. He began by describing, with the aid of a map, the position of the Abbey and of the various ecclesiastical buildings which in former times surrounded it, pointing out, at the same time, the modern names of the old sites, which in many instances had reference to buildings which have long since disappeared. He next showed a plan of the Abbey, in which the age of each part could be distinguished by the character of the shading. The slides of the exterior and interior were next shown, the lecturer pointing out in each case all that was of historical, architectural, and archæological interest. It will be needless to dwell upon the excellency of the pictures, as every one who knows anything of Captain Gladstone's work is aware of its uniform technical finish and artistic merit. But one of the special features of the lecture was Captain Gladstone's intimate acquaintance with the details of ecclesiastical architecture, which enabled him to trace every variety of style in the ancient and complex structure of the Abbey. Thus he showed in one of the slides that within the space of two feet there could be seen examples of three successive styles of architecture, executed by three different kings—viz., Henry III., Henry V., and Henry VII. And to this he added an almost equally full knowledge of all the history and archæology connected with the building. One amusing fact he noted by the way was that the familiar phrase of "Robbing Peter to pay Paul" had its origin not in the history of the great apostles, but in the story of our two great City churches—St. Peter's Abbey at Westminster having been shorn of much of its revennes to swell those of St. Paul. It is also interesting and instructive to note that the only tomb in Westminster destroyed by the Puritans was that of the only Puritan king, Edward VI.

Putney Photographic Society.—January 13, Dr. W. J. Shepperd in the chair.—The series of lectures on *Photography* in connexion with this Society was ably opened by Mr. W. D. Welford with a paper on *The Camera and its Parts.* Whilst reminding his audience of the natural difficulty of the subject, Mr. WELFORD carefully traced the camera from its early simplicity to its present high-class perfection, pointing out the uses, and in many cases the abuses, of its various parts, and the recent improvements, notably in the matter of dark slides, and the reduction in weight of every part by the use of careful workmanship, light woods, and aluminium. As a general rule, he could not recommend the use of the delicate instruments now so much to the fore, his inclination being towards the medium-priced, but stronger and plainer apparatus. Mr. Samuel, representing Mr. Hudson, was in attendance, and, by means of his new "Kohn" magnesium lamps, a successful group of the meeting was obtained. The second lecture—*Hand Cameras*—on the 30th inst., will be by Mr. A. R. Dresser.

Birkenhead Photographic Association.—January 14.—Mr. George E. Thompson, on leaving the chair in favour of Mr. G. A. Carruthers (the new President), was accorded a hearty vote of thanks for the way in which he had piloted the Society through the past year. Mr. J. A. FORREST then proceeded to discuss the new "Rodinal" developer, and showed some excellent negatives he had produced with its aid. Mr. F. Hope-Jones exhibited the Incandescent Gas Light Company's new aero-carbon light, which has been spoken of as a possible rival of the limelight. Judging, however, from the results obtained, there does not appear to be any immediate prospect of this. The greater part of the evening was most enjoyably spent with Mr. A. W. BEER in his delightful *Camera Wanderings*, 1890. The quality of Mr. Beer's slides is excellent, and much surprise was expressed at the large amount of artistic work which this photographer turns out in a single year.

Birmingham Photographic Society.—January 14, Mr. W. J Harrison in the chair.—The SECRETARY read extracts from the circular received from Mr. Andrew Pringle, asking for the favourable consideration of the members for the fund for Dr. R. L. Maddox. The claim of Dr. Maddox on dry-plate workers was gracefully urged by the President. An important demonstration and paper was then given by Mr. GEORGE BANKART on *Carbon Printing.* [This will appear in a future number]. The dry workmanlike skill and results of Mr. Bankart were much appreciated by some thirty-six members, and a most cordial vote of thanks was given him. The PRESIDENT suggested a joint excursion in the summer months with the Leicester Society, and Mr. BANKART assured the members that his Society would welcome the idea.

Derby Photographic Society.—January 12.—Mr. Keene presided.—Mr. G. BANKART gave a demonstration of carbon printing. The SECRETARY then read the annual report and balance-sheet for 1891, which showed the Society to be in a very flourishing condition, Six new members were elected.

Leicester and Leicestershire Photographic Society.—January 13, Mr Pierpoint in the chair.—The Treasurer (Mr. Wilson) presented his report showing a balance in favour of the Society. Mr. Pierpoint was elected President for the ensuing year. Mr. Porritt was elected Vice-President.

Manchester Photographic Society.—January 14, Mr. Abel Heywood, jun., in the chair.—Mr. W. Thomson, F.C.S., showed a very simple, yet ingenious, device for producing the flashlight. This consisted of one or more tobacco-pipes (common clays), with a ring of asbestos fibre encircling the bowls, the stems being connected by rubber tubing to a mouthpiece. The magnesium powder is placed in the bowls, the asbestos saturated with methylated spirit, and lighted. A sharp puff through the tubing blows the powder through the spirit flame, which completely consumes it, and produces a very brilliant flash. The pipes may be either held in the hand or fixed in suitable stands as required. Cotton wick or cotton waste can be used in place of the asbestos, but, of course, are not so durable. The flash produced was considered highly satisfactory, and the arrangement for producing it was much admired from its simplicity. Mr. Brothers showed a focussing screen which he had used for the "parallactic" method of focussing, similar to the description in the JOURNAL of the 8th inst., but in place of troublesome cross wires, fine pencil lines, diagonally and in squares made on the ground-glass, being used. The glass is made transparent at suitable points by affixing thereto small micro cover glasses with Canada balsam. The eyepiece is first focussed on the ground surface, and is then ready for focussing the image at the transparent spots. The PRESIDENT read a short paper on *Gas Cylinders*, in which he described the precautions taken to ensure safety in their use. These are many, and, as far as Manchester supply was concerned, he felt sure the risk was very slight; but still there was the chance that, in the hands of unscrupulous workmen or dealers, these precautions might be neglected, and he thought that, as the lives of so many depended on the proper observance of the regulations for the safe use of highly compressed gases, it would be wise to petition Parliament to make the observance of such precautions obligatory on all handling these danger-charged reservoirs, and on every one also who sells them. It was decided that a suggestion of Mr. Heywood's, *re* legislation on the subject, should be remitted to the Council for consideration and, if necessary, action. Mr. WHITEFIELD contributed a paper on *Gauge Explosions* [see page 57]. Mr. WHITEFIELD acknowledged his indebtedness to Mr. Badenberg (Messrs. Schaeffer & Budenberg) for much information and a number of specimens of gauges in all stages of construction, as well as a number of defective ones, that had been collected by the firm. Mr. BUDENBERG was present, and spoke highly of the paper. He considered that if the gauges were fitted with a check-valve, and constructed of proper and sound materials, accidents would be unknown. He stated that gauges had been constructed to test up to thirty tons per square inch, so that the ordinary compressed gas was nothing out of the way as regards pressure gauging. Mr. MORTON JACKSON considered that accidents have been caused by the *sudden* pressure igniting some carbonaceous matter in the gauge or connexions, and all, or nearly all, had happened in oxygen cylinders. He stated that the presence of oil in compressed oxygen would not cause ignition or explosion without a greater heat than that of the atmosphere (that was proved), and that he did not see any reason for any explosion if the oil was in the presence of a mixture of oxygen and coal gas, but in that latter condition he was not aware of any experiments having been made.

Oxford Photographic Society.—January 5, Mr. E. A. Ryman-Hall in the chair.—Mr. C. C. COLE read a short paper on *Exposure and Development of Plates*. This Society has now been affiliated to the Photographic Society of Great Britain.

Edinburgh Photographic Society.—January 13.—In accordance with previous notice, Dr. DRINKWATER proposed that it was expedient at once to make an attempt to secure suitable premises for the Society, which could be used as club-rooms, &c., and authorise the Council to make the necessary preliminary inquiries and report at next meeting of the Society. In urging the adoption of this motion the Doctor stated that, while they had abundance of members, the Society was suffering from a want of active life, a thing his proposal would go far to remedy. He further pointed out that the Photographic Convention would hold its annual meetings in this city in the summer of this year, 1892, and he wished that body, while here, to have a good opinion of Scottish hospitality, and to show that the Edinburgh Society was a power in the photographic world. Being at present without rooms of their own, such as club, meeting, and dark rooms, with all the necessary photographic conveniences, this was at present impossible. Mr. AYTON seconded the motion, which, after full consideration of the difficulties in the way, was ultimately agreed upon.

Edinburgh University Photographic Society.—January 11.—DR. J. R. PATERSON took the leading part in a very wide reaching and discursive series of remarks descriptive of photographic processes and apparatus. The latter division of the subject embraced the most recent forms of cameras, lenses, stands, slides, shutters, trays, washer, printing frames, and the other paraphernalia of practical photographic work, which were each introduced and explained by the Doctor; and, as evidenced by the questions and short discussions to which they gave rise, showed that the valuable suggestions and hints were fully appreciated by the members. The best method of washing for negatives and positives was fully entered into, the through current and intermittent or alternating method being fully discussed, the latter, as being at once the most perfect and the least wasteful of water, being considered as the quickest and best. At the end of the discourse and discussion, Mr. F. D. Todd was asked to explain his new flash lamp—the Todd-Forret—which he proceeded to do, showing, first, examples of the work done by its agency, which included single full-plate heads, groups of the *genre* class of from two to six or seven figures, which were much admired. The lamp Mr. Todd described as consisting of three parts: 1st, a chamber for the magnesium powder large enough to hold at least one ounce of the material; 2nd, the lamp proper, which rested on the cork, closing the powder reservoir, and communicating with the latter by a metal tube; 3rd, an indiarubber bellows, similar to that used for spray producing, but larger and stronger, being of sufficient capacity to secure a blast of a quarter of a minute if necessary. The duration of the current is regulated by means of a spring clip, which compresses the delivery tube of the bellows at the will of the operator. In working it, the chamber is filled with magnesium powder, and the associated tank filled with methylated spirits of wine, the bellows or bladder with atmospheric air. On opening the clip and pressing the bellows, the air is forced through the powder, carrying the latter with it. At the exit the discharging tube assumes the shape of a thin slit, about an inch and a half across, so that, when the powder enters the ignited spirit in a very thin, broad film, it gives a high and broad sheet of flame, stated to be between three and four hundred inches in area. The action was shown, and the resulting light was most luminous and intense. At the suggestion of the inventor, an oxygen cylinder was attached to the lamps under the impression that an improved luminosity would be gained; but the result was disappointing, the area of the flame being much reduced, and concentrated at the very orifice of the discharging tube. Further demonstration, showed that the flame could be used as one instantaneous flash, which might be continued or repeated at will.

Dundee and East of Scotland Photographic Association.—January 14, Mr. G. G. Maclaren in the chair.—After routine business, Dr. J. K. TULLOCH: read a paper entitled, *Art, Fine Art or What?* [see page 54], which gave rise to an animated and lengthened discussion.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

THE TELESCOPIC-PHOTOGRAPHIC LENS.

To the EDITOR.

SIR,—Your editorial comment is no reply at all to the main points at issue. To those who have studied theoretical optics your remarks anent the form of the negative lens amount to nothing more than a quibble. Were it not that you introduce new matter in this comment (a style of tactics you have used in controversy with me on another occasion), I should have left it unnoticed.

You infer a slur on my patent agents; they, however, have done their duty, and find that the construction of the photographic lens I recently introduced is new. You, sir, concur in describing the Galilean telescope as "a non-photographic instrument!" It is essential in the construction of this photographic lens that the focus of the negative element be some fractional portion of the positive element (quite a new feature in photographic lenses), and, therefore, may permit of its use as an improperly corrected Galilean telescope, should the separation of the two elements be small enough when the instrument is "racked home," or the lenses at their minimum separation.

Why I should be challenged on the validity of a patent by the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY can be best explained by himself.

The next part of new matter has reference to the "small" camera for the new lens, shown at the Camera Club. Feeble is this in the extreme, and with what intent such a remark, Mr. Editor? Was not the object shown, a lamp-flame, for comparison of *size* with that of an ordinary "long-focus" lens, and that alone? Why not, in a straightforward manner, make reference to the negatives exhibited on that occasion, and say truly that "our old Galilean telescope" could not, of course, compare with the performance of the new photographic lens, in that the principle of its construction as a telescope, both chromatically and as regards the passage of the rays, is entirely different?

I have always hitherto had reason to regard the "Correspondence" columns of your paper as a medium for fair play, but never for advertisement. I am proud of being a "practical manufacturing optician," but, as such, never expected, in these columns, to have reference made to "commercial success." I venture to think, in all honesty, that the snub is not deserved. "Our Editorial Table" in THE BRITISH JOURNAL OF PHOTOGRAPHY is usually supposed to be the place for trade notices.—I am, yours, &c.,

THOMAS R. DALLMEYER.

25, *Newman-street, W.*

P.S.—In your book, just published, entitled *The Optics of Photography*, when referring to "Dallmeyer's teleo-photo objective," by whose authority, may I ask, do you state "the field capable of being sharply covered is limited?" I should further like to state that I have not been directing my "attention to the Galilean method of forming an image, so as to adapt it for photographic purposes," a view, however, that seems best to suit your purposes.

T. R. D.

[We are rather at a loss to know what the main points at issue are unless they are these, that Mr. Dallmeyer, upon introducing his teleo-photo lens to the Camera Club, was taken by surprise, and not unnaturally chagrined to learn that another lens, formed on the same principle as his, and doing the same kind of work, had been introduced eighteen years ago under circumstances sufficiently public, although not under the same name as that adopted by him. The opera-glass telescope was not made expressly for photographing with, but it did its photographic work well, and it is a mere quibble to say that, because its original intent was otherwise, it has no *locus standi* as a photographic instrument. Does Mr. Dallmeyer for a moment imagine that photographs cannot be taken unless with instruments specially constructed for photographic purposes? If so what does he say concerning several charming pictures in the last Pall Mall Exhibition by Mr. Maskell taken by a spectacle glass, which was also shown attached to one of them? What of

the singularly beautiful pictures of Russell Manners Gordon (Count Torre Bella), which in former times were the delight of the *cognoscenti*, and which, on the authority of Mr. T. R. Dallmeyer's father, we know were made by the object glass of a triple lens opera glass? Is he unaware of the fact that nine-tenths of our best optical lanterns are fitted with Petzval portrait lenses, which were made for quite another purpose, but which are generally conceded to serve their present purpose well enough? And does he not think that this may also apply, as it does, to the opera glass? His new lens may be an improvement upon it in this respect, and we have no doubt it will be; but, if the essential feature in its construction be that "the focus of the negative element be some fractional portion of the positive element," then is this condition fulfilled in every opera glass.

That Mr. Dallmeyer's patent agent did not find the prior publication of this application of the opera glass is not to be greatly wondered at, as the search for prior publication by agents is usually confined to what has been previously patented. Those conversant with patents will smile at the acceptance of the dictum or opinion of a patent agent relative to the actual novelty or validity of a patent; but we do not here raise, nor have we raised, any question as to the validity of Mr. Dallmeyer's patent, and this for the simple reason that we do not know what he *has* patented.

The intent of our remark about the small camera to which Mr. Dallmeyer had his lens affixed is this: He seems to have made a point of the fact, as stated by us, that our opera glass gave a sharp image only in the centre of the field of a twelve-inch ground glass, such sharpness, we stated, being confined to a few inches around the centre. Why we said that the new lens did no more was deduced from the facts (1) that, when examining the lamp flame in Mr. Dallmeyer's office on his ground glass, we slightly rotated the frame containing the ground glass, and found the image to disappear at no great distance from the centre; (2) that such specimens of the work of the lens as were shown us by Mr. Dallmeyer did not exceed quarter-plate size; (3) that his subsequent exhibition camera was small; and, finally, that when lenses of not large diameter are mounted in a somewhat long tube, and this at no great distance from the ground glass, it is not possible that a large area can be covered. Even the mammoth Lick telescope has its covering power confined to the relatively small area of five inches!

The chief issue at stake is, we conceive: Has Mr. Dallmeyer been anticipated in the introduction of the teleo-objective or not? If he has, of what value is its claim to novelty, much less to protection by patent? Mr. Dallmeyer does not accept with the best grace possible the fact that we ourselves described fully and clearly enough an objective producing similar pictures to his own eighteen years ago. This perhaps is excusable. We can also understand his disinclination to allow Dr. Miethe priority in the application of the idea. But what can he say to the statement of M. Jarret, a French optician, who, in October, 1890, as will be seen in our "Continental Notes," publicly exhibited to a French society "an optical combination for taking photographs at a great distance," and also showed a number of pictures produced by it? This objective was certified to have been subsequently placed in the public exhibition of the Nantes Photographic Society. With this we leave Mr. Dallmeyer to cling to or reject the valuable opinion of his patent agents that the construction of the photographic lens he recently introduced is "new"—"new," that is, in the sense which would conform to Mr. Dallmeyer's own wishes.

In the concluding paragraph of the letter we are accused in one breath of both advertising and snubbing Mr. Dallmeyer! We are sure Mr. Dallmeyer will bear with us if we do not go beyond this amusing collocation of charges for ample evidence to establish the complete absurdity of both, whether taken singly or collectively. At the same time we tender him our acknowledgments for so kindly instructing us in the conduct of the various departments of the JOURNAL, an attention which by this time he must have perceived we are endeavouring to reciprocate.—ED.].

THE ORIGINATOR OF THE GELATINE PROCESS.

To the EDITOR.

SIR,—If facts are wanted to prove that Dr. Maddox, in or about the year 1871, did make negatives of an emulsion which he, at that period, informed me was a combination of *silver and gelatine poured upon a plate and dried* before exposure, I am *quite prepared to affirm before any committee that he did.* I have not communicated with the Doctor for years, and quite thought he was dead. I am pleased, however, to hear he is still in the land of the living, and, if raising my voice on his behalf will do him any good, I shall be only too pleased to be interviewed by any editor who doubts his statements. Hard words prove nothing. If those who are trying to blacken the good Doctor's name knew him, their railings would cease. I sent to the *Photographic News*, on December 22nd, a long description of the Doctor's transactions with me, but suppose they had other letters of more importance to put in.

I wrote to the Doctor upon the subject some years ago, and, if he still has that letter in his possession, I shall be only to pleased for him to publish any portion of it he feels inclined. I have not a copy of the letter, and do not remember its contents, but the facts there alluded to are extremely vivid upon my recollection. I can distinctly see the bottle of emulsion the Doctor placed into my hands, also the negatives and his instructions for preparing the plates.

I must regret I never properly tried the process, so cannot say if the emulsion supplied to me was capable of producing the negative shown me by the Doctor, but I can *positively vouch* that they were not collodion, and that they had the general characteristics of the present gelatine dry-plate negatives, and far superior to thousands produced by our amateur friends of to-day. Of course, I am not in a position to say no one produced pictures on a gelatine dry plate before the date I speak of. If there is such a one, let him come forward, and I will drop the Doctor's cause, for I am a lover of justice.—I am, yours, &c., WALTON ADAMS.

Reading.

TYLAR'S FILTER.

To the EDITOR.

SIR,—What is a novelty? This question I ask myself on reading your description of the convenient little filter which you describe and give a wood-cut in your last impression. Allow me once more to testify to its merits. I have had them in use for about ten years; I purchased them for one shilling each at an indiarubber depôt in Gracechurch-street. I made a slight alteration, which has its advantages, viz., to place a piece of rubber tubing at the opposite end, so that it can be fixed either end on the tap—consequently *self-cleansing*. Any one who cannot purchase one readily may make one out of a piece of tubing, preferably glass, place a small piece of sponge in the pipe, then some coarse charcoal, then another piece of sponge, a couple of inches of rubber piping at each end, and the filter is complete.—I am, yours, &c., A. L. HENDERSON.

OXYGEN CYLINDERS.

To the EDITOR.

SIR,—I have just read a letter in last week's issue from Mr. W. Morton Jackson in reply to Mr. Seet, and though I have not seen the letter of Mr. Seet, I gather that he has been complaining of the "ill-advised" recommendation of the jury on the Ilkeston affair in favour of gas cylinders.

Mr. Jackson, in defending the recommendation of the jury, brings my name in as influencing the jury by my statement that I had discarded gas bags in favour of gas cylinders. Now, I may say that directly after giving my opinion at the inquest—telling the jury exactly how the accident had occurred—I left the court, and took the next train for home, so that what transpired after I had left I know very little about, except the verdict; and, strange as it may seem, I have never yet seen any report of the inquest, except a condensed and slightly inaccurate one which was published in one of our Manchester papers, to which I replied.

Of course, it is quite correct that I did tell the jury I had discarded gas bags in favour of gas cylinders, and it was no use to supplement this statement with any further remarks, because the jury were a body of gentlemen totally unacquainted with such things, and could have been influenced one way or the other.

Mr. Jackson, in his own interests, representing the Manchester Oxygen Company, naturally said all he could in favour of the things in which he was commercially interested, and as naturally would damn everything else. But, if somebody had told all that could be said about gas cylinders, &c., the jury might have been influenced the other way, or, at any rate, to a modified recommendation or conclusion, so that, all things considered, I don't see that this recommendation of an unscientific jury placed in such circumstances can have the slightest weight, and therefore may be entirely disregarded.

We have, from time to time, been told of the precautions observed by one or more of the Gas Compression Companies for the safety of the users, a good deal of which I have the best reasons to doubt; but there are, in England, many separate and distinct firms who supply compressed gas and the appliances connected therewith—for instance, we have the compression companies in Manchester, and there are several in London—and, so long as we have the unrestricted commercial element, competition, I maintain there is not much chance for absolute safety to the public. Cylinders, gauges, and regulators are now offered at prices from 20*s.* to more than twice the sum for apparently the same thing, or intended for the same purpose, and how are the public to know the difference? Why, in hundreds of cases, they do not know anything but what the dealer likes to tell to tell them.

Oxygen and coal gas are cheap enough now, goodness knows, and for my own part I would prefer to pay even double the price, in whatever form, or for use with whatever appliances will ensure the greatest safety

But, having gone over this ground so often, I again assert my opinion—based upon facts, and a knowledge of what I am talking about—that we shall never be safe under the present system or systems (or want of system) until a Government inquiry and supervision is insisted upon; and, if this matter could be taken up, as I have previously suggested, by such practical men as Sir Henry E. Roscoe, M.P., and Mr. Wm. Mather, M.P., with a committee of not necessarily politicians, or professors, or lanternists, but practical engineers, then the public confidence might be restored, and it might be discovered that the present system was defective.—I am, yours, &c.,

W. L. CRADWICK.

Manchester, January 18, 1892.

DRY COLLODION POSITIVES.

To the EDITOR.

SIR,—In the early days of gelatine as a vehicle for bromide of silver, I spent most of my spare time experimenting with the then known photographic processes. I not only rang the changes of the thousand-and-one processes, but followed ideas of my own. It seemed to me, from what I heard and what I experienced, that some direct positive process was no only necessary but attainable, and I tried gelatine emulsion on paper, iron plates, wood, &c. I then tried in the same manner collodion emulsion, and with all I met with sufficient success to encourage my going on. A few of the ferrotype collodion emulsion positives I have preserved, and they still retain all their first colour and gradations. Just when I might have brought the thing to a successful issue, I found my ordinary business pursuits demanded more instead of less attention, so I packed up my apparatus, and did not look at them again until about two years since. Having at the last-named period time on my hands, I again returned to my old love of photographic research. I found it somewhat difficult to recall my ideas in matters of detail, and have been obliged to wade through a deal to recover lost ground, but my great difficulty has been to get a suitable gun-cotton. In the former time mentioned I had a cotton that was readily dissolved, and I could get a clear collodion with ten grains to the ounce of solvents; whose make it was I cannot say, but I have been unable to get anything like it since. However, I can now get a good sensitive collodion emulsion that gives a very good positive on a ferrotype plate. It seems to me that ferrous oxalate is the best developer for ferrotype positives, but recently I have compounded another developer that brings out the image quicker and with good colour. What is wanted with ferrotype positives is a good white light in which to expose. Unless you have this it is hardly possible to secure a pleasant picture. I have exposed under a transparency by gaslight, and also lamplight, and obtained by development perfect whites in the high lights on dry ferrotype plates, and I think a good gaslight is better than murky daylight in this matter. Some two years since I showed you one of my positives; you thought it less white than many you had seen, but I forgot to explain that the building it showed was painted a stone colour, the picture was really lighter than the building. I gathered that you thought a good ferrotype dry plate would bring a good run of trade, and, encouraged with this, I have done all I could to get over difficulties in the matter. Two things I need (and all likewise following in the same line) are a suitable pyroxyline, and good light in which to expose the plates. With these I believe collodion dry plate positives will give us pictures that possess a charm all their own, and that are unfadeable under all ordinary conditions. With my plates I have obtained fully exposed pictures in one second of time, and with the same emulsion good negatives in three seconds.—I am, yours, &c.,

G. M.

London, January 11, 1892.

TONING BROMIDE PRINTS.

To the EDITOR.

SIR,—As the subject of warm tones with bromide prints has now come prominently forward, I think that some experiments that I made over two years ago may interest your readers.

I remembered, in the good old days of wet plates, that I had tried uranium intensification with such plates, and that, if good brown tones could be got with them, why not with bromide paper? I found such the case, but the colour did not satisfy me, and I tried the effect of several other chemicals on the uranium. These experiments I stuck on a card, and I found them by accident in my dark room, in the damp, two years after, most as fresh as when done.

When so many letters were written early last year on uranium toning, I treated several enlargements and got the same results. I found that a uranium bromide washed out in twelve hours' running water, but, if placed in a very weak solution of sulphate of copper (electro solution), it altered the colour to chocolate, or modifications, according to how much toned with uranium, and also as to how long left in the copper.

Chloride of zinc also has the same effect, but not so good.

I showed the experiments to the Eastman Company, and they at once asked if they were permanent; so I placed strips in a printing frame partly covered up, and left in the sun for a fortnight, but I found them fade. I am now away from my laboratory, or I have little doubt that I should have found something permanent.—I am, yours, &c.,

Nutfield, January 11. F. K. BARCLAY.

MINERALISED METHYLATED SPIRIT.

To the EDITOR.

SIR,—The above is the official name now adopted for the new methylated spirit. I have reason for thinking that the permanency of the alteration is by no means settled, and would urge agitation against it, as annoying and uncalled-for in the interests of "the greatest good of the greatest number." If the object is to make the spirit undrinkable, why not secure this by some addition which shall make it distinctly obnoxious *in effect* when taken internally, without at the same time punishing all users who apply it for legitimate purposes?

Referring to the letter of Mr. W. B. Bolton in your issue of December 14, the fallacy running through it will be so evident to practical men that it is hardly necessary to further notice it. I quite agree that the Excise order does not strictly define the origin of the mineral naphtha, but, whatever theories may be culled from text-books, I believe that in commerce the term is most commonly applied to coal tar, naphtha, and according to the order, the naphtha *must* have the property, added in the indicated proportion to methylated spirit, of making the mixture distinctly immiscible when added to an equal bulk of water; it *must* be milky. The lighter ones will not give this result, and are therefore not suitable. The specific gravity, ·800, shuts out, with other light oils, both benzine and benzoline. I think I have sustained my position, but am sorry that my brief note caused such evident irritation.—I am, yours, &c.,

Scarborough, January 11, 1892. JOHN WHITFIELD.

AN EFFICIENT HAND CAMERA.

To the EDITOR.

SIR,—In reply to Mr. Geo. W. Valentine's tardy acknowledgment of my letter of December 11, 1891, *re* How to Make an Efficient Hand Camera, which he says is an emanation of his own that, although the "Adelphi" was mentioned in several papers, both photographic and otherwise, he never saw or heard of it till he saw it described in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for this year, will Mr. Valentine permit me to say it is a singular coincidence that his description of an efficient hand camera, published only last month, should so nearly resemble the "Adelphi," patented in 1890, and shown in Liverpool, Southport, Birmingham, Manchester, and London.—I am, yours, &c., T. MILLER.

141, *Broughton-road, Salford.*

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column: but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Exchange, dry plates or photographic chemicals for a retouching desk with drawer.—Address, A. B., 107, Lake-road, Portsmouth.

Table piano, four octaves, steel vibrators, offered for half-plate modern camera, &c.—Address, W. HAGUENEAU, Dickleburgh, Norfolk.

Wanted, background, rolling press, or half or whole-plate camera, in exchange for a guitar.—Address, H. J. RIDDITCH, Smith-street, Warwick.

Will exchange a new six-inch burnisher for cabinet cold rolling press with plate, or will offer for sale.—Address, A. W., 31, York-road, Hove, Brighton.

Will exchange a ship's bulwark accessory, backgrounds, and half-plate portrait lens for a 10×8 portrait lens.—Address, W. H. COOKE, 2, Landport-terrace, Southsea.

About 200 lantern slides, of best quality, in exchange for camera, lens, or other useful photographic accessories.—Address, EDWARD HUTTER, 4, Colville-gardens, Bayswater, London, W.

Pair of fine backgrounds in flatted oils, interior and exterior, 8 feet by 88 inches, new and perfect, in exchange for good violin or banjo.—Address, W. HARE, Windsor Studio, Sutton, Surrey.

Pair of handsome backgrounds in flatted oils, on linen and roller, new, eight feet by eighty-eight inches, in exchange for good violin or banjo.—Address, WILLIAM HARE, Windsor Studio, Sutton, Surrey.

Wanted, fifteen-grain tubes chloride of gold for Watson's drop shutter to fit Ross' rapid symmetrical 5×4 lens, and Lancaster's quarter-plate eyelet clip.—Address, BERNARD GREEN, Derwent Mills, Cockermouth.

Will exchange a 5×4 camera, with six double backs, for a large-size "flap" shutter (time and instantaneous) and the Index to THE BRITISH JOURNAL OF PHOTOGRAPHY for 1889.—Address, C. W. CLARKE, 32, Market-place, Devizes.

Meagher's brass-bound mahogany *carte* camera, with repeating back and instantaneous shutter, two single backs (one new), and Grubb *carte* lens, for Dallmeyer's No. 1 wide-angle rectilinear.—Address, W. A., 13, High-street, Wexford, Ireland.

Three canvas backgrounds (one interior 12 ft. by 8 ft., one interior graduated 7 ft. by 7 ft. 6 in., one exterior graduated 7 ft. 6 in. by 7 ft. 6 in.) in exchange for half-plate rapid rectilinear lens.—Address, A. MIDY, 1, Dolphin-yard, Macclesfield-street, Shaftesbury-avenue, W.

Exchange large whole-plate portrait lens, three-inch diameter, by Derogy, Paris; Marion's ten-inch roll burnisher, nearly new; Kershaw's patent instantaneous roll shutter, diameter two and a quarter inches; also Perken, Son, & Rayment's instantaneous shutter, aperture two and a quarter inches. Wanted, studio chairs, rocks, balustrade, pedestal, table, or other useful accessories.—Address, PORTER, Photographic Studio, Chippenham.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & CO.," *2, York-street, Covent Garden, London.*

R. G.—Procure the tissue and sensitise it as you require it.

G. E. S.—We are happy to hear of your success with English plates.

W. A. MEIGH.—Of Mr. Henry Park, whose address you will find in the ALMANAC.

R. LEONHARDT.—If nothing else but water get to the hypo, its working powers will not be impaired.

C. J. WOOD.—"Nottingham limes" may be obtained through any of the dealers in lantern requisites.

G. MANSFIELD.—The fifteen-inch portable symmetrical lens will be the best for enlarging your 15×12 negatives to 18×23.

MR. G. KERSHAW writes to know the address of the sole dealers in stereoscopic views by the American Littleton Company.

SILVER.—The glass is oblong in shape, and should be optically plane. Directions for silvering will be found in the ALMANAC.

H. R. WILLETT.—Probably floating particles in the atmosphere. See our article on the subject a few weeks ago.

CHARLES BERNARD.—If you procure some good artist's canvas, the formulæ for emulsion-making and development in the ALMANAC will assist you further.

R. ROBINS.—The cause of the yellow stains described is that the negatives were not thoroughly fixed in the hyposulphite of soda. A longer immersion in future will avoid them.

SALOP.—The principal difficulty in your case has been the plates. Extra rapid plates are not at all suitable for lantern slides. Procure plates specially made for the work, and use the formula supplied with them.

COLLODION.—1. Rodinal is a one-solution developer in a concentrated form. For normal exposures one part of the solution to thirty of water is recommended. 2. Probably by over-exposure. 3. Three or four minutes. 4. Increase the quantity of pyro.

FRANK PIPER.—The patents extend over a period of fifteen or sixteen years, and we could not possibly devote the time to ascertain for you the particulars you require. These you may obtain for yourself at the Patent Office, Southampton Buildings, or by employing a patent agent.

W. V. MORRIS.—The ordinary lime jet, with a reflector behind, is what is usually employed. Coloured gelatine films may be obtained from most dealers in materials for fancy-box makers. Coloured glass is better than gelatine for projecting coloured light for scenic effects.

WARDEN.—It is pretty clear that your "fixed-focus" lens is not in proper focus for the work you have been attempting. If it has been adjusted for general outdoor work, such as street views and the like, it will not be in focus for indoor portraiture. Hence the cause of want of definition.

CYMO asks if there is any advantage in using a larger source of light, such as a large gas flame, and then subduing it, by several thicknesses of ruby glass, over a smaller light with, say, one thickness of orange and one of ruby?"—None whatever. It comes, practically, to the same thing in the end.

J. C. SHARLWOOD.—One of the best all-round lenses for taking groups out of doors is one of the "rapid" type. Or, perhaps, the next best—indeed it is preferred by some—a single lens of the old-fashioned landscape form, with its aperture somewhat enlarged. A single lens is admirable for open-air groups.

T. BRAMWELL writes: "I see you instruct 'W. M. L.' to make a small negative from a large one by making a transparency by contact printing. May I ask if he could not get as good results by making small transparency in the camera, and thus save the price of a dinner for his family (if he is so fortunate as to have one)?"

A. W. P.—1. As you are an entire novice at lantern work by all means begin with the blow-through jet, particularly as you are not going to use cylinders but bags. Ample light for an eight-foot screen will be obtained with such a jet. 2. There is no necessity, in your case, to put the coal gas under pressure in a bag. Take it direct from the nearest gas bracket.

S. BEVAN says: "I made some matt varnish according to the formula given on page 786 of the ALMANAC. I have added different proportions of benzol, but the varnish dries transparent. I have warmed the plate to various temperatures, but this seems to make no difference whatever. Is there no mistake in the formula?"—The formula is quite correct. Our correspondent's failure has been brought about by his warming the negative. The varnish must be applied cold.

X. O. W. (Carlisle).—In photographing flowers the background must be chosen to suit the particular flowers to be photographed. That which would be most suitable for one group might be just the reverse for another. In all cases the backgrounds must be selected, and arranged to suit the subject. Better study the flower studies of Mr. H. Steveus, Mr. and Mrs. Payne, and others. These works will give you more instruction than can be conveyed in this column. Our publishers will supply the back numbers referred to.

P. E. J. (Leeds) says: "On mixing some developer, pyro and sulphite of soda, it became a dark sherry colour in a few hours. Trying a week afterwards, I found it work just the same as if it were not discoloured. Do you see any objection to its use, as I do not wish to waste it unnecessarily?"—If the solution works all right, there can be no objection to its use.

R. O. W. asks: "1. If burnt-in photographs on porcelain and earthenware are patented or not?" Several patents have been taken out in connexion with ceramic photography, but, so far as we can recollect, none of them are in existence at the present time. 2. Any of the Staffordshire potters, who do fine ware, will supply plaques such as you require, but, we surmise, they will have to be made expressly to order. In this case a large number must be ordered at a time. 3. If the design be original, it can be registered, and will then become your property. A mere design is not the subject for a patent.

E. C. MAY writes: "Can you tell me how I can flatten out some Eastman films which have curled up so violently as to be almost useless in the printing frame? I unfortunately neglected the recommendation of the Company to keep them in a pressure frame, and immersion in water and in the glycerine soaking solution has no effect whatever. As some of these are very fine negatives, I should be sorry not to be able to print them, and I can't help thinking there must be some means of straightening them out and keeping them flat. I need not say I have already tried all the usual devices for flattening paper, &c., but this celluloid appears to be very much more elastic."—Possibly some of our readers can suggest a remedy to Miss May.

PAARL says: "I enclose enamelled scrap. Notice how the print, when pulled off glass plate, leaves part of enamel on glass. I can't think why. Can you suggest? Do you think it is grease? To remedy and doctor up my collodion I afterwards added a few drops of castor oil, as suggested by yourself in one of the year-books, but then the prints would not leave the plates at all, and stuck on like grim death, and I had to soak them again in hot water to get them off. 2. Like many other poor unfortunates, I am troubled with blisters in my prints, and I tried the suggestion of soaking them in spirits before toning, but I found then that they took an hour and more to tone, and many would have a mealy appearance when dried. I now use the spirits before fixing instead, and, although it uses up a deal of spirit, yet it's better than having them big blisters. Oh, those makers of albumenised papers, how I bless them! Three years ago we were never troubled with blisters to the extent as now."—In reply: 1. The cause of the trouble is want of adhesion between the collodion film and the gelatine used for enamelling. From the appearance of the piece of print we imagine too much of the gelatine is removed in the squeezing, or that the solvents of the collodion were not thoroughly eradicated before the print was laid down upon it. Without knowing definitely how our correspondent works, we cannot give any more definite opinion. 2. Try Mr. W. D. Richmond's remedy. Immerse the prints in methylated spirit as they are taken from the frames, and before proceeding to wash out the silver; then treat in the usual way. This is the most perfect remedy for blisters we have tried.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—January 28, Ordinary Meeting. Visitors invited.

CLEVELAND CAMERA CLUB.—The next meeting of the Club will be held on Tuesday, January 26. Subject for discussion, *Flashlight*.

PHOTOGRAPHIC CLUB.—Jannary 27, Annual Lantern and Musical Entertainment (ladies' night). February 3, *Photo-micrography*, Mr. T. Charters White.

PROPOSED PHOTOGRAPHIC CLUB FOR HEXHAM AND DISTRICT.—Mr. John Gibson, jun., of Battle-hill, Hexham, writes to the local paper, saying that it is proposed to form a photographic club for Hexham and district. A number of local photographers have expressed a wish for such a club.

PROFESSOR W. K. BURTON, in conjunction with Professor J. Milne, is preparing a work on the recent great earthquake in Japan, to be illustrated by a number of photographic reproductions. For the sake of comparison, there will be two plates showing, on a small scale, the effects of earthquakes in Italy and other countries.

MR. A. C. TOWNSEND, the cashier to the Birmingham Gas Department, was recently presented with a valuable set of bronzes by his colleagues as a mark of their esteem on the occasion of his leaving, after fourteen years' service. Allusion was made to the loss at the annual show of his admirable prints, and a hope expressed that in his new capacity as cashier and general manager to Mr. W. Tylar he would meet with every success and prosperity.

"THE Artistic and Literary Association, Limited," is the designation of a new publishing company, whose chief object is "to afford to those of its members who are artists or authors the unique advantage of sharing as publishers as well as originators in the profits accruing from their own works." Mr. Francis George Heath has consented to accept the position of managing director and editor in chief.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1656. Vol. XXXIX.—JANUARY 29, 1892.

SIMPLIFICATION OF URANIUM TONING.

Last week we directed attention to the use of a solution of potassium ferridcyanide and ammonium sulphocyanide as a reducer for negatives and bromide prints, the suggestion being made by Mr. Haddon in the course of some remarks on uranium toning, which will be found on page 60. As the subject of toning bromide prints appears, from the number of letters we receive, to maintain its interest among photographers, we will redeem the promise given last week to treat of the further suggestions of the gentleman named.

As ferrocyanide of uranium is soluble in alkaline solutions, and ordinary water, as is well known, on account of the presence of chlorides in it, usually has a tendency to give an alkaline reaction, the employment of an acid solution for washing the print will obviate any undesirable reduction of the toned image. But the value of this recommendation is increased when taken in conjunction with others in connexion with the subject.

The necessity for reducing the deposit of a uranium-toned print down to the desired depth and colour has, it seems, arisen from the improper composition of the toning solution. The brown deposit in the solution which appears so soon as the toning action commences is caused by the disproportion between the uranium nitrate and the potassium ferridcyanide. The former should be in excess, and thus the solution would remain clear, inasmuch as there would always be some uranium in solution with the undecomposed ferridcyanide, the ferrocyanide at the same time remaining in solution.

By the employment of a toning solution such as that suggested by Mr. Haddon—namely, a one per cent. solution of uranium nitrate in two ounces of water, to which a drachm of acetic acid and two grains of potassium ferridcyanide have been added, one gets a solution considerably weaker than that hitherto employed by the experimentalists, and one which fulfils all the conditions laid down for direct toning as opposed to the method of toning by reduction—that is, building up an image and reducing it with water. Not only is this a more economical way of working, but it is less troublesome, and is really a less roundabout method of toning.

Still another disadvantage of the old system of uranium toning that we may consider removed by employing a dilute solution of uranium with the ferridcyanide in excess is the need of developing the original picture to a particular tone. We have always held that there was never any real necessity for getting a brown-coloured image for toning with uranium, since we have in our possession slides of a normal black toned to a red colour by means of uranium.

A correspondent in the present number of the Journal draws attention to the fact that uranium solution can be used for toning platinum prints, which obviates the employment of the special paper for obtaining sepia effects. This further emphasises the fact that specially developed images of a brown colour are not necessary for uranium toning, since between the normal colour of developed bromide prints and platinotype pictures there is, as a rule, little, if any, difference. We may finally point out that the deposition of ferrocyanide of uranium on silver or platinum is a mechanical, and not a chemical, action; so that the process is, after all, not a toning one in the ordinary meaning of the term.

COATING GELATINO-CHLORIDE PAPER.

There are still, we have little doubt, many amateurs who sensitise their own albumenised paper in preference to using the ready-sensitised, while the practice is, of course, general in professional establishments. But, if those who go to the trouble of thus floating the paper on its sensitising bath were asked why they did not make their own gelatino-chloride paper, they would, in the majority of cases, be found to reply that they had not the time, or that the trouble and expense were too great.

Now, as a matter of fact, when a very slight variation has been made in the arrangements, the coating of gelatino-chloride paper is little, if any, more trouble than sensitising albumenised paper in the ordinary way. The emulsion, numerous formulæ for which have been published, presents no difficulty, nor does it require the care and nicety requisite in the case of bromide emulsion. It is not a washed emulsion, which robs it of nine-tenths of its terrors to most workers, and the ingredients may be put together in the light of an ordinary room; after a few minutes' digestion, to ensure the combination of the different ingredients, the preparation may be filtered, and is then ready to apply to the paper.

The trouble involved in preparing the emulsion is scarcely greater than that expended in getting the silver bath into condition for use, and, after that, there only remains the single operation of coating the paper and hanging it up to dry. The coating is no more trouble than floating, while the drying of the gelatine paper only differs from that of the albumenised after sensitising in that it takes longer; but this is of very little importance when a moderate quantity is prepared at once; and, as the paper keeps very well, this is the proper course to adopt.

As gelatino-chloride paper is growing in popularity, and undoubtedly possesses so many advantages, it will be surprising if it is not more generally introduced as an article of manufacture in many studios in the near future. Independent of the claim to greater permanency, it lends itself to such a variety of different styles of work, including matt or enamel effects, and may be applied to almost any character of surface with a little preparation in the way of sizing. Indeed, it is not

too much to say that gelatino-chloride emulsion forms a new power in the studio. Then, when the comparative cost is looked at, the user will probably be surprised how greatly it is in his favour as compared with albumen paper.

The first question that will trouble the amateur will perhaps be that of a suitable paper, though we believe that plain photographic papers are obtainable in small quantities at some of the dealers' establishments. In the event of such a paper not being directly obtainable, the best substitute must be found. For large work, or for matt or rough effects, this will not be at all difficult, as almost any of the various grades of cartridge or drawing paper will answer if the sizing be suitable, and, if not, this can be easily remedied; but for fine work, whether with the matt or enamel surface, the difficulty of finding a paper of sufficiently even texture, and without mill marks, will be much greater. We have known cases where "job lots" of inferior or damaged albumenised paper have been picked up at such prices as to make it worth while to remove the albumen and salting; but, of course, to fall back upon such paper at ordinary prices is out of the question.

Where, however, such a supply is available—and such lots are by no means rare at Stevens' and other sale-rooms—nothing better for our purpose could be obtained, whether for matt or surfaced effects. The first operation is, of course, to remove the salt from the paper, the albumen being removed or allowed to remain as may be thought best. If the albumen is to be removed, then all that is required is to soak the paper in several changes of cold or tepid water, until all traces of soluble chlorides have been removed. The sheets are then hung up to dry, and are better finished off with a hot laundry iron, to remove creases or unevenness. It is needless to say that the greatest cleanliness must be observed during the process, or the paper will suffer seriously in its damp state; it is also advisable to handle it as little as possible, and to avoid rubbing the surfaces together, which will raise the fibre.

When the albumen surface is to be retained, the method of preparation will be different. Naturally, the object will be to coagulate the albumen, and this can only be satisfactorily done by means of moist heat. It is of no avail to pass a hot iron, even at scorching temperature, over the paper, the albumen will remain as soluble as before; nor is it of any use to apply alcohol for the purpose, as has been often recommended. We have never found alcohol, even after prolonged application, to produce any effect in the desired direction. But a momentary dip into water at boiling, or nearly boiling, temperature performs the coagulation perfectly, and, after that, it only remains to allow the paper to soak in tepid water until the salt is removed. If it be required to operate upon full sheets, some little difficulty may be experienced with ordinary appliances, but sheets up to 12×10 can be satisfactorily manipulated with the appliances to be found in every household. It suffices to dip the paper momentarily into the hot water, and it is better to withdraw it at once, as the coagulation is instantaneous, while a longer immersion removes more of the size from the paper. So rapid is the coagulation, that, if a piece of paper be rolled up *dry*, and immersed in that state in boiling water until the latter has penetrated it, the albumen is coagulated without having time to adhere to the next surface of paper. This plan may possibly be of use for large sheets.

In the case of rougher kinds of paper, it will depend upon the normal sizing being suitable or not whether it has to be resized. When there is a great amount of alum in the size, the effect upon the colour of the image is sometimes so great as to completely ruin its capability of toning. In such instances the paper will require a preliminary sizing of arrow-root, applied by rubbing the smooth cold paste well into the pores of the paper with a piece of sponge. The sizing and even the texture of the paper exert a most powerful influence on the printing colour of the emulsion, the same emulsion perhaps giving on half a dozen different samples of paper as many different colours, and in many instances the difference will be clearly distinguishable after toning.

A satisfactory quality of paper having been obtained, the coating is perfectly plain sailing. We have a choice of two methods—first, pouring the emulsion on to the paper on a levelled slab; and, second, floating the paper on the emulsion. The first seems the more convenient in many ways, especially for small sheets, while for larger sheets it offers the promise of greater uniformity of result, as a measured quantity of emulsion can be applied to each sheet and allowed to level itself. In adopting this method it is desirable, if not absolutely necessary, that the paper be first damped in order that it may lie flat.

In working small sheets, say, up to $8\frac{1}{2} \times 6\frac{1}{2}$, though 12×10 may be manipulated in the same way with care, the wet paper is squeegeed on to a sheet of glass, and the surface dried with blotting-paper. A pool of emulsion is poured on to the centre, and this is led over the whole surface by means of a glass rod, or the finger, and the surface drained off pretty closely. The plate, with the paper still attached, is then laid on a levelled slab for a few minutes until the gelatine has set thoroughly, after which the coated paper is stripped off, and hung to dry. After a little practice, three or four dozen sheets of paper may be squeegeed, coated, stripped, and hung to dry within the hour. When manipulating large sheets, the same general course is followed, but the paper is squeegeed on to the slab and a measured quantity of emulsion spread over it; when set, this is stripped and hung in the ordinary way. The plan of coating large sheets has the advantage that the smaller sizes cut from them have clear edges.

The floating method is, perhaps, better for large sheets, and is, moreover, more expeditious, while it saves the necessity for damping the paper previous to coating. The floating may be performed in a variety of ways, but we shall confine ourselves to describing the method when a dish the full size of the sheet of paper is used. There are plans by which a sheet of paper is drawn over a narrow trough of emulsion which, in strictest parlance, can scarcely be called floating; but such methods generally involve the use of some special apparatus or appliances, and are therefore beyond the scope of the present article.

The dish to contain the emulsion must be provided with some means for keeping up the temperature of its contents; beyond this, any ordinary dish will answer. A common porcelain dish, standing inside a larger one, into which hot water is poured and changed from time to time, forms the simplest plan. The arrangement we employ ourselves consists of a tin dish with sloping sides, like an ordinary baking dish, fitting into another with straight sides, and about four inches deep, to hold hot water. The emulsion dish is coated with Aspinall's bath enamel, which we have found to answer this purpose and similar ones admirably.

To coat the paper, filter a sufficient quantity of emulsion into the upper dish, having filled the outer jacket with hot water. Arrange at one side of the dish an accurately levelled sheet of glass, a little larger than the paper to be coated, and let one

end of the glass project an inch or so over the edge of the dish. Lay a sheet of paper on the surface of the emulsion in the usual manner, and with the ordinary precautions to avoid air bells. Allow it to remain until it lies perfectly flat, when comes the only little bit of skill required. Some writers have directed that the sheet of paper be drawn backwards horizontally on to the levelling slab; but, irrespective of the fact that under such conditions it does not "draw" comfortably, we think a better result is obtained as follows.

Pick up the sheet by the two corners farthest from the levelling slab, and raise it quickly and without hesitation into a perpendicular position, with its lower edge resting against the edge of the levelling slab so that the drainings fall into the dish. By the method of lifting a considerable quantity of emulsion will adhere to the paper, but will rapidly find its way back into the dish. Watch this sharply, and as soon as the sheet has drained sufficiently draw it on to the slab and lay it down, commencing, of course, from the end where it is already in contact. The emulsion remaining upon the paper will quickly level itself, and in two or three minutes will be "set," and the sheet can be hung up to dry.

With regard to drying, an open room, in which a stove is burning, will supply all the heat necessary to dry the paper in a few hours. It is not well to dry too quickly, or the paper will "cockle," and give trouble when it goes into the printing frame. If dried at the ordinary temperature, beyond a slight curl there is no departure from flatness, and no trouble. When dry, the sheets should be put together under pressure, for the double purpose of securing flatness and protection from the atmosphere.

In conclusion, we can promise to any who may adopt the use of home-made gelatino-chloride paper a little surprise, not only with regard to the ease with which it is made, but also its economy.

TONING CARBON TRANSPARENCIES.

A few weeks back, in an article on *Lantern Slides by the Carbon Process*, we alluded to the facility with which the tones on these pictures could be modified after they were finished. That remark has brought us several letters, asking the method by which it is accomplished. In the first instance, it may be explained that the principle involved in the toning or intensification of a carbon picture differs widely from that of a silver one. In a silver picture it is the colouring matter forming the image that is acted upon by the toning or intensifying agent; whereas, in the carbon picture, it is the vehicle holding it—the gelatine—that is affected, and not the pigment, except in one or two cases. Here is one.

Supposing the tissue used is one that contains alizarine as one of the constituents of the colouring matter, as is the case with most of the purples and browns now in the market, and it be desired to give it a warmer tone, all we have to do is to immerse the picture in an alkaline solution, say one of carbonate of soda ten grains to the ounce of water, which will increase the redness or brilliancy of the alizarine. Again, in the case of permanganate of potash, which is so frequently used for the intensification of weak carbon transparencies and negatives. Here the permanganate tends to destroy such organic colouring matters as alizarine, cochineal, indigo, and similar materials, while manganic oxide is formed in the gelatine. Permanganate of potash is an agent seldom used for toning transparencies, by reason of the yellow tone it confers. If, however, the tissue be coloured with China ink only, as we believe is the case with the special transparency of the Autotype Company, and the application be brief, a pleasing brown tone may be obtained.

The most general plan adopted for toning carbon transparencies is analogous to dyeing; that is, the colour is formed by double decomposition in the film. By this method, as we have just said, it is the gelatine alone that is influenced. In making the slides, as described in the previous article, the glass supporting the picture is prepared with a substratum of insoluble gelatine. Now, it is manifest that any reagent which would act on the gelatine composing the picture would also act upon that forming the substratum, unless some precaution were taken to avoid it. As, however, the carbon tissue is coated with collodion prior to development, we have in the finished picture a film of that material intervening between it and the substratum. But the kind of collodion usually employed for the purpose is scarcely sufficient protection if the toning has to be long continued. Therefore, when it is intended to resort to toning, a somewhat thicker collodion, of a horny and repellent character, to which a small quantity of castor oil has been added, should be employed. Then the toning action can be completed before the film is permeated by the toning agents. Some years ago—see page 4 of our volume for 1885—Mr. E. W. Foxlee pointed out that by treating the transparency for a few minutes with very dilute hydrochloric acid, and then well washing it, the tendency to staining from the substratum was avoided.

It should be borne in mind that, as it is the gelatine alone that is acted upon, it is advantageous to select a tissue that contains a maximum proportion of it with a minimum of pigment. With such a tissue the image is obtained in high relief, whereas with that made specially for transparencies, which is highly charged with pigment, there is but a mere superficial layer of gelatine. Most of the ordinary portrait tissues fulfil these conditions.

With regard to the toning agents that can be employed, they are almost unlimited. For example, if a transparency be immersed in a dilute solution of perchloride of iron, then well rinsed under the tap, and afterwards treated with a solution of gallic acid, a rich purple black will be obtained. By substituting for the gallic acid pyrogallic acid, infusion of nut galls, logwood, &c., a great variety of purple and black tones can be secured, also by using other salts of iron for the perchloride. By treating the picture with proto-sulphate of iron, followed by ferrocyanide of potassium—the yellow prussiate—a blue colour, Prussian blue, will be obtained, suitable, if not overdone, for moonlight effects. A solution of bichromate of potash, succeeded by one of acetate of lead, produces a yellow—chrome yellow. Iodide of potassium first, and bichloride of mercury afterwards, gives a light red—iodide of mercury.

A very nice brown tone is obtained by first immersing the transparency in a one or two per cent. solution of nitrate of silver, then, after washing, applying the ordinary acid pyrogallic solution, to which a few drops of nitrate of silver solution have been added, as in intensifying a wet-collodion negative. With the silver method, it is advisable to just treat the picture with a dilute solution of cyanide of potassium, as a safeguard against after alteration.

Whatever method of toning or dyeing be used, it is necessary to rinse the picture well between the first and second treatment, otherwise there will be a danger of surface stains. The strength of the solutions used is of minor importance. The stronger they are, the quicker is the action and the less it is

under control. When they are very dilute, if the desired effect is not secured in the first applications, they may be repeated several times if necessary. But it should be kept in mind that an unduly long treatment may give time for the solutions to penetrate the collodion film, and thus cause staining in the substratum.

Photography Discovers a New Planet.—On some of the photographic plates taken by Dr. Max Wolf last month two minor planets were discovered. One has been identified as already recognised and numbered, but the other is believed to be new, and, if correctly so, will be numbered 323.

Meteorological Photographs Wanted.—On March 15 to 18 will be held an exhibition of instruments, charts, maps, and photographs relating to climatology. The Exhibition invite the co-operation of all who may be willing and able to help them, as they are anxious to obtain as large a collection as possible of such exhibits. Besides instruments and apparatus, they will be glad to show both photographs and drawings of suitable kinds.

Collection of Moon Pictures.—The Directors of three of the largest Observatories in the world, those of Lick, Harvard, and Paris—Professors Holden, Pickering, and Admiral Mouchez—are expected to co-operate in making a proposed volume, representing, upon a large scale, the best results that can be secured in the shape of lunar photographs, thus placing on record a detailed description of the lunar surface, the value of which, for comparison with observations and photographs of the future, can scarcely be over-estimated.

What has already been Done.—Professor Holden had a grant of two hundred dollars, made to assist in perfecting his apparatus for lunar photography. He offers to give the results of his work to the Smithsonian Institute for publication at some future day, if desirable. Then Professor Pickering has already obtained a valuable series of lunar photographs at the Harvard Observatory, which will be supplemented by others taken at the high-altitude station of the University, situated in the mountains of Peru. And, finally, Admiral Mouchez has promised his co-operation in securing photographs of the moon of the highest attainable excellence.

The Maddox Fund.—The following is a further list of subscriptions to this Fund:—George Mason, 2*l.* 2*s.*; John Spencer, 2*l.* 2*s.*; F. H. Verel & Co., 3*l.* 3*s.*; Albion Albumenising Company, 2*l.* 2*s.*; Annan & Son, 1*l.* 1*s.*; William Lang, jun., 1*l.* 1*s.*; Sir H. Trueman Wood, 1*l.* 1*s.*; R. W. T., 2*l.*; P. Lange, 2*l.*; A. W. Chapman, 3*l.*; T. C. Hepworth, 1*l.* 1*s.*; W. I. Chadwick, 1*l.* 1*s.*; London and Provincial Photographic Association, 2*l.* 14*s.* 6*d.*; L. E. Clifts, 1*l.* 1*s.*; C. G., 1*l.* 1*s.*; Spen Valley Photographic Society, 3*l.* 10*s.*; Professor Stebbing, 1*l.*; Thomas Curties, 1*l.*; *Photographic Review of Reviews*, 2*l.* 2*s.*; G. H. Rodwell, 2*l.* 2*s.*; Jeffs & Sons, 1*l.* 14*s.* We again remind intending subscribers that the Hon. Treasurer of the Fund is Mr. Francis Cobb, Riverdale, Twickenham, S.W.

Orthochromatic Plates for Astronomical Photography.—We are informed that MM. Fabre and Andoyer photographed the eclipsed moon at Toulouse Observatory on November 13, 1891; and some of the pictures obtained were exhibited by them at the meeting of the Paris Academy of January 11, with a note on the method of production. Collodio-bromide and collodio-chloride plates were employed, both kinds being treated with eosine and cyanine to render them orthochromatic. The former kind of plate was found to be relatively more sensitive to red and yellow rays than the latter, although both were stained with the same dyes. It is proposed, therefore, to use collodio-bromide orthochromatic plates to obtain photographs of Mars, Jupiter and the red spot, and coloured stars.

The New Methylated Spirit.—Messrs. A. & J. Warren, wholesale druggists and licensed makers of methylated spirit an finish, write: "As regards obtaining unmineralised methylated spirit, it is less roundabout to make *direct* application to the Commissioners of Inland Revenue, Somerset House, London. They, on receiving the application, will see that the proper officer deals with the matter. Your correspondent spoke of a £200 bond, but the Board of Inland Revenue do not, we are given to understand by Excise authorities, contemplate demanding this where less than fifty gallons is required per annum. Our experience hitherto is that no one connected with a medical or scientific institution has been refused the power of obtaining unmineralised methylated spirit, provided that the element of retailing does not come in, and that he be able to order not less than five gallons at a time of a methylator, *not a retailer*."

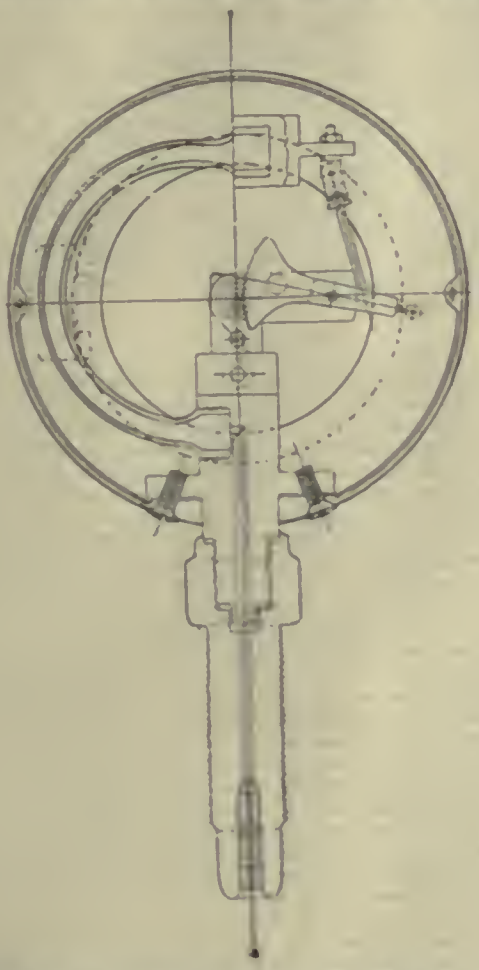
Ten Years' Sunshine.—Not—let us hasten to interpolate—continuous sunshine, is the leading part of the title of a useful new publication issued by the Meteorological Council, *Ten Years' Sunshine in the British Isles*, 1881–90. The observations have been taken at nearly half a hundred stations, and mainly by the Campbell-Stoke Sunshine-recorder, which registers bright sunshine only uninterrupted by mist or cirrus clouds. Jersey takes the happy position of the most favoured locality for almost every month of the year, the sun having shone there even in December for twenty-three hours out of every possible one hundred. Dublin comes next with a record of twenty-one per cent., while unfortunate London only registered two per cent. Everywhere December was the worst month. A great increase is noticeable in February, when Jersey again has the greatest amount, viz., thirty-one per cent., and London the least, nine per cent. In April, however, the Metropolis begins to improve more favourably with other places situated in the suburbs, and May is the sunniest month in the year, while June and July are by no means so sunny as might be expected. August is, generally speaking, a good month, September and October exhibit a considerable decrease, and November is the only month in which the Channel Islands are not the most sunny in the British Isles. The seacoast, generally, is more sunny than inland parts, while large manufacturing cities have a poor register compared with neighbouring localities outside their boundaries.

Bromine.—Bromine, which some years ago was "ringed" up to an extraordinary price, to be followed by an extremely depressed rate, has, for some time, been at what are more like normal quotations; to what extent the establishment of rival manufactories has influenced this, we are unable to say. From an interesting account in *La Nature* we learn, for example, that while no longer ago than 1887 America imported fifty tons per annum of bromine at a value of ninety thousand francs, that country now produces enough for her own wants and has ceased to import the chemical. Photography and medicine together are accountable for the use of more than two-thirds of the total amount produced, bromide of potassium being the form in which it is employed. The manufacture of colouring matter accounts for the rest. It is much employed as a disinfectant; after the terrible disaster of Johnstown it is stated that over three tons were employed for the purpose. In America, Michigan was the first seat of the manufacture, about seven years ago.

Incandescent Mantles.—The extreme fragility of the mantles employed in the new Welsbach system of incandescent lighting is generally recognised as a serious drawback to the use of the light, to overcome which Mr. E. Clifton has made a suggestion which, if carried out, would probably allow of the mantles being handled or moved with no fear of their being injured. This consists in forming an outer mantle or shell of pipeclay or similar material, in one side of which is left an aperture sufficiently large for the light to reach the condenser. A fracture of any portion of the textile mantle would be of no consequence so long as it was complete at that part through which the light was emitted to the optical system.

OXYGEN PRESSURE GAUGES.

A perusal of the valuable paper on *Oxygen Pressure Gauges*, by Mr. Budenberg, read before the Lantern Society on Monday evening, and which will be found on another page, will go far in restoring the confidence in pressure gauges that has not unnaturally been shaken by recent explosions. One could not listen to the practical remarks of this gentleman, see the specimens of the stages of manufacture, and note the tests employed, without experiencing a feeling of satisfaction that the days of explosions had passed away. We here show



a reduction of an enlarged drawing of the Schaeffer Budenberg gauge which was suspended in the room. The check patented by Mr. Morton Jackson for preventing the sudden rush of gas into the gauge is shown in the tube near the bottom of the drawing, and we join Mr. Budenberg in expressing our belief that *absolute immunity* from chemical explosions will be ensured by its presence. We invite a careful reading of the paper in question.

"IMPRESSIONISTIC PHOTOGRAPHY."

Perhaps there was never a greater contradiction of terms than that expressed by the two words heading this article, unless it be "impassioned photography," which the loose in speech have already affected. To listen to the crowd of scribblers, whom Mr. Whistler so often delights in castigating, the unsuspecting might think "impressionism" in art were a new thing, and yet 'tis as old as Aristotle, though the name serves as a label, nowadays, to distinguish the school of Pissaro and Monet, both scientific experimentalists rather than artists. But the height of ridicule was reached when a few *dilettanti* began to talk of *impressionism in photography;* and it is significant that these were the advocates of the most mechanical of all photography—*i.e.*, the *pinhole*—thus showing how the fool is ever discovering himself for the benefit of the multitude.

Impressionism has been looked upon as something mystical by the public, and yet it simply means that a picture is the individual expression of some painter. Velasquez was an impressionist, and so is Mr Whistler, but neither labelled himself anything but "artist," the assumption of the term "impressionist" being left for those who practise the art of the cheap-jack, and are convinced by the clouded "pinhole" on rough paper. Indeed, cafism could scarce go further than in the assertion that impressionism meant the subordination of detail to general sentiment, and so the driveller mistook breadth for impressionism. Is Velasquez' portrait of Philip IV. like a wretched pinhole printed on rough drawing paper?

The gist of the matter is that true impressionism is as old as the hills, and is merely a name for an *individual artistic expression without the help of mechanical aid.* The Parthenon was impressionistic architecture, the builder's villa is not; the Venus of Milo was impressionistic sculpture, the work of the modern Italian is not; the paintings of Velasquez are impressionistic, for he ignored the *laws* of perspective, as have all good artists; the work of Mr. Frith is not. An impressionistic photograph is a mere contradiction of terms; *no such thing can ever exist*, for the photograph is a *mechanical* drawing of something *objective* in nature, no matter how it be focussed, or by what method taken; it is not an "impression" at all, it has passed through no *mind*, "as through the last alembic," but is an impersonal, machine-made drawing. Therefore, to talk of impressionistic photography is to court ridicule and write oneself an ass.

As I have previously said, those who in photography have dared to assume this title are the most mechanical of all photographers—more mechanical than the "sharpist;" for the "pinheadist" focusses by measure or not at all, and has no power of seeing how his focus comes, and modifying it by stops; moreover, the drawing is not nearly so like an ocular impression of objects as is the drawing obtained by focussing the chief object and throwing the rest out of focus, though all methods give petty and unsatisfactory results.

That painters long ago felt the artistic pettiness of the ordinary perspective drawing is well known, and any one with a knowledge of perspective can apply its laws to pictures of the great masters of painting, when they will find those pictures are not built up in accordance with the laws of perspective at all, but solely upon individual impressions. On the other hand, such a study will reveal to the student why all pictures produced by the help of mechanical aids look so petty, to wit, Canaletto and some of the Dutchmen, though Canaletto's magnificent colour to some extent hides these defects. I believe Fortune has the credit of being the first to publicly disown the use of perspective; but that matters little, for our eyes tell us others discarded it decades before, and, if Fortune made such claim, the worse for him, for it stamps him as vain and dishonest—qualities seldom found apart. Quite recently a London impressionistic painter told an interviewer that Impressionism had nothing to do with photography. How the painter must have despised his pupil when he found it necessary to tell him that very obvious fact! It is useless for *dilettanti* to wriggle and call things by false names; photography is not art, and even to use photography as a basis for art, as did Mr. Mortimer Menpes, is but to get yourself looked upon as a charlatan and impostor. *Vide* also also the correspondence upon Mr. Herkomer's famous *Idyll*. If any student will select a suitable landscape, and watch it under the changing conditions of atmosphere, light and shade, for a few months—making notes on every new effect and taking photographs of the different effects—then comparing them with his notes—he will, at the end of six months, feel like kicking his lying camera to the zenith, and go stone-breaking as a more honourable employment. There are a few photographers with artistic tastes, and let me advise them to begin at once and learn to draw, and take up etching or water-colour painting, and let them tell us what they think of "art" (?) photography; and, as for the great body of amateurs, they would be far better occupied playing golf—both for the sake of their health and manhood; for there is some quality in amateur photography that seems to eat into the honour of many of its practitioners, and lead them into misrepresentation and worse sins. That quality is *vanity*—for your amateur photographer is the vainest creature on this globe—the first row of the ballet excepted. Already the velvet coat—that badge of the artistic pretender—is to be seen in the halls of *the art*.

A. R. S.

ART AND GENERAL NOTES.

"Picture Frames."—We understand that in the Corporation Art Gallery may now be seen the portrait of the German Emperor which his Imperial Majesty presented to ex-Lord Mayor Savory. *The frame is said to be elaborate.* The portrait of Alderman Savory, in his Lord Mayor's robes, is also exhibited at the Guildhall Gallery. No artistic interest can be attached to these pictures, and the same

remark does not distantly apply to some of the exhibits of the late Photographic Exhibition, the frames of which elicited universal condemnation.

Photogravure.—It is allowed that the increasing popularity of the art of photogravure is becoming very marked. Many of Sir Frederick Leighton's pictures are reproduced in this manner. What is for the public good, however, says a contemporary, is sometimes attended with disadvantages. There can be little doubt that the art of photography practically destroyed miniature painting, and it would be something to regret if photogravure was to be the means of stamping out mezzotint and line engraving.

Medals in Calcutta.—The Calcutta Art Society has awarded the Viceroy's gold medal to Mr. W. H. Jobbins for his *View of Kinchinjunga*, whilst the Society's gold medal has gone to Mr. W. H. Vernon for his painting of *A Lonely Mere*. Mr. Jobbins is a member of the Photographic Society of India, and we should be pleased to know that the picture which gained the Vice-Regal award in question was a photograph.

Artists and Photography.—Mr. C. P. Sainton is about to place on exhibition at Messrs. Dowdeswell's galleries a series of illustrations of *London Street Life*. We believe that Mr. Sainton is one of the new school of artists that does not disdain the direct employment of photography, although the school in question displays some reluctance in having the fact made known in art circles. Why is this?

GAUGES FOR HIGH-PRESSURE GASES.

[A Communication to the Lantern Society.]

The frequent recurrence of late of more or less violent explosions connected with the use of pressure gauges on oxygen cylinders appears to have created much uneasiness, and even alarm, in the minds of all interested in the application of these cylinders for lantern work. In consequence, pressure gauges in general have been emphatically condemned; and even upon the best authorities, lanternists are strongly advised to discontinue their use entirely. The great utility of these gauges in enabling the manipulator to readily ascertain the exact quantity of gas contained in a cylinder is, however, universally acknowledged; and, before urging the discontinuance of their use, careful inquiries should surely be made to ascertain what has been the precise cause of these accidents, and whether means cannot be found or devised for preventing them in the future. In claiming this amount of consideration on behalf of these instruments, I would plead that, so far as my experience goes, these accidents invariably admit of a simple explanation, and are the result of either gross carelessness or ignorance on the part of the maker, or operater.

All that is required is that lanternists should assure themselves that the gauges they use are properly made and fitted for the particular purpose upon the principles which are now fortunately well understood; and, if this were universally done, I have little hesitation in prophesying that nothing more will be heard of these explosions—at any rate in connexion with pressure gauges. It is the special object of this paper to draw your attention to the necessary safeguards; but, before entering upon a consideration of these explosions themselves, it will be necessary to give you a cursory description of the construction and mode of manufacture of pressure gauges as practised by my firm.

The Parts of a Gauge.

A pressure gauge as used for this purpose consists essentially of a steel tube of elliptical section bent to the form of a semicircle, one end being screwed to a boss through which the gas under pressure is admitted to the tube, whilst the other end is free to move, being simply closed by means of a brass cap screwed on to the tube. When pressure is admitted to such a tube, the section has a tendency to change from the elliptical to the circular form, and, in consequence of this action, the curvature of the tube is reduced. The tube, in other words, shows a tendency to straighten, causing the free end of the tube to move away from the boss, and the degree of this movement indicates the amount of pressure which has been brought to bear on the tube. The movement is magnified by the aid of a toothed quadrant which is in gear with a pinion carrying a pointer, and the latter indicates the pressure on a graduated scale, the whole being mounted in the manner shown in the illustration. In order to ensure accuracy of indication, it is of primary importance that all the parts of a gauge be fitted up in the nicest possible manner, so as to obtain perfect freedom of movement in the various joints and bearings without the slightest play in the direction of movement. Any such play or back-lash would be magnified by the multiplying gear, and render considerable variations on the scale of the dial. A slight back-lash between the teeth of the quadrant and pinion is, of course, unavoidable, and in all well-made gauges this is taken up by means of a fine spiral hair spring.

The most important part of the gauge is the tube, and the reliability of a gauge depends chiefly upon the choice of the material for the tube, and the care bestowed upon its manufacture and testing. For indicating ordinary boiler pressures of, say, about one hundred pounds per square inch, tubes made of a copper alloy are ordinarily employed; but, for the high pressures which have now become customary in the storage of these gases, gauges with steel tubes are nearly always used. Some gauges are fitted with ordinary drawn steel tubes, but these are vastly inferior to tubes turned out of solid steel which has been specially selected and is suitable for this purpose. The tubes in all gauges manufactured by my firm are bored and turned out of a special brand of Sheffield octagonal or pressed steel, the tubes being made in a very large variety of shapes and strength according to the amount of pressure they are required to register, and the conditions under which they are intended to be worked.

Testing the Tubes.

For the particular purpose with which we are now more immediately concerned, tubes are used which will safely stand a pressure of 360 atmospheres without taking the slightest "set," the diameter of the tubes before being flattened being about one half of an inch, with a wall thickness of nearly one-sixteenth of an inch. After the tubes have been turned, they are polished inside and out, to remove every trace of tool marks, and they are then microscopically examined by light reflected from a mirror, any tube showing marks or scratches being rejected as unfit for use. The tubes are then carefully flattened and bent at a moderate heat, and to perform these operations with entire satisfaction necessitates the greatest experience and skill. Finally, the tubes are hardened and tempered, and a great deal also depends upon the manner in which these operations are performed. The tubes are then again carefully examined, and, if proved satisfactory, they are subjected to a series of tests. For this purpose each tube is temporarily attached to a special testing apparatus, the free end being connected with a mechanism which is identical in all its main features with the works of the gauge which the tube is intended to fit. The tube is then submitted to a pressure of 360 atmospheres for one hour, or longer if possible, and careful note is taken, when the pressure is released, whether the pointer of the facsimile gauge returns to zero. If not, the tube is rejected and destroyed, a strict rule being made never to temper a tube twice, in case the first attempt should not have proved a failure. The bursting strength of a tube successfully completed in this manner will be between seven and eight tons per square inch, or exceeding 1000 atmospheres; but these are by no means the strongest tubes that can be manufactured, and we have produced gauges which indicate regularly and successfully pressures up to thirty tons per square inch, or 4500 atmospheres, being nearly forty times the highest pressure employed in oxygen cylinders. The tube is next attached to the carrier boss, and the cap is screwed on to the free end of the tube, the metallic joint at both ends of the tube being made by means of a sharp-edge projection, which is turned on each end of the tube, and beds itself into the material of the boss and cap. The multiplying mechanism is next fitted up, the several parts being made beforehand in large quantities and by special machinery. The gauge is then secured in its case, whereupon it is again attached to a test pump. The multiplying mechanism is now adjusted, so as to give the required range of movement to the pointer, and, the dial having been temporarily inserted, the scale is marked out point for point by comparison with two large standard test gauges, which are periodically tested upon a dead-weight frictionless testing machine specially constructed for this purpose. Each dial is written by hand, and is subsequently inserted into its gauge and secured by means of three screws. The pointer is then fastened to the pinion spindle, the gauge is completed, and submitted to another final test upon the hydraulic test pump. A gauge made in this manner, will, if fairly used, permanently indicate on the dial any pressure with extreme accuracy, and may be kept under constant pressure without liability to deterioration.

Tests for Defective Gauges.

There are, however, a large number of gauges in use which do not comply with these essential requirements, some specimens placed upon the market being, indeed, very inferior in construction and workmanship; and, as there is little to distinguish these gauges in external

appearance from efficient instruments, it may be useful to indicate a few simple tests by which the grossest faults, at any rate, can be discovered by any one. For this purpose it is only necessary to remove the brass rim and glass, and to fix the gauge upon a gas cylinder charged to the full pressure of 120 atmospheres. Before opening the valve, lift the pointer over the pin against which it rests, when there is no pressure on the gauge. By means of a pencil, mark upon the dial the exact spot where the pointer settles; then lift the pointer back and open the valve. After leaving the gauge under pressure for, say, a quarter of an hour, or, better still, half an hour, close the valve, release the pressure, and, after again lifting the pointer over the rest pin, observe whether the pointer comes back to the exact position which it occupied before. If there is a perceptible variation the tube has given way, and this forms conclusive evidence that the gauge cannot be relied upon. A more rigorous test consists in making the same experiment under the maximum pressure to which the gauge is marked, say, to 250 atmospheres, or even to a pressure exceeding this, and any well-made gauge will easily stand the test.

The above tests, which any lanternist may perform, will suffice to bring to light the worst defects. When the gauge is under pressure the pointer should be gently moved both ways, and it should be observed whether it invariably returns to precisely the same indication. Any variation would be the result of back-lash or sticking, and points to inferior workmanship.

Some Dangers.

Having, then, become acquainted with the construction and working of these gauges, we will next consider the dangers connected with the use of these instruments for high-pressure oxygen and hydrogen, or coal-gas cylinders, and at the outset we must distinguish clearly between explosions, which are the result of bursting of the tube, and chemical explosions, which are due to the firing of inflammable matter in the tube or connexions of the gauge. By far the largest number of accidents which have hitherto occurred are the result of *chemical* action; but some of them must undoubtedly be attributed to a simple bursting of the tube, due either to bad construction or to a defect in the material of the tube. In some cases the tubes have been turned out round, or have been insufficiently flattened, and, in order to obtain sufficient sensitiveness, makers have reduced the thickness of the tube to such an extent, that it has sooner or later burst from sheer weakness. In such instances, the sudden rush of gas under the enormous pressure into the *gauge* body instantly puts the case under a pressure which it is not calculated to stand, and a violent explosion is the result, in which the *case* is generally shattered whilst the interior of the gauge may be left fairly intact. An accident of this nature is not likely to occur with a well-made gauge; but, as even the best tubes may in the course of years develop defects which could by no possibility have been discovered in manufacture, it is, nevertheless, advisable to provide every gauge with a protection against accidents of this nature. For this purpose the best safeguard consists in fitting the gauge case with openings, or other free vent, combined with a check in the inlet to the gauge. The latter will prevent the sudden admission of pressure to the gauge, and any pressure which might otherwise slowly accumulate in the gauge case will be relieved by the vents in the case.

In all gauges manufactured by my firm during the last year, or thereabouts, the vent has taken the form of a loose hinged back or valve, which is held closed by means of a light spring. If even a very light pressure is admitted to the case, this valve will be forced open, and the pressure is then instantly relieved. The entire efficiency of this safeguard has been experimentally demonstrated.

The investigation of the second and more important class of accidents which are attributable to chemical explosion is not quite so simple, but the general causes are well understood. They are produced by the ignition of oil or other inflammable matter in the tube, the heat necessary to effect the ignition being the result of the sudden compression of the air or other gas in the gauge tube and connexions. When the valve of a cylinder charged to 120 atmospheres is suddenly opened, the whole of the contents of the connexions to the regulator and gauge are instantly compressed to the 120th part of their former volume into the most distant parts of the internal passages, such as the extreme end of the gauge tube; setting aside the effect which the mixing of the gases will have, the action is similar to what would occur if the contents were compressed by a piston. In this way, sufficient heat is set free to raise the temperature of the compressed body of air or other contents to a considerable degree of temperature; and this will suffice to ignite any highly inflammable matter that may have lodged in the extreme end of the tube or connexion.

This may be easily and safely demonstrated by a simple experiment. A straight tube, say, six or seven inches in length—one end of which is closed by means of a cap, into which a piece of tinder or other similarly inflammable matter is secured—is attached to a cylinder containing air compressed to, say, 120 atmospheres. By suddenly opening the valve, sufficient heat will be set free to ignite the tinder. I have even successfully performed this experiment with a tube only four and a half inches long, and with a pressure of barely eighty atmospheres. Mr. Whitefield (Vice-President of the Manchester Photographic Society) has kindly conducted an experiment for me, with the object of determining the temperature of ignition of the tinder used in this experiment; and he finds that this is about 410° Fahr., which, I think, is about the same as the firing temperature of an explosive mixture of hydrogen and oxygen. If such ignition can be produced in the presence of air only, how much more likely may this not be in an atmosphere of oxygen! Let us now suppose that traces of oil have been left in the gauge by the maker, or that oil which has been used for lubricating the valve of the cylinder, or other purpose has been blown into the gauge tube during an admission of gas. If such a gauge is applied to an oxygen cylinder immediately after use on a hydrogen cylinder, and the valve is opened suddenly, the heat set free will be sufficient to fire the mixture of oxygen and hydrogen in the end of the tube, and this, in turn, will ignite the oil in the tube, with the result that a violent explosion will occur, owing to the rapidity and intensity with which the oil is consumed in the presence of oxygen; but, even without having hydrogen present, the heat evolved by a sudden opening of the valve may be sufficient to ignite directly any oil that has gained access to the tube. Possibly some of the oil might be carried forward by the in-rushing gas in the form of spray; and, in an atmosphere of oxygen, this would probably ignite at a comparatively low temperature. The temperature of any oil in the tube may even be materially increased by friction resulting from the in-rushing gas; or the particles of oil, carried forward with great violence, might become heated by friction against the sides of the tube and by the sudden impact with the end of the passage; and all these circumstances would increase the danger of explosion.

Oil not Used—The "Jackson" Check.

Since the danger of the presence of oil in these gauge tubes has come to be realised, we have discontinued the practice of using oil for dividing and testing these gauges, pumps filled with water having been adopted instead; and the greatest care is exercised to prevent any oil from coming into contact with the gauge fittings during manufacture. Special water pumps are now set aside purposely for this work, and the connexions are so arranged that it is impossible for any workman to screw the gauges on to an oil pump without providing himself with a special connexion for this purpose—all chances of a mistake being thus overcome. The pumps themselves are fed from the town's main, and, after each test, the contents of the pumps are discharged into a white enamelled trough, in which any traces of oil can easily be detected. Subsequently, the contents of the tube are extracted by means of a vacuum pump, and are examined for oil. Finally, the remnants are blown out by admitting air pressure to the gauge at 100 or 120 atmospheres, and suddenly releasing this pressure. In this manner, everything that human foresight can provide is done to minimise the chances of the tube containing, when completed, even the slightest traces of oil. But, in spite of every care, the entire absence of oil or other inflammable matter cannot be absolutely assured; and, even if this were done, there always remains the danger of oil gaining access to the tube accidentally when a gauge is in use. Therefore, whilst continuing to exercise every care to keep away all traces of oil, the ultimate safeguard against accidents of this description must be looked for in another direction, namely, by checking the sudden in-rush of gas to the gauge when opening the valve, so that the pressure in the gauge rises gradually, and the heat evolved has time to be absorbed by the material of the gauge tube. This may be accomplished by opening the valve very gently; but, as this gentleness cannot always be ensured, owing to the frequent stiffness of the valves, carelessness, and want of skill, it is indispensable, in order to secure perfect safety, to fit each gauge with some means for automatically checking the admission; and, whatever check is employed for this purpose, it must not require any particular attention or manipulation. Various devices have been brought out for this purpose; but, of all that have come within the limit of my experience, the check patented by Mr. W. M. Jackson, of the Manchester Oxygen Company, is by far the simplest and best. This consists in screwing a plug, through the centre of which a fine hole has been drilled, into the foot of the connecting shank of the gauge. Upon this plug are placed a number of alternate layers of copper wire gauze and felt cloth, in the manner shown in the illustration. Another screwed plug, similarly drilled with a fine hole, is then added, and the alternate layers of gauze and felt are compressed between the plugs. This packing retards the pressure of the gas, even when suddenly turned on; but it does not prevent the ultimate admission of full pressure to the gauge.

Conditions of Absolute Safety.

I am of opinion that absolute immunity from danger of chemical explosions in gauges can be ensured by the proper use of this check, and it is not too much to say that no gauge used for this purpose should be without it or some equivalent device which has proved satisfactory. If a pressure gauge is of sound construction and well made, and fitted with the adjuncts which I have described, and these are kept in proper working order, it may, I think, be accepted that such an instrument is absolutely safe, and there need be no fear of any accident from known causes. The experiment which I have performed before you suggests, however, that even without the use of a pressure gauge an explosion in the connexions is possible, provided the end of the passages in the connexion is sealed and the pressure suddenly admitted. Generally speaking, the regulator valve is full open when the cylinder valve is being opened, and there is, then, little danger of heating in the regulator connexion; but circumstances might arise in which pressure is suddenly admitted with the regulator valve closed, and here the conditions are precisely similar to those which exist in the cases of gauge chemical explosions. This might, for instance, occur if the valve is opened twice in succession, the first opening having been sufficient to set the regulator to work.

If the pressure is then released and readmitted suddenly, an ignition might occur in the regulator connexion. It appears to me that the same thing might happen in using a cylinder valve which is not quite true, and which is worn to an oval shape in the seating. If such a valve is opened, a puff of oxygen sufficient to fill the regulator might be passed, followed by a temporary closing, whereupon a sudden opening might produce in the regulator connexion the precise conditions for an explosion. These considerations suggest the theory that some of the explosions which have been attributed to pressure gauges have probably originated in the connexion of the regulator itself. The danger under consideration can be minimised by making the connexion to the regulator as short as possible; and, generally speaking, long passages of any kind between the cylinder valve and the regulator or gauge should be rigorously avoided, as constituting a decided source of danger; and, wherever it is necessary to have a long passage, the end of which is or may become sealed, a check should be provided.

If lanternists would only devote their attention to these points, and assure themselves that the principles here laid down are carefully carried out, we shall have no more explosions; and my labour in preparing this paper will have been amply awarded if it should have the effect of arousing the members of this Society, and through their medium other lanternists to the importance, of carefully studying this subject.

C. F. Budenberg.

ON THINGS IN GENERAL.

If the editor does not think it will be reopening the closed discussion on Perspective, I should like to say that I, too, passed the South Kensington examination in Linear Perspective (among others) a score of years ago, and that I then obtained a certificate qualifying me to teach that and other subjects.

Those who were not at the meeting of the London and Provincial Photographic Association on the last day of the old year should read the published account of it. There will be found a real kernel of valuable information upon matters connected with the fading of photographs—information which is not all available in such a concise form in any work hitherto published. Something was said about the fading of bromide prints. I confess to being no lover of such prints, but I would have fair play dealt out. Now we all know "one swallow does not make a summer," neither does one faded print damn a process. As good a story as can possibly be told about this question is rapidly being put together. Whether out of his supreme wisdom with such an object in view, or by a matter of chance, it will be observed that Mr. Traill Taylor, in his editorial capacity, has for some years past chosen the bromide process as the medium for producing the illustrations to The British Journal Photographic Almanac. Before many years are over there will be hundreds of thousands of witnesses as to the possibilities of bromides in the direction of fading or non-fading. Let every one carefully preserve his Almanacs for this purpose alone is the advice of

Free Lance.

THE PRICE OF SILVER.

On Wednesday last bar silver declined to 41⅛*d.* per ounce, the lowest price touched since the year 1888.

PRESSURE GAUGES.*

A word upon the oil question and testing. In the process of making steel tubes, when duly shaped they are heated and carefully tempered in oil, after the fashion of tempering the famous old Toledo sword blades, which were not perfect unless they became straight after the point had touched the hilt. The oil is burnt off in the process. After that, when the time for testing arrives, the tube is attached to a dial plate and filled with water, every dial plate being graduated for its own tube under actual known pressure; but neither water nor oil should be allowed to remain in a tube, and the method of clearing I saw was to fill the tube before inserting the safety check with high-pressure gas. This was allowed to escape suddenly, when it carried out most unmistakably whatever traces of moisture there were in it. This was repeated to ensure perfect dryness. No oil is used in testing, but water only, which is fed into the pump in Messrs. Schaeffer & Budenberg's testing room from a vertical glass receiver placed in a good light on a level with the eyes of the workman, so that any impurity can be seen at once before passing into the pump, and when I chanced to call the water was clear and bright.

I was informed that at their factory in Germany, where the steel tubes are made, the water used is taken direct from the town supply, and, after passing out of the steel tube, is ejected into a white enamelled receiver for careful examination to discover the slightest trace of oily matter. This indicates the scrupulous care taken in this detail of manufacture. But

> "The best laid schemes of mice and men
> Gang aft a-gley."

And suppose that notwithstanding check valve and care of all kinds, a flaw develops in the steel, finest of its kind though it be, and the tube does burst—what then?

If a tube should so burst, the surrounding case is strong enough to prevent it flying out, the case itself only bursts when filled with the high-pressure gas; to anticipate and prevent any such evil, which, by the way, has not yet occurred with a turned steel tube and check valve, a shutter has been placed at the back of the gauge, closed by a light spring, but which opens readily with a little internal pressure, and thereby would allow any gas to escape harmlessly and prevent its breaking the glass.

In such a gauge all evil seems to be completely forestalled and guarded against, but doubtless, if any one will suggest any other source of inconvenience, I need not say danger, some remedy or safeguard can be provided.

I should like now to give you a hint as to testing your own gauges for efficiency. The entire principle of gauges of this type depends on the elasticity of the metal employed in the tube; if too soft or badly tempered, or of unsuitable quality, it will become set and not return to its original shape after being subjected to a high pressure, and frequent repeated strain will increase the discrepancy shown on the dial; therefore the needle should always return to zero promptly when the gauge is emptied, and when it is repeatedly applied to a full bottle at the same pressure, at each trial it should register exactly the same. Well, all gauges ought to do that, but unfortunately they do not; therefore look to it as an indication of a fault somewhere. The needle should be lifted over the zero pin and a mark made on the dial at the point where it rests stationary, then put it back over the pin and apply your pressure test; don't be in a hurry with the test, let the tube remain fitted at the highest pressure for, say, a quarter of an hour, then take off the pressure, gently lift the needle once more over the zero pin, and observe if it returns to the mark; if not, there is a "set" in the tube. If you are a malicious person—I am not looking at any one—no doubt you will sell that gauge to your enemy.

There is another fault met with in a gauge made by a bad workman, or in one of the "too-cheap" sort, that is the back lash caused by loose-fitting pivots and bad rackwork. I had a gauge in my hand a little while ago in which the pitch of the rack and of the pinion were different, yet the exterior of the gauge would not be objected to by most purchasers. A moderate amount of back lash allows of an error on the dial of five to ten atmospheres, important to those who are using up all the contents of a cylinder and want to know how long it will last. To check this fault, pull the needle over first on one side a little and then to the other side a little, and see if in both instances it returns *exactly* to the starting point; if not, it is faulty in action, and also indicates low-class workmanship.

A lanternist is much better without a gauge than with one that does not register correctly, or is made of bad material or with bad workmanship.

There are other forms of gauges made or in use; one that depends on the direct action of an issuing current of gas on a spiral spring

* Concluded from page 58.

arranged something like a common spring letter-balance. Another acts on a piston in a tube, the piston being forced back against a spring with an index attached to it. These seem to me to be liable to irregularity in action, and, from their diminutive size, not capable of reasonable correctness.

I should not like to stand before one in use, lest a shot from the piston reminded me of the traditional little volunteer who went home without his ramrod after an evening's practice at the butts. The thing may be all right and strong, but to me it looks rather fragile. I have had no experience with it.

I have had bottles said to contain the same quantities; the gauge showed they contained the same number of atmospheres, but their external dimensions were very different. How can the right quantity be ascertained? If you have hired a bottle, you can only rely on the maker's good faith until you have emptied it; it is then a case of "locking the stable door after the horse is stolen." But you may prove your case, and for any cylinder you purchase you should do so, by weighing it when full at 120 atmos. (or any other known pressure), and again when empty. In the case of oxygen, the net weight will show the number of cubic feet, if the ounces are divided by 1·43, as one cubic foot of oxygen weighs 1·43 ounce. Coal gas is much lighter—say half ounce per foot—and needs more careful weighing; but, as it is only on special occasions, for proof purposes, such trouble would be taken to weigh accurately, and few persons have access to scales that will balance twenty or thirty pounds accurately, a gauge is practically a necessity for a lanternist, whatever may be said by some people whose nervousness has over-balanced their common sense for a time.

When your cylinders and gauges are checked, and proved to be of sound, high-class workmanship, they may be relied upon without fear as good servants; but oil and carelessness should be avoided in their use, lest they become bad masters. H. M. Whitefield.

ISOCHROMATIC PHOTOGRAPHY.

[A Paper read before the Holborn Camera Club.]

In discussing the comparative merits of photography and drawing as delineators of nature, an unthinking mind would doubtless award the palm of accuracy to photography. Those who know most of photography will, with regret, be the most ready to acknowledge the untruth of such a decision. Our tools limit our capacity to an extraordinary degree, and it does not take a student of photography long to discover wherein lie its defects. Lenses too often give untruthful form, whilst plates translate colour erroneously. Both faults are capable of some degree of correction, and some few practical ideas on the question of colour correctness may advantageously be considered to-night.

Isochromatic photography has had many champions and many opponents, but few are brave enough to say to-day that it is not one of the most important strides that photography has made recently. It may, of course, be readily admitted that we have not as yet reached anything like perfection, but it is the initial step in the right direction, and, like the child who begins to walk, having once started off, may hope to rapidly acquire power to take further strides, until our progress is fully developed.

The eye looking at these coloured papers sees, apart from the colour itself, certain intensities of light reflections, and judges that the blue is the darkest, the yellow the lightest, photograph these with an ordinary plate, and we have these intensities reversed. The sensitive film is more impressed by the blue rays and less by the yellow, and a print from a negative of such a colour scheme gives yellow as almost black, and blue as almost white, with gradations of difference in the intermediate colours.

Probably every owner of a camera has experienced the almost inevitable disappointment which marks his earliest efforts in landscape work. He sees on his ground glass a picture full of all that goes to make a picture, and this transcript lacks too often all those qualities. It is not that this photograph lacks colour (that he would expect), but it is the fact that it lacks true translation of colour into monochrome, that robs the view of its value. We may say that correct exposure and correct development alone give true gradation; but this is only half the truth, and we lack a still further requisite in colour-correct plates. Take a very common subject—for we all take our cameras to the seaside—sea, sky, and yellow sands. A photograph of such a subject is usually as flat and unreal as it can be; all the three divisions of our subject are rendered as if all one or nearly so, and any difference there may be is in the wrong place, sky may be a patch of white, and sand a dull, dark mass of uniformity. Looking from the scene to its transcript, you see these colour values exactly reversed. Hence are seascapes, unless enlivened by scudding clouds, breaking waves, or passing vessels, usually so tame and monotonous, and so unlike the reality.

Crookes', Vogel's, and Tailfer's Work.

Professor Crookes many long years ago found this photographic disability, and took the first step to remove it, by suggesting the use of a screen of light yellow glass, which depressed the blue rays and allowed the yellow to have greater effect on the plate. This was the first step towards what is now known as isochromatic photography. Many an old photographer has been an unconscious supporter of this principle when he has expressed his affection for an old lens which he has had in use for many years, the truth of the matter being that either the glass on the balsam, with which the combinations were cemented, or both, had become slightly yellowed by age, and gave him an improved rendering of his subject; but this was only less than half the battle, and, until plates were more sensitive to the rays at the other end of the spectrum, it was impossible to say that any approach to perfect colour-correct translation was obtained. Dr. Vogel is undoubtedly entitled to the credit of making the first suggestions and experiments with what may best be termed selective sensitisers; and, although his experiments were founded on wrong hypotheses, his methods were right. He was under the impression that dyeing the film was the only requisite; but it is manifest, in the light of our present knowledge, that this was only another method of using a yellow screen. The dye was more than that, and in fact altered, the colour sensitiveness of the silver salt. Dr. Vogel's experiments were made with collodion, and whatever was done in the same direction, if anything at all was attempted, with gelatine plates, was found absolutely ineffective until Tailfer took the matter in hand, and after years of elaborate experiments brought out his process, which forms the essence of the present-day system of isochromatic photography, as recognised now throughout the whole world.

Every attempt that ingenuity and money could suggest has been made to get behind his patent, but without avail. England, France, Germany, and America have all purchased his rights, and the only isochromatic plates that are made in the world to any practical extent are made under licence from him. Although, for over eight years now, the world of experimentalists have been at work trying all the dyes that recent researches have rendered available, every one has been forced to admit that the eosine group is not only the best, but the only one that will give practical and commercial results; and, further, that without the aid of ammonia even those eosine dyes are useless for practical work. No better proof of the stability of Tailfer's claims to priority and perfection could be given than this eight years of constant but unavailing endeavours on the part of scientific and practical men to upset his claims.

Practical Tests.

I may say that, in common with many others, I had a certain scepticism of the advantages of isochromatic methods until about a year ago, when, in an idle moment, I undertook to test the thing for myself. My first experiment convinced me of my error, and I propose to repeat that experiment to-night, as it seems to me the most conclusive argument that could be used in support of the advantages obtained by the use of "colour-correct" plates. This crucial experiment may be instructively extended, and in no direction more advantageously than in the combination of isochromatic plates with the use of yellow screens.

Such a scene as the seascape I have imagined, landscapes, with evening or morning light, where yellow tint prevails, views with hazy distance, and other similar conditions, render screens entirely unnecessary; but where we have ordinary landscapes, practically bathed in nothing but white light, then a light and correct screen is necessary. Even if there is a good deal of yellow or green in the subject, it will be so subdued by the flood of white light reflected from the surface of the various objects, that their intrinsic colours will have but little value to effect the plate. Screens, then, have their legitimate, and, we may even say necessary, use, for they serve to depress the blue rays without affecting the greens and yellows. In the experiment just carried out, it will have been seen that an isochromatic plate is more fully sensitive to the green and yellow rays, and less so to the blue, than the ordinary plate, whilst even in the red there is a slight advantage, for we see the isochromatic plate has a little detail where exposed under the ruby glass. We easily see from this how necessary it is for a proper and safe light to be used for our dark-room illumination. Yellow light is clearly quite unsuitable, and, even when we come to ruby, we must be careful to have a good ruby, and not too much light behind it.

Another example of the difference between ordinary and isochromatic plates may be further evidence of the advantages of the latter. Taking some slips of coloured paper arranged thus—orange, light yellow, dark yellow, light blue, dark blue—we find with an ordinary plate that the dark yellow and dark blue are rendered equally intense; the light blue is practically white, whilst the orange is made to appear lighter than the yellow. A print which I show will exhibit the falsity clearly.

The Yellow Screen.

Now, taking the same subject on an isochromatic plate, we have a much-improved result, the various intensities are more truly rendered, and when we examine the same subject, taken with a light yellow screen, we get absolute truth. It is apparent that we can go on increasing the depth of the screen, and get over correction, until the blues become too dark and the yellow quite white. It is of the utmost importance, therefore, to be sure that a screen of proper tint is used, where we do use one at all, and I may say that we shall take all responsibility off your shoulders in this matter, and supply such screens as will be just correct for the purpose, and no more. They will be of two shades; the lighter will need the exposure prolonged for two and a half times, the darker for five or six times. In order to avoid the necessity and expense of having a separate screen for each lens, they will be of such form that they can be

used for any lens. This is effected by using them in a specially designed simple frame behind the lens, so that the screen can be slipped in readily, and exposures made without trouble. This simplification will do away with one of the troubles attending the use of screens, and it will be as easy to take pictures with as without them. Of course, an extension of the time of exposure will be necessary, but, when we count our usual exposures by fractions of a second, twice or three times that will not be appreciably felt.

Another point about screens is this, they must be optically worked and free from flaws, otherwise we shall have distortion. It is quite plain, if the glass is wedge-shaped, that the rays will be interfered with; and, if the glass is either concave or convex, it will form a lens and interfere with the focus. It is wonderful how small a defect of this sort will throw the focus out to the extent of a quarter of an inch. If the screen has sides that are absolutely parallel, then we need not fear any danger. Even if the glass is not exactly parallel to the lens, no harm will be done beyond shifting more or less of the image out of the field, according to the angle at which the screen is inclined.

It will be seen, then, that the advantages of isochromatic plates under almost all circumstances are considerable, and, in many cases, they are incalculable. In dull weather, as in autumn or winter, the sensitiveness of isochromatic plates to yellow, greens, and orange gives them very considerable advantage over ordinary plates, both for outdoor and studio work, and enables shorter exposures to be given with improved truth of result.

In photo-micrography, in copying, in taking snow scenes, and in other special work, no other plates are permissible; and there is one other branch of photography that has made immense strides owing to these plates—I mean the photography of cloudland. The inherent difficulty of truthfully rendering the blues and whites has been a bar to progress, but with isochromatic plates all this is altered, and clouds are as easy to portray as any other subject. Still another point of advantage, found with isochromatic plates, is the greater freedom from halation.

Enough has been said to prove that "colour correctness" in plates is both a decided step forward in the art-science of photography, and a matter that is well within our reach without trouble or difficulty.

JOHN HOWSON.

Our Editorial Table.

THE "PHOTOGRAPHIC REVIEW OF REVIEWS."—No. 1.

Iliffe & Son, St. Bride Street, E.C.

THE new venture of Mr. Walter D. Welford reflects credit upon him for its neat *ensemble*. Its style might almost be deduced from its title. He selects the chief topics of the month from the various journals, and adds a few comments of his own, writing throughout in the first person singular. In a personal note Mr. Welford explains that he throws overboard the editorial "we," in order that the responsibility for the assertions made and opinions expressed may rest on himself or the writer. We learn that his connexion with journalism dates back to 1878. The "Review" contains several illustrations of hand-camera work, and other subjects.

SUTER'S CATALOGUE OF THE CARL ZEISS PATENT PHOTOGRAPHIC OBJECTIVES.

FROM Mr. J. R. Gotz, 19, Buckingham-street, Strand, we have received Herr Suter's new catalogue, and have also been privileged to examine several of the lenses catalogued. They cannot fail in proving useful, on account of their good definition and covering power, even with a large diaphragm.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 525.—"A Machine for Pasting, Mounting, and Performing the Various Processes in Finishing Photographs." J. WILKINSON.—*Dated January* 11, 1892.

No. 625.—"Improvements in or Relating to Roll-holders for Photographic Films." Communicated by F. A. Brownell. A. J. BOULT.—*Dated January* 12, 1892.

No. 667.—"An Improved Method of Preparing Photo-mechanical Printing and other Surfaces." J. POFFL.—*Dated January* 13, 1892.

No. 716.—"Improvements in Photographic Cameras." J. T. PRIDE.—*Dated January* 13, 1892.

No. 851.—"Improvements in Instantaneous Shutters for Photographic Cameras." E. LACY.—*Dated January* 15, 1892.

No. 865.—"Improvements in Clamps or Clips for Use in Photographic Copying Processes." Communicated by A. Delug. W. P. THOMPSON.—*Dated January* 15, 1892.

No. 903.—"Improved Photographic Apparatus." Complete specification. F. SANDEMAN.—*Dated January* 16, 1892.

No. 917.—"Improvements in Photographic Cameras." A. D. SACKETT.—*Dated January* 16, 1892.

PATENTS COMPLETED.

IMPROVEMENTS IN PHOTOGRAPHIC DEVELOPING TENTS AND CHANGING BAGS.

No. 20,864. WILLIAM RITCHIE BAKER, 9, Belmont-villas, Wallington, Surrey.—*December* 5, 1891.

MY invention consists of a shallow box of any convenient size, which is lined with waterproof material and fitted for use as a sink, water supply and drain pipes being attached if required. This is also provided with a stage or table of vulcanite of about the width of the sink, and of sufficient breadth at the top to prevent any liquid spilt upon it dripping into a fixing or other bath kept beneath.

The sides of the box are rather thick, so that a groove of about a quarter of inch wide by a half an inch deep can be sunk in their substance, which will contain a square of stout wire. The lid is formed of two doors, which open on either side, and have the outer ends supported by short legs, which let down when required. Two other squares of wire are made, but smaller than the first mentioned, so that they will lie in the tray when the apparatus is packed up. They are provided with feet, so that they can be fixed in an upright position at each end of the open doors.

A cover is now made of suitable non-actinic material, which will be fastened to, and kept extended by, these frames, and form a kind of waggon-head shaped enclosure, which will fold up and go into the box when not in use.

The middle parts of the long sides are fixed to two of the sides of the iron frame in the groove, and to the other sides of this, pieces of material are fastened, which extend to the bottom of the frames at the ends of the doors. White light is thus excluded, but the sink in the centre can be freely used.

At the bottom of one side the material of the bottom and sides is not joined, but is continued for about half a yard, so as to form a kind of sleeve, by means of which articles can be passed into or from the tent, without admitting light, if one end is closed before the other is opened.

In order to see within I make an opening just large enough to admit the eyes, and over this I attach a band with a corresponding opening, that fits closely to the face and fastens behind the head. Suitable sleeves are made for the hands, and covers are provided both for them and the eye-opening, so that the tent can be left and returned to without letting in the light.

When the sides are formed of more than one thickness of material, the inner ones can be arranged as curtains, so that the light may be regulated.

A head rest may also be provided if found necessary.

I do not confine myself to the materials or shapes mentioned in the above description, but would adopt any that would be most suitable for the purpose, and to secure greater portability when only a tent to change plates, and not to develop in, was required, would do away with the sink and box altogether.

IMPROVEMENTS IN PHOTOGRAPHIC PRINTING FRAMES.

No. 2934.—CHARLES CLOAKLY, 13, Northumberland-place, Bath, Somersetshire.—*December* 12, 1891.

AN improvement in the construction of printing frames used by photographers, consisting in the use of metal pins or wooden dowels, with or without metal plates, the object in using the said metal pins, plates, or dowels being to prevent the shifting of the photographic print during examination.

I also claim for the blackboards used to the said frames to be of two or more thicknesses of wood, the said wood to be glued or cemented crossways to prevent warping.

Claims:—1. The use of wood dowels or metal pins fitting into corresponding holes, with or without metal plates, the object being to prevent the photographic print from shifting during examination, as substantially before described. 2. The blackboards to be of two or more thicknesses, glued or cemented together, the object being to prevent warping, as substantially before described.

IMPROVEMENTS IN PHOTOGRAPHIC "SHEATHS" OR "CARRIERS."

No. 20,299. ARTHUR SAMUEL NEWMAN, 71, Farringdon-road, London, Middlesex, and ARTHUR LEWIS ADAMS, 81, Aldersgate-street, City of London.—*December* 12, 1891.

THIS invention relates to the carriers or sheaths used for holding and protecting the plates, films, or other surfaces for photographic purposes, both before, during, and after exposure, and my present improvements will be found especially advantageous for use with "automatic" cameras, and with changing boxes of all kinds.

For this purpose we arrange and construct a photographic "sheath" or "carrier" as follows:—

The top and bottom edges are turned over so as to embrace and hold the top and bottom of the plate, &c., and at each end neither edge thereof is turned up, but has a "set-back," or swelling on its back, formed thereon or therein in such a manner that it projects beyond the plane of the back of the sheath, and therefore the next plate, &c., behind same is thereby prevented from elsewhere coming in contact with such sheath, except at the extreme edge of each end.

If desired, the "set-back" may be formed in or on the top and bottom, and the two sides have their edges turned over, thus arranging the sheath *vice versâ*.

The sheath or carrier may be made of very thin sheet metal, or of any other suitable material or substance, and in place of the aforesaid "set-back" being formed out of the body of the sheath, it may be formed by attaching a separate piece—the same effect being obtained, and having the great advantage of having each side (or top and bottom, as the case may be) open, and thus allowing easy withdrawal or insertion of the plate, &c.; and also our present invention has this further advantage, that it can thus be made very light in weight, while at the same time having great strength, by reason of the two edges turned over in front, and the "set-back," or swelling on the back.

We further wish to remark that in some cases the "set-back" or swellings may also be formed on the back of the sheath, along the same edges as the turned-over edges, and the "set-back" or swellings on the two open sides dispensed with, or such "set-back" or swellings may be used on all four edges if desired.

Improved Means or Apparatus for Producing Artificial Light for Photographic and other Purposes.

(Communicated by Paul Nadar, 51, Rue d'Anjou, Paris, France.)

No. 3042. James Yate Johnson, 47, Lincoln's Inn Fields, Middlesex.—*December* 19, 1891.

This invention relates to the production of an intense white light suitable for photographic and other purposes for which a powerful light is required, as hereinafter described.

The art of photography would be capable of greatly enlarging the sphere of its operation as far as the production of negatives by the instantaneous process is concerned, and would be enabled to render novel and important services if means were provided for readily obtaining, at a given moment, a light sufficiently permanent and intense to enable it to be employed in place of the irregular and uncertain light of the sun.

Attempts have been made to employ magnesium for the purpose of producing a light of this description, but the apparatus heretofore employed with this object has failed to give satisfactory results. Lamps in which a coil of magnesium wire or ribbon is fed forward by clockwork or by hand are uncertain in their action, owing to the practical impossibility of accurately regulating the feed in accordance with the rate of combustion of the wire or ribbon, and present other disadvantages which form an obstacle to their successful employment.

In the "Helionocte," or apparatus arranged according to this invention, as hereinafter described, these disadvantages are obviated, and by causing a jet of air to throw finely pulverised magnesium into a flame, either intermittently or in a continuous manner, a very intense or powerful light is produced, which may be in the form of a flash or be maintained for any required period.

Any suitable flame may be employed to produce the combustion of the magnesium carried into the flame by the jet of air. In an apparatus in which the flame is produced by a spirit lamp, for example, a burner with a tubular wick is employed, and the receptacle for the spirit, which may be provided with a gauge-glass to show the level of the spirit, is placed upon a receptacle or chamber containing pulverised magnesium. In the bottom of this chamber, which may be removable, there is placed a nozzle communicating with a tube, through which air under pressure is supplied by a rubber pear with an elastic tube for regulating the pressure, or any other source of compressed air. Immediately above this nozzle is a short vertical tube, sliding telescopically upon a fixed tube extending into the central tube of the burner, where it is provided with another short adjustable or sliding tube. The space around the tube in the chamber or receptacle for the magnesium is charged with magnesium, and the jet of air from the nozzle in the bottom of the chamber draws in a quantity of the powder through the annular opening formed between the nozzle and the extremity of the lower adjustable tube, and carries it up the tube, discharging it at the upper extremity in the centre of the flame of the spirit lamp. The heat of this flame produces the combustion of the particles of magnesium suspended in the air, and a brilliant light is obtained. A trough containing water is placed at the bottom of the central wick tube (which extends through the spirit chamber) for the reception and extinction of any burning particles that may fall down the annular space between this tube and the central air tube. A removable plug below the nozzle enables the tube to be cleared if required, and arrangements may be made for charging the magnesium chamber with spirit chamber automatically or otherwise, and without interrupting the action of the apparatus. The quantity of magnesium thrown into the flame may be regulated by means of a screw plug or valve in the nozzle, or by varying the aperture of the nozzle. When this aperture is enlarged the space between the nozzle and the extremity of the tube should be diminished, and vice versâ.

The spirit lamp may be provided with legs engaging with corresponding sockets at the top of the magnesium chamber, or it may be constructed with a clamp pressed at the lower part to admit air to the flame, and arranged to screw on to the top of the box or chamber containing the magnesium. The air tube may be provided with a suitable cock or valve for shutting off or regulating the supply of air.

The flame may be produced by the combustion of gas, for example supplied by an ordinary burner, or a ring of burners, or a series of jets, in a chamber provided with a suitable air supply. These gas jets are situated under the lower extremities of vertical tubes passing through the top of the chamber. The products of gas and air combustion flow before it is delivered to the main tube at the point where the stream of air carrying the magnesium is delivered to the main tube at the point where. A plug burner may be employed to ignite the gas.

These arrangements may especially be employed to produce "searchlights," by causing the magnesium to be thrown into the flame intermittently or continuously, and may be combined with any suitable arrangement of reflectors.

In order to obtain a shorter and more concentrated flame, I prefer to surround the apparatus with a funnel or chimney, carried by a vertically adjustable tank plate, connected to a horizontal plate or table, forming the base of the apparatus. A rack-bar is attached to the back of the tank, and acts as the support to a vertical plate, preferably of steel, having its lower part bent forwards, so as to form a shelf in horizontal flange. Beneath the spirit vessel is a water trough to catch the sparks, and below this is fixed to the said vessel is a receptacle for gunpowder, provided with suitable arrangements for producing a flash or explosion at any time, with regulable or intermittent action, for the flame of the spirit lamp. The flame is blown back by the current of air and incandescent matter into the pile of the tank, being prevented from spreading outwards by the overhanging flange.

In place of the magnesium, any other material capable of producing the effect hereinbefore described may be employed, and any suitable gas or liquid may be employed in place of the air for carrying the said magnesium or other material. Oxygen gas and hydrogen gas may be employed, for example, in an apparatus arranged according to this invention.

An Improved Photographic Vignetting Attachment.

(Communicated by Amos J. Lamborn, William Nuneviller, and William Koebler, jun., all of Philadelphia, in the State of Pennsylvania, United States of America.)

No. 19,767. William Wilson Horn, 151, Strand, Middlesex.—*December* 19, 1891.

This my invention relates to an improved photographic vignetting attachment, and my invention consists in forming a vignetting attachment of *papier maché*, paper-pulp, or other plastic material, moulded or pressed into shape, making a light, cheap, and durable article.

It also consists in setting out the face of the attachment so that increased strength is obtained, and the light may be diffused to a greater extent, and the vignette thereby made softer.

As the attachment is formed by pressing, stamping, or moulding, it is cheaper and lighter than heretofore, and possesses increased strength.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—1. A vignetting attachment for photographic printing frames, formed of plastic material, having its face set out, said face portion being integral with the attachment, substantially as described. 2. A vignetting attachment for a photographic printing frame, formed of plastic material, pressed or moulded into shape, and having its face set out, said face portion being integral with the attachment, substantially as described. 3. A vignetting attachment for photographic printing frames, consisting of a piece of plastic material pressed into shape, and having an integral inclined face, substantially as and for the purpose set forth.

[We need scarcely say that this invention has *long* been familiar to our readers, thanks to Messrs. Lyonel Clark, George Mason, and others. —Ed.]

Collapsible Background for Photographic and Other Purposes.

No. 20,302. Franz Wiese, 19, Steglitzer-strasse, Berlin, Germany.—*December* 24, 1891.

For painting and photographic purposes a background for limiting distances is often requisite. It is easy to obtain such a background in studios or in dwelling-houses, but outside it is a matter of some difficulty, as high stretched wooden frames cannot be readily transported, owing to their great weight and awkward form.

This invention will remedy these defects by the construction of a collapsible frame, which may be set up and covered with the material used in any suitable part and place.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
February 1	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
" 1	Halifax Camera Club	
" 1	Peterborough	Museum, Minster Precincts.
" 1	South London	Hanover Hall, Hanover-park, S.E.
" 1	Stereoscopic Club	Brooklands Hotel, Brooklands.
" 2	Exeter	College Hall, South-street, Exeter.
" 2	Glossop Dale	Rooms, Howard-chambers, Glossop.
" 2	Herefordshire	Mansion House, Hereford.
" 2	Keighley and District	Mechanics' Institute, North-street.
" 2	Lewes	Fitzroy Library, High-st., Lewes.
" 2	North London	Wellington Hall, Islington, N.
" 2	Oxford Photo Society	Society's Rooms, 136, High-street.
" 2	Rotherham	
" 2	Sheffield Photo. Society	Masonic Hall, Surrey-street.
" 2	York	Victoria Hall, York.
" 3	Edinburgh Photo. Society	Professional Hall, 20, George-street.
" 3	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 3	Portsmouth	Y.M.C.A. Buildings, Landport.
" 3	Putney	High street, Putney.
" 3	Southsea	
" 3	Walthamstow	Egremont Institute, Egremont.
" 3	West Surrey	St. Mark's Schools, Battersea-rise.
" 4	Bolton Photo. Society	Baths, Bridgman-street.
" 4	Camera Club	Charing-cross-road, W.C.
" 4	Dundee and East of Scotland	Lamb's Hotel, Dundee.
" 4	Glasgow Photo. Association	Philosophical Rooms, 207, Bath-st.
" 4	Leeds Photo. Society	Mechanics' Institute, Leeds.
" 4	London and Provincial	Champion Hotel, 15, Aldersgate-st.
" 4	Oldham	Lyceum, Union-street, Oldham.
" 4	Tunbridge Wells	Mechanics' Inst., Tunbridge Wells.
" 5	Bristol and West of England	Rooms, 28, Berkeley-sq., Bristol.
" 5	Cardiff	
" 5	Croydon Microscopical	Public Hall, George-street, Croydon
" 5	Holborn	
" 5	Leamington	Trinity Church Room, Merton-st.
" 5	Maidstone (Annual)	"The Palace," Maidstone.
" 5	Richmond	Greyhound Hotel, Richmond.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

January 26.—Technical Meeting, Mr. W. Bedford in the chair.

Mr. Pope, the delegate of the Photographic Society of India under the affiliation scheme, was present.

Mr. A. Cowan exhibited Messrs. Harter & Driffield's "Actinograph," the use of which he explained. He mentioned that he had some months ago exposed plates based on the calculations of the instrument, and could not have found it act better by any amount of experience. One of Mr. Driffield's employés at Widnes, who knew nothing of photography, simply by following the instructions given, produced a large number of negatives, nine out of every ten of which would

have shamed any professional. For studio work the actinograph had been found correct.

Mr. J. R. Gotz exhibited his new film carriers available for use in the ordinary dark slide. A short fold on the carriers in the form of a spring keeps them in their place. In an ordinary double back the division may be dispensed with, and as the carriers, being made of thin sheet iron, are extremely light, a back loaded with carriers and films is, perhaps, not heavier than the back with a division.

In connexion with the subject for the evening, *Printing-out Emulsion Papers*, Mr. Gotz toned and fixed a number of pictures on Obernetter's matt surface gelatino-chloride paper. In the course of his remarks he mentioned that it was not necessary to print so deeply as on glossy surfaced papers. There was more detail in the shadows, and finer detail generally. He had known such paper to keep well for five years. Platinum toning was uncertain.

Mr. J. Howson next toned and fixed several prints on the new Ilford gelatino-chloride paper, accompanying the demonstration with a description of the toning and fixing baths recommended, and the manipulation of the paper generally. In reference to the keeping qualities of the paper, he mentioned that some of it had gone on a voyage to the West Indies and back, and remained in an excellent state of preservation. He thought the paper was best kept under pressure.

At the conclusion of Mr. Howson's demonstration, both he and Mr. Gotz were thanked by the meeting.

Mr. A. Mackie drew attention to the new methylated spirit regulations, and suggested that the affiliated Societies, in conjunction with the Photographic Society of Great Britain, should approach the Inland Revenue authorities, with the view of securing some modification of the regulation. It might be possible that the methylators should be allowed to sell quantities of not less than two gallons of the old spirit to authorised persons.

After some discussion on the subject, it was agreed that the matter should be brought before the affiliated Societies at the meeting about to take place.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

January 21,—Mr. J. Hay Taylor in the chair.

A question from the box was, "What is the specific gravity of one part of ammonia ·880, and nine parts of water?"

The answer as given by Mr. Bedford, jun., was ·988.

Mr. W. E. Debenham said that this was assuming one part added to nine made ten parts by bulk. If they added, say, one part of alcohol at ·880 to nine parts of water, they would certainly not get that result.

Mr. J. S. Teape said that he had developed a weakly printed gelatino-chloride print with gallic acid as directed in The British Journal of Photography, of December 4, 1891, but the picture took two hours to develop. He used six per cent. of a saturated solution of gallic acid. He had washed out the free silver before development.

Mr. Debenham thought this should not be done, and recommended the addition of acetic acid to the developing solution.

Mr. Teape also stated that with reference to Mr. W. Bolton's method (published in The British Journal of Photography) of getting rid of the mineral naphtha from the new spirit, namely, the addition of five grains of permanganate of potash to the ounce, he had tried it, and found the permanganate did not remove the mineral naphtha at all. He (Mr. Teape) remarked that Mr. Bolton himself did not make the experiment with the commercial spirit, but that made with the addition of benzoline, which might be quite another thing. The permanganate of potash dissolved in the spirit, but after a few minutes formed a heavy precipitate, which when removed left the spirit in its original state, as he found that with the addition of water it went milky as usual. He judged that there was thus no alteration in the alcohol.

The remainder of the evening was devoted to a lantern entertainment, the slides being contributed by Messrs. G. W Atkins, T. E. Freshwater, Beckett, Rawlings, J. Weir Brown, Kellow, L. Medland, J. S. Teape, Cole, and W. Bedford.

Camera Club.—January 21.—Mr. Alfred Maskell read a paper on *Photography and Arrested Motion*. Mr. F. Machell Smith occupied the chair. The Lecturer assailed the results of a large proportion of the instantaneous photography practised as giving only inanimate pictures, and incited to the use of methods and treatment which would better suggest a sense or idea of action and motion. A large number of illustrations were given, and the lecture excited a discussion, in which the Rev. Lambert, Messrs. Humphery, Fison, Patterson, Harrison, Davison, Davis, and the Chairman took part.

Lantern Society.—January 25.—Mr. C. F. Budenberg, of Manchester, read a paper, *On Pressure Gauges* [see page 70].

North Middlesex Photographic Society.—January 25, Mr. H. Walker in the chair.—A large collection of slides were shown by Messrs. Ainsley, Cherry, Gill, Gregory, Johnson, Jones, Marchant, Mummery, Plunkett, Smith, Taylor, Treadway, Wall, and Walker.

West London Photographic Society.—January 22, Mr. C. Bilton in the chair.—Mr. J. D. England read a paper on *Celluloid Films* (this will appear in a future number). The Lecturer described celluloid, and explained its manufacture, showing samples of clear and matt celluloid, such as is used in manufacturer's negative films, and also a specimen of ivorine. He explained the advantages of celluloid over glass for negatives, and showed carriers for holding the films in the slides, and a changing box. He then explained the necessary steps to be taken in developing, fixing, washing, drying, intensifying, reducing, and varnishing. He showed several specimens of negatives, and two exquisite stereoscopic positives on celluloid. The paper was followed by a discussion.

South London Photographic Society.—January 18.—The principal feature of the programme was an exhibition of dioramic effects in the triple oxy-hydrogen lantern, given by Messrs. Banks and Greaves, consisting of statuary, views, &c., which showed clear manipulation of the lantern, and included the fountains and illuminations at the Inventions Exhibition, the castle of St. Angelo, Rome, and Milan Cathedral by day and night, and last, but certainly not least, the progress of a memorable fire in Cheapside, which was received with loud applause. The last was a very interesting specimen of the photographic art, and one of the best in Mr. Banks' numerous collection. During the evening a selection of vocal and instrumental music was given. Miss Ella Thompson and others contributed songs. The duties of accompanyist were performed by Mr. Lewis Devaux. An exhibition of microscopic objects by members of the South London Microscopical and Natural History Club were much appreciated.

Brixton and Clapham Camera Club.—January 21, Dr. J. Reynolds in the chair.—The subject for discussion was *Printing Processes*, to which two excellent papers were contributed by Mr. F. Goldly and the Hon. Secretary (F. M. Levett), the former on *Plain Salted Paper*, and the latter on *Carbon Printing*. To illustrate his remarks, Mr. Levett developed two prints, which had been kindly sent down ready exposed by the Autotype Company. A number of photographs of the recent earthquakes in Japan were handed round for inspection by Mr. Burrows. Mr. Andrew Pringle will deliver an address at the next meeting on the 4th proximo.

Croydon Camera Club.—January 18.—Lantern evening for members' slides About two hundred slides, the work of Messrs. Hirst, Isaacs, Holland, and White, were submitted for inspection.

Bristol and West of England Photographic Association.—January 22, Mr. Brightman in the chair.—Mr. Hemmons read his notes on the proposed photographic survey of Bristol and neighbourhood. After discussion it was decided to form a Provisional Committee to allot the various portions of the work in the district and to make all other arrangements. Mr. Brightman then gave his paper on *Lantern Slides, and How to Make Them*, showing some lovely slides. He developed some carbon slides, illustrating a process which seems very seldom worked, although giving such fine results. The next meeting will be on February 12, when Mr. Harvey Barton will lecture on *Flashlight Pictures*.

Bristol Camera Society.—January 22.—The set of lantern slides, *Boston Illustrated*, sent over by the American Photographic Society, were exhibited by Mr. Dunscombe with a limelight lantern. A resolution was carried that the members prepare a set of slides illustrating Bristol for loan to the American societies.

Oxford Photographic Society.—January 19.—Mr. Frank Howard, of the Camera Club, gave a lecture on *English Pastoral Landscape*. The lecture was illustrated with numerous slides, many of them having been made from negatives taken twenty-five years ago. Nearly all the views were taken within twenty miles of Oxford, and clearly showed what simple bits of scenery will make a "picture" when a photographer knows how to select and photograph the view. Those in which were cattle, were especially fine. Twenty members and sixty visitors present. February 2, *The Oxford Photographic Society: What it has, and might have, Done, and should Do.*

Lewes Photographic Society.—January 19.—Several slides by Messrs. Braden, Bedford, Constable, Currey, Morris, Turner, and Wightman, were shown. The subject of the next quarterly competition, *Leafless Trees*, was announced. At the next meeting, on Tuesday, February 2, Mr. G. I. Wightman will read a paper on *Platinum and Bromide Printing: a Comparison and a Contrast.*

Tyneside Camera Club.—January 19. Mr. J. F. McKie (President) in the chair.—The President gave a lecture on *Enlarging, Copying, and Reducing, and the Apparatus for so doing.* He drew the attention of the members to Messrs. Griffith's apparatus for enlarging and reducing. He also described the various copying apparatus, and gave directions for getting the best results, and for preventing the grain of the paper from showing in the negative by means of reflectors. The lecture was illustrated by numerous diagrams.

Glasgow Photographic Association.—January 21, Mr. J. Craig Annan (Vice-President) in the chair.—The President, Mr. Wm. Lang, jun., F.C.S., delivered a lecture on the *South End of Arran*. The lecturer gave an account of the early history of this portion of the island, and showed, by means of the limelight, a large number of views. The following is a synopsis of the lecture: Early History and Writers—Monro, Martin, Pennant, and Headrick. Druidical Remains—Brodick, Brodick Fair, Lamlash, Holy Isle, and St. Molios, King's Cross. Bruce and Arran—Whiting Bay, Glen Ashdale, Dippin Point, Ailsa, Kildonan Castle, Signal Station, Pladda, and Benan Head.

Glasgow and West of Scotland Amateur Photographic Association.—January 18.—Mr. John Morrison, jun., occupied the chair until the election of Mr. Thomas Taylor as President of the Association. The Secretary read the Council's report for the past year, wherein it was stated that forty-four new members had joined the Association during the year, and that now the membership was 212. The Treasurer's financial statement showed that after providing for all debts there was a substantial balance at the credit of the Association. The members of Council for the coming year having been elected, there was a discussion on the new "Rodinal" developer, followed by the usual show of lantern slides.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

ENLARGED VIEWS BY ONE OPERATION.

To the Editor.

Sir,—My attention has been called to a long correspondence in your Journal between Mr. Dallmeyer and my old friend Dr. Miethe, of Potsdam, regarding a new (?) form of photo-telescope, which they claim to have invented, and also to your criticism thereon. While I have no

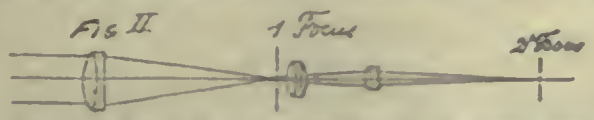
doubt these gentlemen fully believe their discovery is novel, I feel sure they will both be satisfied that they have been anticipated when I refer them to what I have myself done in the way of direct enlargement of images of different sizes by one operation through the knowledge I obtained from the plain instructions given in the works of Sir John Herschel, Peter Barlow, and others.

In the years 1869–70 I was engaged in constructing a large refracting telescope for astro-physical purposes for Baron von Bülow's observatory at Botheamp. Before erecting this telescope permanently at Botheamp, I had it set up under a temporary dome in my garden at Hamburg, for the purpose of trying known methods for direct enlargements by one operation. I was quite aware, from optical theory and from what had been already published, that this could be done either by negative or positive lenses used in conjunction with the objective; but, in order to judge which form of lenses gave the best results, I carried out both methods.

Negative Method (Fig. 1).—I used a threefold cemented achromat, about two inches in diameter and eight inches negative focus, and found this produced a powerful and well-defined image on the screen, and, by moving this negative lens along the axis of the telescope, I was able to

alter at will the size of the image thus obtained from a distant object. The objects principally operated upon were the moon, sun spots, and other celestial bodies, and I also tried it on the tower of the water-works at Hamburg, which was the only available object of which I could command a view.

Positive Method (Fig. 2).—I used a system of two positive achromats distanced for flatness of field, but not so far apart that the equivalent lens became negative. This method did not give the same definition or so flat a field as in the first arrangement with the negative achromats; but Dr.



H. C. Vogel, the astronomer, found it convenient, as it enabled him to use it in connexion with cross wires, or micrometers, which he could not use with the negative system. Of course, a wooden camera and screen was attached to the instrument in the usual way.

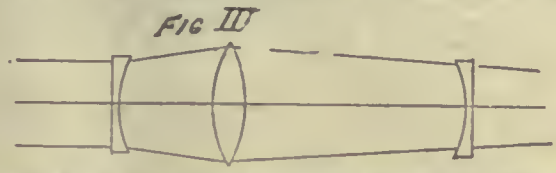
Before the instrument was removed to Botheamp, Mr. Höge, photographer of Hamburg, was occupied for a considerable time in taking enlarged photographs of the objects mentioned in different sizes by one operation, using the wet-collodion process then in use, and a great advantage was at once seen, as the structure was not interfered with by any deposit, which would have been the case had a small photograph been first taken and enlarged afterwards. This method of enlarging created considerable interest in Germany at the time, and Dr. Hermann Vogel (editor of the *Photographic Journal of Berlin*) paid me a visit to see the arrangement, and a photograph of the moon was taken in his presence by Mr. Höge, and he gave a long account in his journal of what he saw—I believe early in 1870.

On the completion of the telescope, Baron von Bülow deputed Doctor H. C. Vogel, the astronomer, to inspect the instrument and photographic arrangement. This gentleman expressed himself greatly satisfied with the results obtained, and he himself afterwards used the instrument at Botheamp very successfully in photographing the sun and other objects, which were shown to a large number of *savants*, amongst whom were several American astronomers and Doctor Huggins, F.R.S., who took great interest in the matter. The instrument, with its enlarging apparatus and camera attached, is still doing excellent work at Botheamp Observatory.

Some two or three years after this I constructed smaller instruments, for direct enlarging by one operation, to be used at the transit of Venus. These were employed with great success, and the results published in the German astronomical papers at the time.

As regards the original idea of direct enlargement by one operation, so far as I can judge, the negative *achromat*, used in the manner I have described, is the invention of Peter Barlow, who improved on Wolf's original system. See the *Telescope*, by Sir John Herschel (1861), page 50.

Doctor Donders, Professor of Physiology in Holland, also invented a system of three lenses, which can be used for enlarging direct by one operation, and which has been treated exhaustively in a paper by Professor J. A. C. Oudemans, Director of the Observatory at Utrecht, *Théorie de la Lunette Pancratique de M. Donders*. Professor Oudeman's formula shows two different arrangements of construction. The first



has two negative lenses outside and one positive lens inside (Fig. 3); and the second, two positive lenses outside and one negative lens inside (Fig. 4).

I may mention that, some few years ago, I constructed a gun-director telescope for Messrs. Ross & Co., for use in the Royal Navy, the principle of which would be equally suitable for producing enlarged photographs of various sizes by one operation.

I would add, in conclusion, that the principle of direct enlarging can be carried out partly or fully by reflectors.—I am, yours, &c.,

London, S.W., January 20, 1892. HUGO SCHROEDER.

[Dr. Schroeder is certainly to be congratulated upon the completeness of his researches in this direction, and, having reference to the dates given by him, he must, in the race for priority, be held as coming in an easy first.—ED.]

THE TELESCOPIC-PHOTOGRAPHIC LENS.

To the EDITOR.

SIR,—It appears that the idea of employing a Galilean telescope for the formation of images visible upon a screen dates further back than eighteen years ago. Nevertheless, the ground you take up, and upon which I shall meet you, is the matter of your own publication of eighteen years ago.

At that time, by your own confession, you were honestly (and naturally too) disappointed with the results; and, moreover, you confirmed this disappointment by a suggestion for an improvement by employing a negative lens of Petzval's "orthoscopic" form. It is not my intention to criticise the said suggestion, in that you have left the theoretical aspect of photographic optics to others. In the conclusion of your article of eighteen years ago, you appeal to such others to see if a combination could not be made to accomplish the end in view! Since that time, to the best of my knowledge and belief, no one had succeeded in accomplishing the end in view until I did so. Should Mr. Jarret's instrument be made on the same principle as my own, I shall be surprised, in that his most recent publication (in the *Photographic Gazette*, and referred to last October in the *Photographic News*) to attain the same end is distinctly a retrograde move; and, moreover, one well known to have been employed for solar photography for many years. Mr. Jarret's instrument, referred to by you, is not, however, described.

As to your remarks upon using one optical instrument for a different purpose to that for which it was originally constructed, I fail to find any hit. To take your own ground again, I ask, Was my late father's "triple wide-angle landscape lens," composed of three cemented lenses a valid patent? And yet, Sir, doubtless the triple-lens opera-glass front combination may have been, and probably was, used for photographic purposes as a makeshift!

The extreme limit of the appreciation possible, to a mind not fully at ease in theoretical matters, one could not expect to take any other form than the remark, "The new lens may be an improvement."

I "was taken by surprise" at the Camera Club, and had reason to be, after your previous attitude to me personally, and also as Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, in the controversy with Dr. Miethe, as set forth in my letter of the 8th inst. The surprise was not, however, prompted by the feelings you ascribe to me; the fact was, I could not have believed it of you, after the events of the previous few months referred to. It was a personal matter for surprise!

I need not reply *re* the small camera further than remind you that, when you describe instruments, and refer to a field being sharply covered as "small," it is misleading, unless definition at the margins of the field is destroyed. A more intelligent and applicable expression would be to state that the *angle* included is necessarily small. At the Camera Club, the negatives shown were taken upon "half-plates," with an extension of camera of thirteen inches (they might have been taken even on "whole-plates"), but this is a detail.

I still await the results of any further search you may make to show

that, with regard to this "improvement in photographic lenses," that some other investigator preceded me in making "a silk purse of a sow's ear." If you can do so, I trust I can appreciate the work of another as well as my own, and it would not be my object to "damn it with faint praise."—I am, yours, &c., THOMAS R. DALLMEYER.

25, *Newman-street, Oxford-street, W.*

[We are content to leave this matter as it stands at present, the more especially as Mr. Dallmeyer will find his concluding aspiration fully realised in Dr. Schroeder's letter, which precedes this.—ED.]

RATIO OF GRADATION.

To the EDITOR.

SIR,—Mr. J. R. Hopwood, Ph.D., in your last number calls attention to the fact that the investigations of Messrs. Hurter & Driffield appear to be quite ignored by photographers, although their principles, if satisfactorily established, would entirely revolutionise present ideas in regard to development. A careful study of the paper on *Photo-chemical Investigations*, by those gentlemen, will satisfy most readers that there is much force in the arguments there used, in which they endeavour to prove that the composition of the developer has no influence on the gradation of the resulting negative, but, at the same time, the experiments on which the new theory is founded seem scarcely exhaustive. Only small differences in densities were examined, viz., those produced by exposures of between ten and eighty of the units adopted, and these densities probably would not have sufficient contrast to show small variations clearly, especially as so much allowance has to be made for errors of experiment. They were also probably all included in the "period of correct exposure," in which, as the experiments show, progress is very regular. Whether conditions which apply to such densities would also be true at the extreme ends of the scale of exposures has yet to be proved. As regards these densities, however, all the developers tried, viz., pyro, hydroquinone, eikonogen, and ferrous oxalate, certainly gave very similar results, but they appear to have been generally mixed in about the normal working proportions, and only two experiments are mentioned in which these were departed from. In the first case the only alteration was that the usual quantity of ammonia was added to the pyro developer in six separate doses instead of at once, and in the other the amount of bromide was varied. The compositions of these developers are not given, but in the last case (cap. 16), judging from previous experiments, it would probably work out in English weights and measures as per ounce, pyro, 1½ grains; ammonia, 880° 2½ minims; bromide of ammonium, 3 grains. The results produced by this mixture are shown to be nearly identical with those produced when only one grain of bromide per ounce was employed. But much greater variations in the proportions of the ingredients are used in practice when trying to correct over-exposure on the one hand, or under-exposure on the other. The experience of many workers and experimenters is contrary to these conclusions of Messrs. Hurter & Driffield, so I think we must wait for further knowledge before entirely accepting them; still, there is clearly much in them that is true, although exceptions and modifications may have to be made.

Mr. Hopwood's account of the new principles is, I think, likely to be misunderstood. All that he states as to the proportionate increase of *density* in different parts of a negative during development is quite right, but *only* when using that expression *in the sense adopted by Messrs. Hurter & Driffield*, viz., as representing the amount of reduced silver in the part examined. But among photographers *density* is usually taken as meaning *opacity*, and in that case the principles are quite different. Opacities of 1 : 2 *might* by more prolonged development be changed to 1 : 3, but what is asserted is that the relations are so fixed that all other ratios would then change according to an unalterable rule. If any three parts of a negative under development had opacities in the geometrical ratios of 1 : 2 : 4, then further treatment might change the series to 1, 3, and 9, but never to 1, 3, and 8, for instance. Mr. Hopwood uses an argument which might appear to apply here, and it might be asked how, if in one part of the plate the opacity increased from 2 to 3, in another where it equalled 1, it could remain unchanged; but it must be remembered that, by Messrs. Hurter & Driffield's definition, an opacity of 1 means no opacity at all—it represents only the bare glass of an unexposed part of the plate.—I am, yours, &c., H. J. CHANNON.

Woodlands, Lewisham, S.E., January 25, 1892.

THE ORIGINATOR OF THE GELATINE PROCESS.

To the EDITOR.

SIR,—In reply to Mr. Bolton, on the originator of the gelatino-bromide process, will you allow me to say that it is the truth I am contending for, not the testimonial? I plead for justice, not charity.

I will confine myself to what is claimed for Dr. Maddox, namely, that "he was the first to publish a practical and workable formula." If this were true, I should be disposed to contribute a mite to the testimonial myself, but I know it is not true, and feel it to be a very unpleasant duty to say so.

I confidently affirm, and am prepared to prove, that Dr. Maddox never published what can with truth and fairness be described as a *practical* and *workable process*. The experiment he did publish was by no means the first record of an attempt to use gelatine as a substitute for collodion. Gaudin, Harrison, Kennett, and many others, were before him; but one and all failed to overcome difficulties which beset them, and neither of them made a useful gelatine plate—that is, one that would hold its own against collodion; consequently, they all sank into oblivion, without attracting the slightest notice from practical men or, indeed, from any one. The results were so discouraging that no one dreamt of repeating the experiments. There was no sign or hint of any advancement in the art of photography. An experiment that reveals no new truth is valueless.

What did Dr. Maddox discover? He says himself there was nothing new in what he did, and there was not an idea or hint of any kind that could be of the slightest use to any one who wanted to do something better in photography than had been done before. Infinitely better work could be done by the old processes. The gold-medal formula was a hap-hazard jumble of chemicals that no practical man ever did use, or could be induced to use. It was not capable of producing a decent print, which it was designed for, much less could a negative be got out of it, and yet it is, according to Mr. Bolton, a practical and workable process. But a stronger condemnation of the formula is found in the fact that its author immediately forsook it, and the negatives which were exhibited by Dr. Maddox must have been taken by some other process, which he never published. Indeed, we have his own word for that.

Mr. Debenham, with great astuteness, informed a meeting that he had taken negatives by Dr. Maddox's formula with a *modification* of his own. Then it was the modification that did it; and I call it a subterfuge, especially when no particulars are mentioned, to give a fictitious value to a worthless thing.

Mr. Bolton ought to know that there was no practical and workable gelatine process in the world till 1873. No process up to that time had appeared which made the smallest pretentions to compete with collodion, and until my discovery was announced gelatine was of no account. It was my honour to be the first to demonstrate that gelatine was not only equal to, but superior to, collodion for plate making, and, though I never published a formula, experimentalists fastened such a grip on it, that from that day to this they have never let it go.—I am, yours, &c.

Packham, Jan. 25, 1892. J. BURGESS.

CYLINDERS AND GAUGES.

To the EDITOR.

SIR,—Mr. G. R. Baker struck the true note when he said the hap-hazard way of making wonderfully cheap apparatus was the bane of limelight work, and I am sure no one who knows anything about the matter will quarrel with me when I say that in no department is it to be more censured, because of the danger, than in cylinders and gauges, and a remedy for the evil is imperative.

My experience in these matters goes back to the days before Brin's patent, and before the days when cylinders were turned out by the thousand; and when I compared the careful, scientific, and accurate manner in which cylinders in those days were tested with the slipshod, happy-go-lucky mode in vogue from four to two years ago, during which period the bulk of the cylinders now in use were made, the matter for surprise is not that the mishaps are so many, but so few. The same remarks apply to gauges.

But that the *principle* of Bourdon gauges is good, and that they can be, and are, made of the highest quality, facts like the following prove:—About five years ago Messrs. Schaeffer & Budenberg made for me a gauge sealed up to 6000 pounds to the inch; it is unencumbered with check valves or any other complication, and is as good now as the day it was made, though I have gauged with it upwards of 18,000 cylinders, oxygen, coal gas, and hydrogen, one after the other, in any rotation, often as many as fifty in one day. The only precaution taken was to wash the tube out well in the first instance with ether, and then keep it clean. The last time it was compared with a standard gauge, the registration had not varied even to the breadth of the pointer.

So long as poor, cheap cylinders and gauges are made, so long will there be found persons ignorant enough to purchase them. I am no advocate for the interference of Parliament, but wish to suggest what I think would be a very effectual remedy, if only it can be brought about. It is this: That the Photographic Society of Great Britain, as the parent Society, prepare a memorial for presentation to the Kew Committee of the Royal Society setting forth the dangers of using unreliable apparatus, and praying them to add to the Kew Observatory a department for testing high-pressure cylinders and gauges; and that this memorial should then be sent around to every photographic society to be signed by president or secretary on behalf of each society.

As among the members of the Photographic Society of Great Britain are several members of the Royal Society, one, at least, of whom is on the Kew Committee, a ready and influential means of communication between the two societies is already provided; and I venture to think a memorial backed up by the entire body of users of the apparatus in question throughout the country would not be without weight with the Committee.

Once get the department established, the rest is easy; it will be only necessary for every user to refuse to receive any cylinder or gauge that

does not bear the Kew monogram, and makers will not be long in sending their apparatus to be tested.—I am, yours, &c., EDWARD J. SMITH.

Park-royd, Halifax, January 25, 1892.

To the EDITOR.

SIR,—In a lecture by Mr. H. M. Whitefield on *Pressure Gauges*, which appears in the current issue of THE BRITISH JOURNAL OF PHOTOGRAPHY, I notice a reference to a description of an arrangement of Mr. Beard's for checking the too sudden entry of gas into gauges when used for testing high pressures. This evidently is taken from a report of one of this Society's meetings, where the said arrangement was spoken of, and my purpose in writing is to point out that Mr. Whitefield's non-understanding of the description is probably due to the condensation necessary in such reports, it being only practicable to deal with such matters in general terms. Mr. Beard's plan, as understood by myself and, I think, the other members who were present, is to insert in the entrance to a gauge a screw plug, practically closing the passage, but having the screw-threads so cut (a simple matter) as to allow gas at high pressure to pass slowly along the course of the thread to the gauge. All who have worked with gauges or regulators know that, however accurately the screw unions may appear to fit, the gas will leak past the screw unless the union is forced tightly home upon the seat, a washer being inserted to ensure a sound joint. It is this screw leakage which I understand Mr. Beard has taken advantage of to produce the gradual filling of the gauge, and it appears to be a practicable way of meeting the difficulty.

Mr. Beard is quite able to look after and to support his own interest in the matter, but I should not like a probably valuable arrangement to suffer by any apparently inaccurate or incomplete description.—I am, yours, &c., WILLIAM BISHOP,

Hon. Secretary North London Photographic Society.

January 26, 1892.

MIDLAND COUNTIES' POSTAL PHOTOGRAPHIC SOCIETY.

To the EDITOR.

SIR,—It is proposed to form a "Midland Counties' Postal Photographic Society" if a sufficient number of amateurs are found favourable to the movement, amateur photographers only to become members.

The principal object of the Society would be the monthly circulation of photographs (in albums or portfolios), accompanied by a note-book for criticism of the prints, and the award of moderate prizes for the two best in each set, the awards to be made by the votes of the members and recorded in the note-book.

It is proposed at present to confine the Society to the Midland Counties, and the number of members to fifty, as by that means the district will be compact and the circulation of parcels prompt and inexpensive.

Working details will be submitted later (for discussion) if it is found that sufficient names are sent in support of the idea.

The number of members admitted should be proportionate to each "County District" if there are sufficient applications from each district; if not, vacancies can be filled up from any other district.

Sizes of photographs to be from half-plate to 12 × 10 inclusive, and to be printed only in some permanent process, as platinotype or carbon.

A President and "General Secretary" to be appointed, and "District Secretaries" in each county, who would form a Committee of Management.

It would be pleasant, if possible, to have each year a "General Meeting" in the various districts alternately at a time of the year when the members could combine business, out-door photography, and social intercourse, so as to form an agreeable excursion under the guidance of the Secretary for that district.

Applicants for election to submit prints (when required) as proof of their photographic ability, for the inspection of the Committee (when formed), the *quality* of the work to form a guide as to precedence for election.

Ladies and gentlemen wishing to support the movement are requested to send their names and addresses (provisionally) to—

West Walk Leicester. GERMAN BANKART, *Hon. Secretary pro tem.*

TYLAR'S FILTER.

To the EDITOR.

SIR,—As agent for the Company who have introduced an improved, also economical, filter, I desire your indulgence in replying to Mr. Henderson's letter in to-day's issue. He tests and compares the merits and cheapness with something he purchased ten years ago, and which he personally improved upon by his own ingenuity; but I assume he has not purchased one of the form now issued, merely going by a paper description. This is not fair. Again, if the public were all of Mr. Henderson's calibre, many substitutes might be made for what is sold to-day. For instance, cameras of highly finished mahogany are no better for the purpose required than light-tight cigar-boxes. Further, I must thank Mr. Henderson for admitting the benefit by using a cheap filter for many years, although he carps at the novelty clause and a difference in price of 9*d*. Surely this is a trade matter. If he can make a filter of metal, indiarubber, charcoal, sponge, &c., as convenient and as good as that now put upon the market, without infringement, the world is open to him, and I fail to see the reason of his letter. In conclusion, I would remind your correspondent there is nothing new under the sun, and what was sold to him ten years ago may be improved upon and sold to-day as a novelty to a younger generation troubled with influenza.—I am, yours, &c., W. TYLAR.

Birmingham, January 22, 1892.

URANIUM TONING FOR PLATINUM PRINTS.

To the EDITOR.

SIR,—I have not seen it mentioned in connexion with the uranium toning bath that it tones platinum prints—hot and cold bath—equally well as bromide prints. This I find to be so, and that avoids the necessity for using the sepia paper.—I am, yours, &c., LOUIS MELDON.

Dublin, January 25, 1892.

STRAIGHTENING OF CURLED FILMS.

To the EDITOR.

SIR,—In reply to your correspondent, Miss May, re the straightening of curled films, we have a great experience in developing these films, and can recommend the following:—Soak the films for an hour in water, then place in a weak solution of glycerine, one part glycerine to thirty parts of water for five minutes, and pin down on a board, with film side up; in about twelve hours they will be dry, and in perfect condition for printing, though, when not in the printing frame, they must always be kept under pressure.—We are, yours truly, &c.,

Hampstead, January 25, 1892. THOS. ILLINGWORTH & Co.

OWNER FOR A CAMERA WANTED.

To the EDITOR.

SIR,—A box containing a camera and some other things, has been sent to us apparently in mistake. The Company know nothing of it, and have not received any communication about it.

The box was addressed to us in pencil written on the wood, but there is no indication whence it came.—We are, yours, &c.,

Watford, January 25, 1892. PAGET PRIZE PLATE Co.

CAMERA CLUB FIXTURES.

To the EDITOR.

SIR,—In consequence of Mr. Willis's absence abroad, his paper already announced to you for February 4 at the Camera Club is postponed, and the evening will be devoted to *A New Enlarging Lantern*, and demonstration, by Mr. S. Herbert Fry.—I am, yours, &c.,

G. DAVISON, *Hon. Sec.*

Camera Club, Charing Cross-road, W.C., January 26, 1892.

Exchange Column.

**** No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Wanted, to exchange a background, new, never used, for cabinet camera and lens.—Address, T. CLARKE, 27, Kingsland-terrace, York.

I will exchange a landscape lens, covers 8½ × 6½, for a rustic chair, or two single lenses for studio accessories.—Address, FRED. C. D. HEAD, Photographer, Shepton Mallet.

Wanted, 10 × 8 rapid rectilinear tight whole-plate camera or hand camera; exchange, Oakley's patent metamorphoser magic lantern and slides.—Address, COUCH, 11, Waterloo-crescent, Dover.

Wanted, 8½ × 6½ wide-angle rectilinear lens in exchange for balustrade, pedestal, large rock, cork floor stand, four plate-glass shelves with brackets, grass mat, and swing.—Address, H. M., 26, Arlesford-road, Stockwell, S.W.

ROCHDALE AND DISTRICT PHOTOGRAPHIC AND ART EXHIBITION.—This Exhibition was opened on Thursday, January 21, and will remain open until January 30. The photographic section has been confined to members of the Society only, it being their first year; and, considering this, the collection [illegible] great credit on the numbers. Amongst the enlargements are some by Messrs. Mackenzie, Jones, Fletcher, Leach, and Blombey, which all show capital work. Messrs. Samuel and W. Ingham (the Secretaries) have a collection of prints in bromide and silver, embracing several subjects, prize cattle, old buildings, interiors, and snow scenes. Mr. I. P. Spedding has been successful in securing some pretty bits of Warwick. Mr. J. H. Hoyle is well to the front with some good landscapes in whole-plate. E. H. Aldridge has a selection of hand-camera pictures. Messrs. Threlfall, Blombey, and Fletcher have also an excellent display. Lantern exhibitions are given each evening from members' slides, Mr. Harry Fletcher having charge of the lantern, Messrs. Crabtree, Fletcher, Greenwood, Spedding, Ingham, and others having filled up the different nights.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

ARS.—Received; with thanks.

L. MELDON.—Probably by combining three transparencies and photographing them.

C. E. WARDÉ.—Apply to Chance & Co., Birmingham. They may have such a glass in stock.

A. BROWN.—1. The second quantity is wrongly printed, as you suggest. 2. Yes. 3. Hypo.

"A."—The information desired, and much more on kindred subjects, will be found in the ALMANAC.

GRAINS.—You will find tables in the ALMANAC for facilitating the conversion of French into English weights.

ALEX. HENDERSON and WM. NOTMAN & SON (Montreal).—The address of Commandant Moëssard is 140, Rue de Grenelle, Paris.

C. H.—If the ground side of the glass faces inside, an occasional cleaning, as you suggest, is all that is necessary to remove the yellowness.

NEMO.—The *Court Circular* during the recent unhappy period invariably used the phrase "His late Royal Highness." From this we should be inclined to consider your description the correct one.

BRUNO.—1. The cut films of each of the makers you name are excellent. They do not require stripping. 2. Two or three ounces. 3. We have no means of telling; compare their respective sensitometer numbers.

LUX.—1. We are unable to give you exact weights, but for portability and lightness both types are unexcelled. 2. Without doubt. 3. A mere matter of taste. 4. Screw extension is, perhaps, to be preferred.

H. W.—1. The lenses referred to are all that lenses should be. 2. A quarter-plate portrait lens, and a half-plate, and 12 × 10 rapid doublet will answer your purpose. 3. Three grains each of potassium bromide and mercuric chloride. 4. Consult our advertising columns.

B. A. (Cambs).—If a process is published, it cannot be patented afterwards, either by the inventor or any one else. There is an exception to this, however, in the case of exhibitions, if certain conditions be fulfilled beforehand; but this would not apply in the case in question.

JOHN REDFORN.—1. Both the formulæ you specify are excellent for the various purposes named. 2. Metabisulphite of potash acts as a preservative of pyro or hydroquinone, and the same applies to soda sulphite and citric acid. 3. Leaper's *Materia Photographica*. 4. See answer to No. 2.

MRS. MOUNSEY.—The works we referred to are the flower photographs of Mrs. Payne and Mr. Stevens, to be occasionally seen in the Exhibitions. In our issues of May 20, 27, and June 17, of 1888, you will find a series of articles on photographing flowers. Our publishers will supply you with the numbers.

E. F. asks: "Could you kindly inform me in the JOURNAL what is used by crayon manufacturers to bind the black powder together in the making of black crayons?"—Different manufacturers use different materials, such as wax, soap, tallow, spermaceti, &c., or mixtures thereof. Of course they do not publish the formulæ they use. A few experiments will soon prove what will suit your purpose best.

WARWICK.—If your son was articled for five years to learn the business of a portrait photographer, he is certainly not being properly taught if he has been kept for three years and a half at the suburban printing place, doing an ordinary printer's duties, and has not yet had an insight into studio work and the management of sitters. Do as you suggest; act on the advice of your solicitor. We fear your case is not an isolated one with those who take "articled pupils" with a good premium. Scott's case was reported in the daily papers a few months back; we cannot give you the date.

WOODPECKER writes: "1. I should be greatly obliged to you if you let me know if, after selling a photograph for three years of a church, I can register it to prevent any one copying it. I might say a weekly paper has a large illustration from one of my photographs, and, after writing for the photographer's name, did not mention it. 2. Do you undertake to register photographs?"—1. The photograph can be registered at any time. It was very unhandsome of the paper not to credit the artist with the photograph from which the illustration was taken; but this is quite a common practice with illustrated papers. 2. Our publishers undertake the registration of photographs.

A. ROWELL.—If the negative has been varnished, it can still be intensified, but it will be necessary to first remove the varnish. Supposing that it is a spirit varnish, as most photographic varnishes are, this may be easily done. Place the negative in a dish of strong methylated spirit, and cover it up. Allow it to soak for an hour or two, with frequent agitation, and an occasional rubbing with a pledget of cotton wool. Then change the spirit for fresh, and repeat the treatment, and finally rinse with clean spirit. Some varnishes are very refractory; in this case the spirit should be used warm. No attempt should be made to intensify the negative until the whole of the varnish has been entirely removed, and the negative well washed with water, otherwise stains will result.

COPYRIGHT writes: "I have purchased a business which contains some very valuable negatives; these were copyrighted some ten years ago by a previous proprietor, now dead. I would be much obliged if you would answer, through your "Answers to Correspondents" column, whether these negatives could, or should, be re-copyrighted in my own name, and how I should proceed."—As the copyright in a photograph is vested in the author of the work, our correspondent could not re-register it in his name. The only way we can see of securing copyright in the negatives is to get it assigned by the representatives of the deceased author—the one who took them.

C. J. KIRK writes as follows: "Some time ago, in reply to a querist, asking the reason for stains appearing on opalines, you said the gelatine is mostly acid. I find also that glue, with which we stick on the backs, is even more so. Can you suggest a sure and practical way of neutralising these? With the greatest care and cleanliness we find these spots sometimes appear after even six months. Your help will be greatly esteemed."—As our correspondent says, glues are, as a rule, more acid than gelatines, and therefore should always be avoided. Instead of attempting to neutralise the acid in gelatines, it is far better to use those which are neutral. English gelatines, such as those of Nelson & Son, are in this condition, and therefore should always be used, in preference to foreign, for mounting photographs.

J. D., who is a second operator in a London studio, writes that he attends to the camera in every detail with the exception of uncapping the lens and the posing of the sitters (some require no posing), which part the first operator does. At the finish of the day's work the second operator develops the whole of the negatives, the first operator not seeing them till they are finished next day. The question is, the first operator says he took them, when the second operator says he also took them. Is the second operator equally justified in saying he took them, the first operator posing the sittera and uncapping the lens, whereas the second operator does the focussing, seeing that there is nothing out of place, bad points, &c., and last, but nowise least, develops the negatives?—The second operator is assistant to the first. He can only claim as such. He is clearly entitled to the credit for the exposure and development—the manipulating part of the work.

CROYDON CAMERA CLUB.—Fixtures for February.—1, Annual Meeting, election of officers, &c. 15, *Warm Tones on Bromide Paper*, by J. Weir Brown. 29, Lantern Night.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—On February 2, Professor R. Meldola, F.R.S., will deliver a lecture on *Photography as a Branch of Technology*. Tickets can be obtained on application to the Assistant Secretary.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—February 4, *Means of Obtaining Clouds in Landscape Negatives*. February 11, *Isochromatic Plates*, Mr. John Howson. February 18, Lantern and Musical Evening, in the Large Hall, Champion Hotel.

THE PHOTOGRAPHIC CLUB.—February 3, Ordinary Meeting, the paper *On Photo-mierography* being unavoidably postponed, owing to the indisposition of Mr. T. Charters White. February 10, *Glass Blowing for the Laboratory*, Mr. A. Haddon.

PHOTOGRAPHY IN COURT.—*Turner* v. *Elliott*.—The plaintiff in this case is Mr. J. E. Turner, the owner of two freehold houses called Brooklands and Covington-house, both in Park-road, Barnet. The defendant, Mr. J. J. Elliott, is the owner of land (adjoining the plaintiff's premises), on which are works of considerable extent, and in connexion with the defendant's business of a photographer or photographic printer, and from which, according to the plaintiff's statement, he permitted to escape vapours, gases, smoke, and offensive smells, injurious to the health and comfort of, and occasioning nuisance and injury to, the occupiers of the plaintiff's premises. The plaintiff accordingly came to the Court for relief in the shape of an injunction to restrain the defendant, his servants, workmen, and agents, from permitting any vapours, gases, smoke, or offensive smells to escape from the buildings or works of the defendant, or otherwise carrying on his works in such a manner as to be injurious to the health or comfort of, or occasion nuisance or injury to, the plaintiff, or his family, or other the occupiers of his premises. The action came on for trial in May, 1891, and, after the trial had lasted several days, his Lordship, by consent, appointed Professor Raphael Meldola, F.R.S., to visit and inspect the premises, and to inquire and report whether or not the plaintiff's premises were affected by smells or smoke coming from the defendant's premises; and, if so, in what manner and to what extent, and how the same were caused or arose. Professor Meldola's report was brought before his Lordship to-day. Mr. Justice Romer found on the evidence that no nuisance arose from the defendant's chimney, but that there was a nuisance from the albumenising process carried on at the defendant's works. His Lordship accordingly granted an injunction to restrain the defendant from permitting any vapour or offensive smell escaping from his works so as to be a nuisance to the plaintiff in respect of his premises. As, however, the plaintiff had not been successful in proving the whole of the allegations made by him, his Lordship ordered the defendant to pay only half of the plaintiff's costs, and directed that Professor Meldola's fee should be borne by the parties in equal shares. The operation of the injunction was suspended for a month.

CONTENTS

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1657. Vol. XXXIX.—FEBRUARY 5, 1892.

CELLULOID FILMS.

From such indications as we are able to observe, we believe that the employment of cut celluloid films in place of glass plates for the support of the sensitive film is likely, during the approaching season, to be more extensive than in preceding years. Film carriers for placing in the ordinary dark slides are to be obtained, fulfilling the important requirements of simplicity, efficiency, and inexpensiveness, while to a great many hand cameras special sheaths are now fitted which allow of films being held *in situ* as easily as glass plates. Thus, so far at least as the amateur worker is concerned, there are abundant facilities for the adoption of films in outdoor work to effect that considerable saving of weight which has so long been his aspiration.

Hitherto the use of cut films for out-door photography has not prevailed to anything like the extent that had been predicted or expected of them on their first introduction. The causes of this comparative neglect are perhaps threefold. In the first place, few, if any, efficient means of holding the films in the ordinary dark slide in a perfectly plane position were, until recently, available; secondly, such commercial brands of films as were on the market were only too frequently open to the imputation of being defective, both as regards the flatness of the films themselves and the irregularity and inferiority of the emulsion with which they were coated; and, thirdly, their development and general manipulation were erroneously, if, perhaps, not quite unnaturally, assumed, and sometimes found to be more uncertain and troublesome than glass plates. The first of these drawbacks no longer exists; the second, owing to improved methods of manufacture and greater knowledge on the part of the manufacturers as to the conditions of successful preparation and coating of the films, has also, we believe, in great measure disappeared, and the third is also equally non-existent.

It is a condition inseparable from all new methods and processes that in the earlier stages of their employment, failures and irregularities should be experienced, and to the manufacture of cut films coated with gelatine emulsion, and consequently to their use and manipulation, this reservation applies with peculiar force. It was hardly to be expected that the makers would at once be able to determine the best kind of celluloid for coating purposes, the particular preparation or cleaning that the uncoated film should undergo, and the best system of applying the emulsion to the support. Experience alone could give the necessary knowledge, which is the key to success in these regards. That this knowledge has been attained by the various manufacturers, native and foreign, we are inclined to believe, inasmuch as for some time past the complaints of badly coated films and "spotty" emulsions, which we at one time constantly received, have almost entirely ceased.

These remarks are suggested by the brief paper on celluloid films read by Mr. J. D. England at a recent meeting of the West London Photographic Society, and which our readers will find reproduced at p. 87 of the present number of the Journal. Mr. England, we believe, has for some time past been engaged in the commercial preparation and coating of celluloid films, a fact which lends additional interest to his remarks. We cannot reasonably expect the modern manufacturer to admit us to the secrets of his business, and therefore we do not complain that in his excellent little paper—the brevity of which is not its least merit—Mr. England does not tell us the preparation which he gives the uncoated sheets of celluloid before applying the emulsion, and neglects to describe the "special appliances" used in coating to which he refers. All the same, this information would have been interesting, we are sure, both to his hearers and readers.

The advantages of celluloid films over glass plates are obvious. Their lightness, portability, and immunity from breakage are of the highest economical value. They reduce, if they do not prevent, halation when photographing many subjects, such as those where the tops of trees cut the sky-line; although, for interiors, a backing of some kind cannot by any means be neglected. By using carriers specially made for cut films their exposure in the ordinary dark slide becomes a matter of ease. We are inclined to hope, however, that in course of time the dark slide itself may be so adapted as to receive either glass plates or cut films at will, without the necessity of having to use special carriers. This may be a suggestion worthy the attention of the makers.

We may pass by the exposure and development of celluloid films, since these operations differ in no material respect from glass plates. The films keep flat in the solutions, and there are varnishes procurable which, when applied to the film, do not disintegrate the support, upon which, as is well known, solutions containing alcohol have a solvent action. The applications to which celluloid films may be put are, as Mr. England points out, both diverse and numerous. For stereoscopic purposes, the fact that a stereoscopic film negative can be cut with a pair of scissors, and the halves transposed and mounted upon glass, thus obviating the necessity of reversing the prints, it is obvious that the employment of celluloid films is of great value at a time which is witnessing a marked revival in this branch of photographic work.

Film negatives are useful in obtaining reversed results for photo-mechanical work; and this fact, to our thinking, is one which will not improbably lead to a considerable use of cut celluloid films among professional photographers, who, up to the present time, have, we believe, neglected them almost entirely. That they will ever supplant glass plates for studio work is hardly feasible, but we are surprised that professional landscapists have not adopted them. When, however, a de-

lusion, which we know to be prevalent, that the sensitive emulsion placed on sheets of celluloid necessarily falls short in point of quality from the sensitive compound on a glass plate, is removed, we fully expect that professional outdoor photographers will adopt films instead of glass—at least, where a great number of plates have to be carried about from place to place. Mr. England's warning against packing films under too much pressure, and so avoiding any loss of sensitiveness thereby caused, is a hint which should be borne in mind by amateurs, who may be prone to pack these films too closely together and under too great pressure.

COLOURED PHOTOGRAPHS.

A VERY important part of the business of the professional photographer in many towns is the supplying of coloured photographs, often the only class of work which his clients will accept when, the portrait of some dear one gone to his long home, a portrait is often as not most indifferent in execution. There at once arise two questions, first, the probability of retaining the likeness when the painting is fully done; and, second, the probability of the permanence of the picture when it is done in colours. These two initial difficulties are potent stumbling-blocks, and, more frequently than not, every endeavour is made to induce the client to have a picture in black and white; for here there are processes to choose from whose results may in all human probability be classed as absolutely permanent—platinotype and autotype, and, as considered by some, though there is an element of doubt, bromide prints. These, if worked upon by suitably selected colours, leave no doubt whatever upon the photographer's mind, and he feels certain that, if his is a "family business," there will be no pictures brought to him in the course of a dozen years showing fading effects of a marked and unreliable character. When colour effects are, after all, selected, there can be no doubt that experience points out that a large number do fade, and an anxious point to consider is how to proceed to prevent such disaster.

Now, there are, to begin with, many mediums upon which the picture may be executed—paper, opal, ivory, and paper prepared with gelatine for carbon work.

When opal is selected, there has, in time gone by, been a great predilection in favour of collodion transparencies, and, in view of the non-fading character of the old glass positives, it has been assumed that opal transparencies in collodion should also keep from fading. There is no excuse for a photographer getting a large price for a painted photograph, the base of which he knows to be fugitive; and it must be observed that the parallel mentioned is false. Old glass pictures that have not faded are protected by a thick coat of varnish. Where this has not been done the picture always fades, that is, alters, and darkens, through the action of the sulphur in the atmosphere upon the silver of the image. A strong varnish upon an opal to be painted, as are most, in water colours, is not permissible, from the technical difficulties it would put in the way of the artist-painter. Hence such a base should decidedly not be chosen for the purpose. But a silver in gelatine, *i.e.*, a bromide print, is far more analogous to a glass positive, owing to the silver being imbedded in a film of gelatine practically impermeable to air. Further, the removal of hypo is more readily carried out than when the bromide is on paper, and, so far, is safer. Hence about such a base it can be said there is only a question as to the possibility of fading. Carbon prints upon opal may be looked upon as absolutely permanent the only possibility to the contrary being the liability of the film to slide off when large quantities of medium or of gum are used in the shadows to give effect and richness. To mention this is to point out a remedy.

As to a paper basis, there were the three typical methods we have named—carbon, platinotype, and bromide—each having its advocates. As to the permanency of the latter, our remarks just made about opal are all that need be said. Platinotype is so familiar that it can be carried out on the premises, while, for some reason or other, carbon work cannot be—or, rather, we should say, is not usually—so done, the services of the professional enlarger generally being called in. It is a pity that this should be so, seeing the process is far easier than those who have not tried it can believe. To paint upon the surface of a carbon print requires some little thought at first, for the colours do not "wash" so freely as on drawing-paper, or, indeed, as platinotype, though it must be observed that the latter need some kind of sizing first, to get rid of the porosity of surface induced by the hot fluids they are developed in, if from no other cause. Carbon prints, again—whether on paper or opal, and especially on the latter—have the advantage of allowing any objectionable shadow or unwelcome form to be removed by the scraper or ink-eraser, which is impossible with platinotype, through the image being imbedded in its texture.

So far for the actual photograph itself upon which the artistic colour work is carried out. There remains to consider the colours themselves, a question of great, nay, paramount importance. The *technique* of the artist is no province of this paper to deal with, but the actual colours used are decidedly within its purview, and we purpose shortly to refer to them in a further article from a chemical and technical standpoint.

GRADUATED VIGNETTES.

OUR condemnation of the ordinary "vignette glass" in our article of a fortnight ago has been taken too seriously by more than one correspondent, as applying to every form of graduated vignette, unless used in conjunction with a rotating frame or other means of further softening the gradation. If reference be made back to our remarks, we think it will be clearly seen that they referred solely to the hand-made vignette glasses in which the delicacy of the shading depended entirely upon the judgment and skill of the workmen in removing more or less of the flashed colouring matter from the surface of the plate, and in which, under the circumstances, the result was never, and could scarcely be expected to be, of a satisfactory character.

While in a great measure adhering to the opinion already expressed that the best results are only to be obtained when the printing frame is kept in constant motion, we are ready to admit that, with a properly and carefully graded vignette, the necessity for this constant alteration of position of the frame disappears. But such perfectly prepared masks are rarely, if ever, met with in commerce, and few photographers deem it worth while to give special attention to their manufacture, hence the numerous makeshifts of former years continue to be used.

In point of convenience nothing can possibly excel the graduated screen placed in contact with the negative, as it were, forming part thereof and effecting, without other assistance, the whole task of graduation. With such appliances the printing frames may be left to themselves, instead of being closely and

constantly watched, as when other methods of graduation are adopted, and the process of vignetting becomes as easy as ordinary printing. But to secure this result the vignetter must be not only perfect in itself as regards shading, but must be suited to the character of the negative with which it is to be employed.

. There are numerous methods by which vignetting masks, perfect in their graduation, can be prepared with very little trouble if the photographer will but give his attention to the matter; and, though most of these have been previously described, it may not be out of place to recapitulate them here for the benefit of those who are not familiar with the various methods. The process may be divided into two parts, the mechanical and the photographic, the former having to to do with the graduation of the screen, the latter with the sensitive surface employed.

Taking the mechanical side of the question first, we have choice of methods. The camera may be employed, if desired, to produce a vignetted *cliché* or positive, from which negatives may be reproduced by contact printing, or, if only a single one be required for a special negative, it may be made direct. The *modus operandi* in this case is very similar to that of vignetting an enlargement; an aperture or disc, according to whether a positive or negative is required, is kept in motion between the lens and the source of light, or between lens and plate, and at such a distance as to be completely out of focus, the degree of graduation depending upon the amount of movement imparted to the mask or disc. It is obvious that, when one accurate graduation is obtained, it may be reproduced to any extent either of the same dimensions or larger or smaller. The employment of the camera, of course, necessitates the use of tolerably rapid plates or films.

The simpler plan, however, seems to be to produce the *cliché* in the printing frame by one or other of the methods usually adopted for direct vignetting, but necessarily by one of those of which we have spoken as giving perfect graduation. Some operators may prefer to use their favourite vignetting method, but none, we think, will be found to give results equalling those obtained from the revolving frame. This is, moreover, so easily put into practice that we strongly recommend it in preference to any other, no matter whether artificial light or daylight be used, though the precise methods of working will differ slightly with the light.

A square board of suitable size is suspended by its corners, so as to form a horizontal table, and this is hung from the hook of an ordinary roasting-jack as the source of motion; or, if the jack be not available, a number of strands—the more the better—of worsted twisted together will form a very good substitute, untwisting and re-twisting a number of times under the weight of the printing frame and its platform, and only requiring an extra wind occasionally to prevent its becoming stationary.

Working in ordinary diffused daylight with one of the slower photographic processes, the printing frame is placed upon its revolving platform, and left until the light has sufficiently acted. If a reversed *cliché*, from which negative vignettes can be reproduced, is required, the front of the printing frame is covered with an opaque mask, carrying an aperture of suitable shape, the size of which will depend in a great measure upon the distance at which it is placed from the sensitive surface; the greater the distance, the wider the spread and softer the gradation. If the light be bright, the aperture is better covered with tissue paper or ground glass, though, even in direct sunlight, if the rotary motion be kept up regularly, it is scarcely possible to produce a really bad result without this extra means of diffusing the light.

It is quite unnecessary to resort to any of the usual methods of softening the edge of the aperture by serrating or by gumming cotton-wool to it. The revolution of the frame produces the softening, and the only effect of serrating the aperture is to practically increase its size. Of course, any shape of aperture may be adopted, from a true ellipse to any of the forms more closely assimilating to the outlines of the head and shoulders, one of the best, perhaps, for general purposes being an egg shape, with the smaller end uppermost. In most vignetted busts it will be found that the shading of the lower portion of the body is more gradual than that about the head, which should be clearly cut against a nearly white background. To secure this effect in the vignetter, it is only necessary to incline the mask at an angle with the sensitive surface, the upper portion being the nearest.

If it is desired to produce a negative vignetter direct without the trouble of a second operation, instead of the mask with an aperture, it will be necessary to use a glass plate with a piece of opaque paper or card of suitable shape fixed to the centre. For instance, if it be necessary to form a screen to vignette closely to the shape of a particular figure, we should cut out a piece of opaque paper the shape of the figure, but an eighth or a quarter of an inch larger each way, according to the degree of softness required and the distance at which the mask was to be placed from the sensitive surface. This would be arranged so that the clear aperture left in the centre of the vignetter after exposure would be the size of, or a trifle less than, the actual size of the figure to be operated on.

In daylight, and with slow photographic methods, the exposure will, of course, be a comparatively long one, and the progress of the operation can be watched as in ordinary printing, and slight modifications of the adjustment of the mask made if deemed necessary; but, where artificial light is concerned and rapid plates, some little extra care will be required in order to ensure the proper diffusion of the light, and the size, shape, and distance of the mask will have to be accurately adjusted in the first instance, as there is no opportunity of subsequently altering them. The mechanical arrangement of the revolving table will remain the same as for daylight, and the chief care will have to be in the arrangement of the position of the light. This will vary with the source and character of the light and its strength, the more powerful it is the greater the distance at which it should be placed in order to avoid too sudden contrast. The softness of gradation can be greatly modified, too, by changing the angular position of the light; if vertical, or nearly so, in relation to the exposed surface, the gradation will be comparatively abrupt, and, in proportion as it is brought down to an angle of about forty-five degrees, the softening will be correspondingly increased. It should also be remembered that a large area of illuminating surface will give a softer result than a small flame or point of light, and that therefore means should be adopted to increase the illuminating area by means of reflectors, or by multiplication of the number of lights. A large plane reflector in close proximity to the light will produce the desired effect.

Of the sources of light available we should select for gelatine or rapid plates gas or lamplight suitably diffused. For slower plates, such as collodion emulsion, the more powerful form of lamplight, with comparatively long exposure, will prove suitable, or magnesium wire, burnt at a distance from the sensitive

surface, and close to a light-coloured wall or reflector. Whatever the source of light and other conditions, it will be advisable to ascertain by actual experiment beforehand the most suitable positions for the light and sensitive surface.

The photographic methods of producing the vignetters will be discussed in a succeeding article.

The New Methylated Spirit.—The question we asked some time ago, as to what the photographic societies were going to do in the matter of attempting to obtain some modification of the obnoxious regulation necessitating the addition of mineral naphtha to methylated spirit, has, we are pleased to observe, been answered in two quarters. The Great Britain Society had the matter under discussion at its last technical meeting, and the London and Provincial immediately afterwards followed suit. We hope to hear that concerted action will soon be taken to approach the Somerset House authorities, with the view of obtaining a remission of their Draconic rule.

The Camera Club.—The list of members of the Camera Club now totals up 684, the town members numbering 322, 18 being life members. There are 269 country members, of whom 43 are life members. The foreign members number 39, and 54 members joined from the late Amateur Mechanical Society, of which 12 are life members. We are glad to learn that with the present membership and the prospective normal increase for the current year the Club is on a sound footing. Certainly a roll of 684 is one of which the Club may well be proud, and the best possible justification of its foundation and existence.

Professor Meldola's Lecture.—Although the attendance at Professor Meldola's lecture on *Photography as a Branch of Technology*, at the Photographic Society of Great Britain, on Tuesday night, was not large, the reception of the lecture was as favourable as could be wished for, and the discussion that ensued eminently appreciative and practical. Both as a review of the important part photography plays in modern science, as well as suggestive of the possibilities which underlie such an institute as the Professor pleads for, the lecture was a valuable utterance, and we are confident that the Society and the affiliation scheme will profit by the thoughtful manner in which the Professor performed his task. Unhappily, he was unable to be present to hear the cordial manner in which his ideas were echoed.

Papers at Societies.—Any one who turns up the reports of photographic societies, say, of twenty years ago, must necessarily be struck with the marked difference between the proceedings at them then and now. Then the papers read were almost exclusively of a technical character—new processes, or modifications of old ones; now they partake largely of an entertaining nature, a prominent feature being the lantern; indeed, in some instances just now, lantern society would be a more correct title than photographic society. Much of this change is due to gelatine quite superseding all the other dry-plate processes.

Patents.—The number of patents taken in connexion with photography increases annually, and some will, no doubt, lead to litigation. There is no question that the litigation of patents is usually made more costly than need be. Recently, Mr. Justice Romer, in giving judgment in an action for infringement—with regard to screws—that had occupied the Court for fourteen days, and in which most of the leading counsel in patent matters were engaged, took occasion to severely censure the method of conducting patent cases generally. He complained loudly of the time occupied and the expenses incurred in these actions, and said the fault lay with the professional gentlemen engaged—over-zeal, want of compression in examination, cross-examination, &c. It is to be hoped that his Lordship's remarks will have weight in any case in which photography is involved.

Stage Moons.—Professor Hubert Herkomer is a man of many parts. He has just been telling theatrical managers how to light their stages—both with gas and moon. Mr. A. W. Pinero thinks the Professor may certainly claim to have discovered a new moon, of which, however, no particulars are vouchsafed. Mr. Pinero has known many stage moons, of which the most inoffensive is that for which we are indebted to the ordinary magic-lantern. At Bushey this illuminates the fleeting clouds. The lantern is an old servant of the stage.

Instantaneous Photographs.—On several previous occasions, we have directed attention to the fact that "instantaneous" pictures frequently do not convey the impression intended. Instead of giving an idea of moving objects, they often give one rather of sudden suspended motion. Thus a photograph of a railway train, however fast it might be travelling, if it showed the spokes of the wheels sharply defined, would represent it as standing perfectly still. The late Mr. O. G. Rejlander, many years ago, well exemplified this in a couple of photographs of a girl at a spinning-wheel. In one, the foot and spokes of the wheel were sharply rendered; in the other, where several seconds of exposure had been given, they were, of course, considerably blurred. Yet it was the latter that gave the best impression of an instantaneous picture. This subject was ably treated by Mr. Maskell, at the Camera Club last week.

Jena Glass.—Is not Mr. Thomas S. Taylor, of the firm of Taylor, Taylor, & Hobson, who the other day gave a discourse on lenses before the members of the Liverpool Amateur Photographic Society (see p. 92), incorrectly reported in being made to say that he could see no advantage in employing the new Jena glass in photographic objectives, except "variety"—whatever that may mean? Surely Mr. Taylor must be aware that the properties of high refraction and low dispersion, which certain of the new glasses possess in an eminent degree, conduce, among other things, to obtain a degree of flatness of field which, as was said by Mr. Debenham at the London and Provincial meeting the other night, constitutes the greatest advance in photographic optics since the introduction of the Steinheil aplanat twenty-four years ago. Will Mr. Taylor kindly inform us with what other kind of glass than that of Jena it would be possible to construct, for example, a lens having concentric external curves—that is, curves struck from a common centre—by which a corrected image would be formed? We incline to the opinion, however, that Mr. Taylor has not been rightly reported.

Fetid Albumen Paper.—A case of considerable interest to photographers who sensitise their own paper was decided in the Court of Chancery one day last week, a brief report of which appears in our previous issue. It was an action to restrain Mr. Elliott, of Barnet, from carrying on his business in such a way as to cause a nuisance to the plaintiff, a neighbour. The suit, it may be mentioned, by reason of the conflicting evidence adduced, occupied the Court for several days last year, when the learned Judge appointed an expert to visit the premises and report. The report was to the effect that, although there was no nuisance in regard to the chimney complained of, there was from the albumenised paper employed. Hence an injunction was granted in respect to that. If the effluvium—"albumenous vapours," as one of the papers has it—given off in sensitising some papers is a legal nuisance to neighbouring houses, what must it be in the same building? Many photographers who do their printing on the same premises as they have their studio do not occupy the whole of the house. Now, after the decision just referred to, any of the other occupants could easily, if they choose, put the photographer to serious inconvenience. We were forcibly reminded of this the other day on entering premises, the lower portion of which was let as offices, and the upper occupied by a photographer. The effluvium from sensitising paper pervaded the whole building at the time of our visit, and was most sickening.

Important Copyright Decision.—An action, under the Copyright Act, was decided in the Court of Queen's Bench on Friday

last week, which is of considerable importance, inasmuch as some novel points were raised. Messrs. Lucas, Mendoza, and the Berlin Photographic Company brought an action against Messrs. Williams & Sons, of Wimbledon, for selling photographic reproductions of their copyright in pictures such as *The Peacemaker*, *Quiet to Ride and Drive*, &c. The plaintiffs, instead of taking summary proceedings, elected to sue, in a superior Court, for damages, and an injunction to restrain—penalties under Section 6, and damages under Section 11. One of the pleadings of the defendants was that, in the case of Mr. Lucas, the plaintiff sent his agent, who gave an address at Belfast, to sell him copies, and after the sale a writ was issued. One of the defendants in his evidence said that, when he purchased the photographs, he thought he was justified in doing so, and afterwards, when he met the man who sold them, he chastised him, "giving him black eyes and a cut head." One of the points raised by the defendants' counsel was, that the Act complained of being a criminal one, in order to recover, the plaintiffs must prove that the defendants committed the acts knowingly, and there was no evidence of any such acts. Mr. Justice Collins also pointed out that under Section 11 the damages must be special, and of this the plaintiffs had given no evidence at all. In the result, the jury found that the defendants had sold the pictures without guilty knowledge, and for the plaintiffs with a farthing damages in each case for exhibiting, and no damages at all for the sale, as that was to the plaintiffs' own agent, and at their own instigation. An injunction was granted to restrain further sale, and all copies in hand to be forfeited, and the defendants to pay the costs. On the application of the defendants' counsel execution was stayed, so that we have possibly not yet heard the last of the case.

Compromising Copyright Cases.—In the foregoing case the defendant in his evidence said that after receiving a letter from the solicitor, he went to his office and saw him, and was very indignant at the proposal made to him as to a settlement, and left the office abruptly. In prosecutions for infringement of copyright, the owner of it has two courses of procedure open to him. One summarily before a magistrate, the other by action in a superior Court. The latter is the more costly mode of proceeding, and not infrequently induces the defendant to pay a certain sum to compromise the matter. It was mentioned that the photographs complained of were made in Germany, and we have seen similar ones hawked about the streets of London. This being the case, how is it they are allowed to pass the Customs? Section 10 of the Act expressly forbids the importation of pirated works. One would almost have thought that the owners of valuable copyrights would prefer to prevent the importation of piracies rather than organize costly prosecutions against persons who might be innocent of knowingly transgressing the law.

PHOTOGRAPHING "THUNDERBOLTS."

"What is a thunderbolt?" is a reasonable question to ask, now that photographing wild fowl of that ilk has begun. Along some parts of the south coast of England nodular lumps of a heavy substance are to be found, which some of the peasantry gravely point out to the visitor as thunderbolts. Somewhat crystalline masses of the same substance are found in the chalk and clay dug out in the Channel Tunnel works, and so bright as to strongly resemble gold; in time the exterior oxidises, and each lump assumes the ordinary appearance of iron pyrites. These fetishes, like the nodules of hematite iron pointed out as thunderbolts near Tenby, were never launched from heaven by Jove; indeed, Jupiter, from his ivory throne with his screaming eagle at his feet, would have been ashamed to hurl such sorry specimens of his power, as any one would say did he see the Channel Tunnel specimens lying before me as I write. They came from the works on the English side of the Channel. When examining the works on the French side, I heard nothing about the finding of pyrites.

It was at the meeting of the Camera Club recently that Mr. A. Maskell projected on the screen a lantern picture of a "thunderbolt," taken, he said, by an amateur at Newcastle (Mr. Dunn) during a storm of thunder and lightning. When the flash took place it differed in appearance from no other flash; but, upon developing the plate, a remarkable object was revealed—a kind of luminous globe, with flame-like projections here and there from its outer edge. On the background were spots and markings, some of which may, or may not, have been defects in the plate. In the discussion, I asked Mr. Maskell if this photograph were well authenticated, because, if genuine, it was unique in the histories of photography and meteorology; he then gave as his authority a number of a periodical, which he laid upon the table.

This photograph will soon draw criticism in wider fields than that in which it first became known, because there is none to compare therewith. The scientific world must guard itself against hoaxes performed, say, by "larky" young men—such as those who find pleasure in tying together the tails of farmers' cows—and, at the same time, ought, by experience, now to have wisdom enough not to howl down novelties brought before it in all candour by truthful persons. Scientific men at first scouted the first news of the existence of flying fish; the Royal Society itself rejected Franklin's first paper on lightning conductors; mesmerism was tabooed by orthodox science for a generation, and now is accepted by it in a cowardly way by forging for it the new name of hypnotism. A broader spirit of toleration is now abroad, for, the wiser men are, the more are they aware of their own ignorance: the ignorant and the brutal, on the contrary, are conscious that they know everything. On these grounds, probably, in scientific circles judgment will be suspended about Mr. Dunn's photograph, and time claimed for the reception of abundant corroboration from other sources, even should Mr. Dunn's acquaintances testify that he is not a notorious practical joker. In London one is at a disadvantage in knowing nothing of the source of information, for Mr. Dunn may perhaps be noted for the gravity of his demeanour and the trustworthiness of his utterances.

One thing, until explained away, appears to tell strongly against the picture being a photograph of globular lightning. The lens was uncapped, as usual when taking photographs of forked lightning by night, and after the flash Mr. Dunn put on the cap; thus no shutter was used, for shutters are useless in photographing forked lightning. Under these circumstances how is it the fire-ball comes out sharp all over and near the middle of the plate, instead of making a band across the plate by its travelling motion? Information has reached me that a copy of the photograph has reached the Royal Meteorological Society, and that additional specific particulars have been asked, but not yet received.

Until recently, it was an unpleasant thing to be a witness to an abnormal phenomenon which cannot be seen or repeated at will. When they asked the captain to come on deck and to look, with all the rest of the living souls on board, at the sea-serpent wriggling after the ship, that captain groaned, buried his head in the sofa cushions, and replied that he would die first. Did they not know that Captains Smith, Brown, and Robinson had testified to having seen the sea-serpent, and been thenceforth regarded by their employers and by their passengers as scarcely worth their salt?

Come we now to what is really known in relation to what the proletariat call thunderbolts. "Globe-lightning" or "fire-balls" present perplexing phenomena to electricians; but that globular lightning is a fact is not denied. The fire-ball is much less brilliant than forked lightning; indeed, it is rarely brighter than red-hot iron. Sometimes the ball is visible for several seconds; it is always spherical, and seldom more than a foot in diameter; it appears to fall from a thunder-cloud by its own gravity, sometimes rebounding after touching the ground. The fire-ball usually bursts with a bright flash and loud explosion, occasionally discharging flashes of lightning. No experimenter has yet succeeded in producing artificially anything resembling these natural and intensely charged Leyden jars. The term "thunderbolt" is nowadays rarely used except by poets and penny-a-liners. Such are the statements of Professor P. G. Tait about globular lightning.

W. H. Harrison.

AMERICAN NOTES AND NEWS.

Flowers by Gaslight.—The Cuban cactus is a species of the night blooming plant which, we are informed, only blooms at midnight. The *St. Louis and Canadian Photographer* has a photo-engraving of a group of these flowers, the negative of which was taken by a photographer in his gallery at midnight, with an exposure of about four and a half minutes to gaslight.

The "Dominion Illustrated."—We are sorry to hear of the stoppage of the *Dominion Illustrated*, a Canadian weekly of a high-class character, which depended very largely upon photography for its illustrations. The paper, it is said, will in future appear as a monthly. It is to be regretted that the measure of support accorded

to our contemporary should have led to this step. Can it be that the fidelity of the illustrations was not appreciated?

Aluminium Flashlight.—Dr. Piffard writes to *Anthony's Bulletin* in reference to the proposed substitution of aluminium for magnesium in flashlight photography, stating that he exhibited pictures made by aluminium flashlight at a meeting of the Society of Amateur Photographers of New York three or four years ago. He says that properly prepared aluminium is, for certain purposes, to be preferred to magnesium. It gives a quicker flash, but is very costly.

Photographing a Furnace.—Messrs. Meachim & Sabine, of Youngstown, Ohio, recently accomplished an interesting piece of work in photographing the bottom and interior of a Gerard furnace, the stack of which was seventy-five feet high, and the interior, of course, perfectly dark. An exposure of half an hour was given, with the camera upside down, and a successful negative resulted. We are not told what luminant supplied the actinism necessary for securing "perfectly dark interiors."

"An Appropriate Response."—The Columbus Camera Club held its annual meeting a little while ago, and, according to the report, it brought out the largest gathering the Club had had for three months. "Many faces of irregular attendants were present," we read. Only the faces? The Bausch and Lombe Lens and Shutter, won in a competition, was presented to the victor. This gentleman, Mr. H. Irvine, "responded appropriately, and *passed round the cigars.*" The appropriateness of the response was so highly appreciated by the members present that they subsequently elected Mr. Irvine a vice-president of the Club.

Death of Willard H. Fuller.—We are sorry to hear of the death of Mr. Willard H. Fuller, of the Scovill & Adams Co., New York, after a brief illness, at the age of thirty-seven. Mr. Fuller was long connected with the Scovill Manufacturing Co., and was much respected. The funeral was attended by, among others, Messrs. W. Irving Adams, and H. Littlejohn (Scovill & Co.), W. I. Lincoln Adams (*Photographic Times*), H. C. Price, H. Flammeng, Dr. Charles Ehrmann, and representatives of Messrs. E. and H. T. Anthony & Co., the Eagle Plate Company, and the Board of Trade and Transportation of New York. He leaves a widow and two young daughters.

"St. Blaise" Photographed.—The *Photographic Times* recently presented its readers with a capital photogravure of St. Blaise, the $100,000 stallion. The colour of the picture is said to suggest the colour of the horse, so that it is as satisfactory a representation as could possibly be obtained by photographic means. The breeder of the horse is said to have been "Lord Arlington." It was Lord Alington—without inverted commas. To say, as our contemporary does, that the animal won the English Derby as a three-year-old is in the nature of a redundancy, since, as everybody knows, only three-year-olds are allowed to compete in that classic contest. Then—but stay, this is not a sporting journal.

Rare Earths.—Mr. Waldron Shapleigh recently exhibited at the chemical section of the Franklin Institute a number of specimens of the salts of the rare earths, many of which, it is safe to say, are only known to the majority of chemists on paper, that is, in the text-books of chemistry. Of a few of these, however, such as zirconium, lanthanum, and cerium, it is claimed that they should no longer be classed as rare earths, as hundreds of tons of ores from which they are obtained are found in North Carolina; they also exist in Brazil. These, and similar bodies—of which, we believe, incandescent mantles are made—can, it is said, be supplied from the localities named in proportion to the demand created by the arts and manufactures.

Judging Lantern Slides.—A little while ago the Executive Committee of the American Lantern-slide Interchange met, and examined and tested the slides of fifteen clubs, aggregating very nearly 1400 slides! Fourteen hundred slides at a sitting! Phew! The self-doomed martyrs—we mean Committee—consisted of Messrs. F. C. Beach and W. H. Rau and Dr. G. H. Bartlett. It seems that on a previous occasion some of the clubs wished to know in detail why their slides were rejected. A code of reasons has, therefore, been adopted, by which the quality of a slide may be readily determined. Each rejected slide will be marked with a letter, which will indicate the following defects: (A) Too weak, flat, or over-exposed; (B) too dense, chalky, or under-exposed; (C) out of focus; (D) badly matted, aperture too large, or incorrectly labelled; (E) uninteresting subject. It would be a charity if this example were copied as far as possible in this country.

"The Beacon" on the New Methylated Spirits.—"Watchman," in the *Beacon*, has something to say on the New Methylated Spirit Regulations which strikes us as eminently sensible. After explaining that the addition of mineral naphtha makes the spirit altogether unsuitable for emulsion-making and other photographic purposes, he doubts whether the addition will deter the more degraded class of whisky-drinkers. He does not believe in depriving a whole people of its cakes and ale for the sins of the few, and says he would add to the spirit such poisonous matter as, while it would be fatal to the drunkard, would not interfere with its employment in science and the arts. The regulation has been adversely criticised all round. Who, we wonder, is the meddlesome ornament of the Laboratory at Somerset House that has doubled the unpopularity of the Inland Revenue among such a large section of Her Majesty's subjects?

GAS-REGULATOR CHECKS.

The following experiments, made to attain greater safety in the use of compressed oxygen, will probably be of interest to many readers of The British Journal of Photography.

When recently investigating, with Mr. Budenberg, of this city, some causes of explosions alleged to be due to, or assisted by, the use of gauges, we proved that, under the ordinary conditions of the use of compressed gas by lanternists, the presence of either gauge or regulator is not required to obtain ignition of combustible matter, for the ordinary connecting arrangements and stem of a regulator or gauge (without a check) are long enough to allow of the compression of sufficient heat to ignite tinder with compressed air only, and we infer that, with compressed pure oxygen, even a shorter tube would suffice. The experiments show that, with ordinary couplings attached to oily cylinder valves, there has been a source of danger which, although very real, happily has not made itself frequently apparent, and, no doubt, some explosions caused thereby have led to the gauges being condemned.

Therefore I have made a few experiments as to the practical value of inserting an efficient check in the entrance to a Clarkson's Duplex Regulator, and I find that, when it is arranged to pass gas under a high pressure at a slow speed, it permits enough to enter the regulator for three blow-through jets; but, with mixed jets of fairly large bore, $\frac{1}{17}$" (=No. 53 Lanc. steel-wire gauge) diameter, there was not enough for two jets to work at their best, although they had to pass their proportion of coal gas with the oxygen. I therefore opened the check (the Jackson Check being used, as the best I am acquainted with), so as to pass the oxygen more readily, but, at the same time, prevent such an inrush as would produce the ignition of oil in its liquid form, and found that abundance of oxygen was then obtained for two jets; but, when all three were acting together, there was a slight falling off in the light, although it is probable an ordinary non-critical assembly would not have perceived it. It is, however, seldom that all three jets are required to work at their full capacity at the same time, and, as those used are much larger than ordinary commercial jets, with the latter a full supply would be obtained, for they rarely exceed $\frac{1}{20}$" in the bore; a full supply would also be obtained for larger jets by opening the check a little more, and it would still maintain the necessary conditions for safety.

I am therefore led to the conclusion that users of single and biunial lanterns with blow-through jets, who probably form the majority of amateur lanternists, would be quite protected from the risk by adopting the Jackson Check in their regulators, and in fact in any tube stopped at the outer end intended to draw off high-pressure oxygen: the check should be placed in the nozzle close to the part in contact with the cylinder valve. Users of mixed jets, on screens up to eighteen feet square, can have a better light than is generally seen at lantern

entertainments with all three jets of a triple lantern in use together for effect slides, while with only two jets more gas is supplied than can be used.

The pressure in the oxygen cylinder during the earlier trials was about 90 atmos., and during the later trials about 30 atmos.; but no difference was perceptible on that account, in consequence of the regulator, for the check does not diminish the quantity of gas more than has been pointed out, and does not affect the pressure which is maintained even by the regulator. The recommendation to employ checks in regulators is not intended for exhibitors on twenty-five or thirty-feet screens, who have special jets and appliances, and use special care with everything. H. M. WHITEFIELD.

CELLULOID FILMS.

[A Communication to the West London Photographic Society.]

For many years past it has been a great aim in photography to substitute a lighter material than glass as a support for the sensitive film for negatives, and until the introduction of celluloid no substance was found to be capable of supplanting glass for the purpose.

Celluloid, as a new material in the arts, dates back to about the year 1869. It is a hard, durable substance, almost entirely unaffected by acids or alkalies, unchangeable under ordinary atmospheric conditions, and is very tough. It is rendered plastic by heat, and can be moulded into any desired form. Alcohol and acetic acid act upon it, partially dissolving it. It is soluble in acetate of amyl, forming a hard, transparent varnish. The manufacture of the celluloid sheets used in the preparation of negative films is somewhat as follows:—

A pile of pure white paper is acted upon by nitric and sulphuric acids, converting it into nitro-cellulose. It is washed to free it from the acids, and then treated with wood spirit and camphor, producing a jelly-like block, which is then subjected to great pressure, which is sustained for a period of several weeks. The block, from which most of the spirit is now evaporated, is put into a machine something like a planing machine, and is cut into shavings or sheets of the thickness of the film required; each shaving or sheet, which measures 60 × 20 inches, is now hung up to dry for a period of about three months, in order to thoroughly season it and prevent any after-change. Each sheet is then taken and rolled under heavy pressure between heated metal plates, to obliterate the marks of the cutting knife. The metal plates are either polished or grained, according to the surface required, the polished giving the smooth film and the grained the matt surface. Both kinds are used, but I much prefer the smooth, as those films which have the matt surface at the back take a little longer to print, and are also very liable to become scratched. They are, however, good for retouching. The gelatine emulsion is spread over the sheets by means of special appliances, and which produces a film of gelatino-bromide of silver of great uniformity. The emulsion is the same as that used in the preparation of dry plates, and the film, when dry, is precisely the same as a glass plate, with the exception that the support is celluloid instead of glass.

The great advantage of celluloid films is, of course, their lightness and portability. A dozen half-plate films, with their packing, weigh about four ounces, while the same number of glass plates will average three pounds, whilst, in thickness, one gross of films in packets will occupy four inches, and one gross of plates fourteen inches. There is, too, no fear of breakage, and halation, so common with glass plates, is almost entirely obviated by the use of films. The films can be kept flat for exposure in the dark slide by several means. I myself use carriers, which are light and inexpensive, consisting of cards with metal grooves at the ends. The films can be easily slipped into the grooves, and are then ready to place in the slide like glass plates. I have found them very effective. For very large sizes the plan adopted —first, I believe, by Mr. Warnerke—consists of sticking the films down upon a surface, which always remains tacky. This method is a very good one, but care must be taken to keep dust from the surface. I have used, with very great advantage, carriers which are slightly curved, as this form very materially aids even definition when using large stops in the lens.

The exposure required is the same as that for glass plates. I have found there is no difference whatever, whether the emulsion is coated upon glass or celluloid.

For development any of the usual developers are suitable, and the films will lie flat provided the bottom of the dish is first wetted. It is not necessary to wet the films previous to development, except for large sizes. They are fixed in the usual fixing bath, taking care that the edges do not curl up out of the solution and thereby escape fixing. The films when fixed are well washed, and then hung by small clip on a line to dry. Intensification or reduction can be effected without difficulty by means of any of the usual formulæ. The films can be easily varnished with a varnish that does not require heat in drying, such as amber in chloroform, or gold size thinned with benzole. The varnish is applied by means of a soft brush. A simple plan, however, which I have lately tried and which seems to be very simple and effective, is to dip the films after washing and before drying into a water varnish consisting of pale shellac dissolved in an aqueous solution of borax. This dries with a very hard impervious coating.

There are many useful applications to which celluloid films may be applied. In Moessard's cylindrograph, which takes panoramic pictures two or three feet in length, the films are inserted in a slide which is bent to form the segment of a circle. Another useful application is in making stereoscopic pictures. The stereoscopic negative can be cut with a pair of scissors, and the halves transposed and mounted upon glass, when the prints taken will not then require reversing. Very good cloud negatives can be made with the films which may be printed from either side. In cases where reversed negatives are required, as for carbon printing or collotype, a celluloid negative will be useful, and, although one does not get absolute sharpness by printing in the ordinary manner, it can be improved by placing the frame containing the negative at the bottom of a box, so as to cut off all oblique rays. By this means one can get sharp pictures. For focussing screens, too, the matt celluloid forms an excellent substitute for the ground glass.

I should like to say a word as to storage of negative films. They should be kept like plates in a dry place and away from gas fumes, but, above all, the films should not be subjected to too much pressure. On account of their being unbreakable, one is very apt in travelling to pile a great many things upon them, and this is often the cause of peculiar insensitive markings upon the negative. Captain Abney has pointed out that the effect of pressure upon a gelatino-bromide film is to destroy the sensitiveness of the parts pressed. And now, in conclusion, I hope the few hints I have given will prove of service during the coming season, when, no doubt, celluloid films will be very extensively used. J. D. ENGLAND.

THE PHOTOGRAPHIC SOCIETY'S LECTURES.—III.

PHOTOGRAPHY AS A BRANCH OF TECHNOLOGY.

THE invitation conveyed to me by your Council, to assist in promoting a scheme of photographic technical education of a more complete character than that provided by the elementary schools is in such complete accord with the principles which I have always held, and which I have occasionally promulgated through other channels, that I felt it an almost imperative duty to respond to the invitation, in spite of the numerous other claims upon my time, for I believe that, if the Photographic Society will throw itself with zeal into some well-organized scheme in this direction, a great benefit will be conferred upon the cause of technical education in this country. I will even go so far as to express the belief that a work of national importance may be accomplished.

THE DAWN OF PHOTOGRAPHY.

It may, perhaps, appear as preposterous to dwell upon the importance of photography before the members of this Society as it would be for a merchant to address the Chamber of Commerce on the importance of trade, or for a financier to lecture to an institute of bankers on the importance of banking. Nevertheless, it is a common experience that those who are actively engaged in the prosecution of some special kind of work often take a narrow view of their own labours; they have no time to take a bird's-eye view of the whole subject, and an independent outsider may sometimes do good service by gathering up the odds and ends of scattered observations, and fitting them into their right positions in the general plan. If any justification is required from me for addressing a Society composed so largely of photographic experts, I need only plead that, as a teacher of technical chemistry, I have felt it necessary to give full recognition to the claims of photography as an important branch of technology. It can no longer be ignored that photography has penetrated the arts and sciences to an extent that has raised it to an exalted position among technical subjects, and as such it has not yet received its proper recognition in this country. From the very dawn of its discovery, the importance of its applications was foreseen, although it is only in our own time that the realisation of this importance is being witnessed. We need not commit ourselves to the extravagance of Paul Delaroche, the artist, who, during the excitement caused by the revelation of the Daguerreotype process, is said to have declared, "Painting is dead from this day!" The art of the painter has not been killed, but it may fairly be claimed that it has been aided by photography; the art of the engraver has been revolutionised by its means. The prophetic utterance of a writer in the *Edinburgh Review* for January, 1843, has been fulfilled: "The art of photography, or photogeny, as it has been called, is indeed as great a step to the fine arts as the steam-engine was in the mechanical arts; and we

have no doubt that when its materials have become more sensitive, and its processes more certain, it will take the highest rank among the inventions of the present age."

All who are familiar with modern photographic methods will admit the truth of this prediction; the materials have been rendered more sensitive, and the processes more certain. The sensitiveness has been increased to a degree that would probably astonish the writer of the passage quoted, and the certainty of the processes is such that the amateur photographer exists by thousands. It is, perhaps, this last circumstance which is responsible for the identification of photography in the public mind with the taking of portraits and landscapes. These are, no doubt, very important applications of the subject, but photography is not synonymous with portraiture and the taking of scenery; if we allow this view of the subject to prevail, it cannot but have the effect of narrowing down the general estimate of its importance, and of thus injuring its claim to take high rank among technical subjects. We are here, I imagine, to proclaim the far-reaching importance of our subject. Every one knows with what beautiful effect the photographer can reproduce a portrait or a piece of scenery, but what is not so generally known to the public at large is the enormous service that photography has rendered to other branches of science. If I dwell, therefore, upon this application of the subject, it is not for the purpose of depreciating its application to art, but rather for the purpose of exalting both aspects.

Photography in Astronomy, Physics, and Chemistry.

The modern dry plate has insinuated itself into every branch of practical science; whenever a phenomenon of a temporary character has to be registered with absolute accuracy, where the human eye fails, owing to the faintness of the object or the rapidity with which the phenomenon occurs, there the aid of the dry plate is invoked. The application of photography to astronomy has, as is well known, relieved the eye of the astromoner and curtailed the work of the observatory to an extent bordering on the marvellous. A faint nebula, which by eye observation may take many years of wearying labour to represent in the form of a drawing, in the course of a few hours impresses its image in all its fineness of detail on the photographic plate—a memorial for future ages of the true form of the nebula at the time of its being photographed. Stars which appear as points of light in the telescope are shown by the photographic plate to be small nebulæ, and stars and nebulæ which have altogether eluded the most powerful telescopic search impress themselves on the sensitive film. All this and much more in the same direction is such familiar knowledge now, that it is only necessary to mention the facts, nor need I remind you how the photographic plate is being utilised for the photo-astrographic survey of the heavens, and in astronomical spectroscopy for the permanent registration of the solar spectrum and the spectra of the stars. The "Draper Memorial" is one of the latest examples of the utility of photography in the observatory; it is no exaggeration to say that one of the grandest problems of modern science —the question of stellar evolution—will be rendered capable of scientific discussion by this application of the gelatino-bromide film. The modern astronomical observatory is in fact equipped for photographic work quite as much as for observational work, and the photographer has become as necessary as the observer.

In physics and in chemistry also the photographic plate has been added to the weapons of research. Here it has been used to record phenomena which occur with such rapidity as to elude visual perception. What would the Edinburgh Reviewer of 1843 have thought of the possibility of photographing a soap film in the act of breaking, or a liquid drop in the act of falling? Yet, as you all know, Lord Rayleigh and Mr. Boys have succeeded in doing this. Or take, again, the application of the sensitive plate to the elucidation of the phenomena of gaseous explosions by Professor Oettingen, who, by using a rapidly rotating dry plate, was enabled to show the intermittent character of the flash produced by the explosion of hydrogen and oxygen. Professors Liveing and Dewar have also succeeded in photographing the spectrum of a mixture of exploding gases. In spectrum analysis, in fact, the services which have been rendered by photography cannot be over-estimated. The astronomer, the physicist, and the chemist must have for reference complete and accurate charts of the spectra of the chemical elements. The early maps of Bunsen and Kirchoff, and the splendid "Spectre Normale" of Angstrom were drawn by eye observation after years of laborious work, and with injury to the eyesight of the observers. These maps are now produced by photography without any tax upon the eyesight, and with an amount of detail that renders the early maps—executed with such painful labour—but mere skeletons as compared with their photographic representatives. The spectra can, moreover, be compared far more readily and with much greater accuracy by the photographic method. The method of eliminating the lines in the spectrum of one element, due to the presence of a trace of some other element as an impurity, which we owe to Professor Norman Lockyer, has only been rendered possible by photography. If the residual lines common to several elements, and which cannot be traced by this means to any known element, should lead to the discovery of new elements or to the resolution of known elements into simpler forms of matter, the credit must be given to the photographic method.

In Spectroscopy, Meteorology, and Geology.

But it will be safer to confine ourselves to what photography has actually done for science than to attempt to enter the regions of speculation. The case to be made out is such a good one that there is no need to draw upon the imagination. Thus, again, in the region of spectroscopy, the relationship between the constitutions of chemical compounds and their power of absorbing certain definite light waves, as investigated by Professor W. N. Hartley, may be said to have been discovered by means of photography, because the absorption is, in the case of colourless liquids, exerted beyond the limits of the visible spectrum. In meteorology the photographic plate has also been of the greatest service, and a British Association Committee has been formed for the purpose of stimulating work in this direction. Most of those present are, no doubt, familiar with the more striking results achieved by meteorological photographers. The fleeting forms of clouds can be registered with absolute fidelity, and, by an ingenious arrangement of electrically connected cameras, the height and rate of motion of clouds has recently been determined by the aid of photography. The character of the electric discharge in the laboratory has been studied photographically by Mr. Shelford Bidwell and by Professors Oliver Lodge and C. V. Boys, and the large-scale discharge of the lightning flash has been made to impress itself on the photographic plate. The results are known to all; the conventional zigzag "fork" appears to have no existence in nature. The destructive effects of wind storms on buildings can also be studied in photographs with an amount of accurate detail that it would be impossible to represent by any other method; and I am informed by Mr. G. J. Symons that important conclusions concerning the nature of the atmospheric movement have been arrived at by the examination of such photographs.

Passing on to other applications of photography, it is obvious that, in geographical and ethnological exploration, the camera has become an essential part of the traveller's equipment. In geology, again, the aid of the photographer has been called in, and with such good results that a British Association Committee has been called into existence, and has been doing excellent work in collecting and registering geological photographs during the last two or three years. In these photographs, sections are recorded with a fidelity which it would be impossible to equal except by laborious sketching. Where time is an object, as in the case of sections only temporarily exposed, the camera is invaluable. Moreover, the value of such photographs will increase with time, in the same way and for the same reason as the photographs of the starry heavens; for, while the latter, taken at the time of the present celestial survey, will, by comparison with photographs taken in the far distant future, reveal relative movements among the stars, the geological photographs of the present period will, by future comparison with the localities registered, furnish incontestable evidence of the slow course of geological change.

In Biology, Chronophotography, and Anthology.

In Biology photography has been utilised with great advantage, and will, no doubt, become of still greater service in the future. There is no reason why the dry plate, which has already largely superseded the eye in astronomy, should not also relieve the eye of the microscopist. Many biological works have been illustrated with great success by means of photo-micrography, and, even in purely systematic works, such, *e.g.*, as Marshall and De Nicéville's *Butterflies of India*, photographic illustration has been adopted with success. In studying microscopic forms of life, where an evanescent phase of life-history may be full of profound significance, the photographic plate might well replace the eye in those cases where prolonged and fatiguing observation has hitherto been found necessary. The fleeting phases of expression, of such importance in comparative psychology, have been caught and fixed on the photographic plate with a natural fidelity that it would have been impossible to attain without such aid. Mr. Darwin's work on *The Expression of the Emotions* was, as you are aware, illustrated by photography even before the dry plate had been worked up to its present exalted degree of sensitiveness.

The application of photography to the analysis of the movements of animals has been made familiar through the remarkable photographs which Mr. Muybridge has on many occasions brought under our notice in this country. Among other results recently achieved, I need only refer to those wonderful pictures of animals in motion, taken by Messrs. Marey

and Anschütz. Such results as these are not only interesting illustrations of the high state of perfection to which modern photography has been developed, but they are of the highest value in elucidating the mechanism of animal movement, and of the flight of birds. The introduction of photography into this branch of animal mechanics has led to a complete revision of pre-existing conventional notions, and the indirect effect of such photographic analysis of the phases of motion on the work of the artist is of an importance that cannot be over-estimated.*

In the department of Anthropology photography has served for the faithful registration of race types, and Mr. Francis Galton's method of composite portraiture is familiar to all. In his recent studies of "finger marks" in connexion with heredity, Mr. Galton has also found it indispensable to work from photographic enlargements.

This imperfect sketch of the scientific applications of photography might well be followed by a much more extended list of its achievements in the domain of art. But I do not feel myself justified in taking up more time in telling you what you already know, and there are no doubt many present who are far more competent to deal with this aspect of the subject than I am. I cannot help thinking, however, that it would materially help the cause of technical instruction in the desired direction if some competent authority among you were to draw up a complete statement of the benefits which have accrued to art, both abstract and applied, by the introduction of photographic and photo-mechanical methods.† RAPHAEL MELDOLA, F.R.S.

(*To be continued.*)

THE PHOTOGRAPHIC SURVEY OF WARWICKSHIRE.

A MEETING of the Photographic Survey Council of Warwickshire was held on Feb. 1st at the Colonnade Hotel, Mr. J. B. Stone (President) in the chair.

The President said that it had been something like a year and a half since the scheme of a photographic survey of the county was floated. It might appear to the outside world that nothing had been done and no progress had been made during the interval; but, on the contrary, in all directions most satisfactory labours had been bestowed on the work, which was so excellent that it would be impossible for him to find words to describe its character. It had been gratuitous and disinterested work, and was of such a high standard of excellence in itself, from the technical manner of production, that he ventured to say that the series of pictures that had been sent in were unequalled in any similar collection throughout the world. He did not speak without a very large experience of photographic work, and he believed they might safely challenge the whole world for local work such as had been sent in for the survey. The character of the objects portrayed was as varied as one could desire. They had archæological features in the form of hundreds of churches they valued and wished to preserve recollections of; they had old mansions, not only single views, but some of them taken from a dozen different positions, that preserved all their beauty; and, in addition, they had photographs of Warwickshire lanes, cottages, and peasantry, all so much associated with the works of Shakespeare and other writers who had made Warwickshire famous. The fact that these views were associated with the literature of the county would make them of enormous value to posterity. So far, the appeal to the voluntary efforts of distinguished amateur photographers in the county had been responded to so liberally, that they had received from he did not know how many contributors as many as 700 pictures for the collection. They would fill something like 500 frames, and it was proposed that they should all be mounted similarly, and placed in frames of one size, so that the collection would be a uniform one. He had already waited upon the Mayor, and he, with the greatest possible courtesy and willingness, at once adopted the suggestion that the photographs should be publicly accepted, and that there should be a formal public handing over of the views, which should be kept for reference. The Mayor, following out the idea, had consulted with the Free Libraries Committee, the Art Gallery Committee, and Mr. Whitworth Wallis, and it was now settled that there should be a public exhibition of the photographs in the Art Gallery during the spring and summer months.

Mr. J. H. Pickard announced that he had received letters from several amateurs and professional photographers offering to assist the council. He also stated that, although at the outset photographic societies in other towns in the county had promised assistance, no photographs whatever had been received from them, and the whole of the work had been done by the members of the Birmingham Photographic Society. It was further announced that an application had been made on behalf of the Birmingham Old Library, asking for a duplicate set of views, and offering to place at the disposal of the council, for the purposes of copying, a number of old local illustrations, &c., in the possession of the library.

Mr. Simkins, the curator, undertook the work of producing a catalogue descriptive of the photographs to be exhibited.

* Prof. Du Bois-Reymond deals with this in the address referred to. Some of Prof. Marey's recent results are described in *Nature*, vol. xlv. p. 228.

† Since the above was written, Professor E. du Bois-Reymond's address to the Royal Academy of Sciences of Berlin on "The Relation of Natural Science to Art" has appeared in *Nature*, vol. xlv. pp. 209 and 234.

Our Editorial Table.

THE PHOTOGRAPHER'S INDISPENSABLE MONTHLY (Adams & Co.) reappears after two months of suspended animation. The new Editor tells us that he has orders to avoid personalities. There is much wisdom in the order. As he elects to correct the printers' errors of his contemporaries, perhaps he will tell us what he means by giving the Harvard lens a "twenty-fourth aperture" (*sic*), and whether Mr. *Ram*, of Pennsylvania, should not read Mr. *Rau*. We are happy to recognise so many quotations from these columns in the *Indispensable*, but we should like to see them correctly printed, if even they are not acknowledged. Otherwise its pages are entertaining, and its advertisements a source of grievous temptation to buyers of apparatus, &c.

INSTRUCTION IN PHOTOGRAPHY.

By CAPTAIN W. DE W. ABNEY, C.B., F.R.S., &c.

WE are pleased to find that Messrs. Piper & Carter, 5, Furnival-street, E.C., have brought out a ninth edition of this standard work, in which everything has been brought up to date. Among the new matter introduced are "The Measurements of Densities of Negatives and Depth of Prints;" "On Lenses, Stops, and Pinholes;" "Artificial Lighting by Magnesium and Electricity." This differs from the previous editions in that the first place, as regards instruction, has been accorded to gelatine, collodion, which has hitherto occupied that position, being given a second place. We are glad to observe that the French system of weights and measures, which was given in the last edition, has been discarded, and "parts" substituted. The low price of the work places it within the reach of every one.

THE YEAR BOOK OF PHOTOGRAPHY.

Edited by T. C. HEPWORTH, F.C.S. London: Piper & Carter.

WITH the reins of our contemporary, the *Photographic News*, Mr. Hepworth also takes hold of those of its annual, the *Year Book*, which becomes more plethoric year by year. The one for 1892 before us contains many excellent articles by good writers, and a compendium by the Editor of the leading novelties of the past year. It is embellished by a collotype, printed by Thevoz & Co., from a negative by the Editor. It also contains a large number of advertisements.

TRADE CATALOGUES.

MCGHIE & CO., GLASGOW.—As the best got-up of those now before us, we select that of Messrs. McGhie & Co. for the first place. It contains 160 pages of well-selected, copiously illustrated, and nicely printed matter, in the form of descriptions of lenses, cameras, shutters, lamps, chemicals, and apparatus in general. All the requisites for fitting up the studio are here to be found.

D. NOAKES & SON, GREENWICH.—This is a lantern catalogue, and contains descriptions of the various lanterns and appliances made by this firm, together with a list of the slides kept in stock. This is prefaced by practical hints on the management of the lantern, written by members of the firm, which are replete with good common sense. We, however, question the prudence or good taste which leads them to reproduce a letter, which appeared in this JOURNAL about four years ago, criticising the award of the prize which had been given to a rival maker for his Docwra lantern. It looks as though they were seriously chagrined, and were taking the matter too much to heart.

LOEBER BROTHERS, NASSAU-STREET, NEW YORK.—Nothing shows more forcibly the operation of the high Customs tariff on European-made photographic goods than a comparison of the prices of identical productions in a good American and English price list. On the more important of the photographic imports this represents forty-five per cent., which, with other dues, brings the added price up to fifty per cent., and this, of course, must come eventually out of the pocket of the photographer. Much of the American apparatus is *sui generis*, and hence we never examine a well-illustrated catalogue emanating from the United States without acquiring new ideas as to design and construction. In cameras we find several designs with which we in this country are not familiar. The Book contains particulars of most of the better known lenses of European make, together with chemicals, plates, and accessories.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 941.—"Improvements in and Connected with Photographic Cameras." A. JEFFREY and G. WISHART.—*Dated January* 18, 1892.

No. 1199.—"An Improvement in Photographic Cameras." E. C. HAWKINS.—*Dated January* 21, 1892.

No. 1282.—"Improvements in the Fronts of Folding Photographic Cameras." W. H. THOMPSON and P. W. HUSBANDS.—*Dated January* 22, 1892.

No. 1463.—"Improvements in Automatic Photographing Apparatus." Communicated by A. Hahn. H. HAHN.—*Dated January* 25, 1892.

No. 1526.—"Improvements in Photographic Shutters." W. R. BAKER.—*Dated January* 26, 1892.

No. 1555.—"Improvements in Photographic Cameras." Communicated by V. Berteil. H. H. LAKE.—*Dated January* 26, 1892.

No. 1600.—"Improvements in the Mounts or Cases of Photographic Lenses." W. H. THOMPSON and L. COHEN.—*Dated January* 27, 1892.

No. 1622.—"An Optical Instrument or Apparatus for Producing Facial Contortions of or Similar Effects from Photographic or Other Portraits or Pictures or the like." A. L. ADAMS.—*Dated January* 27, 1892.

No. 1634.—"A New or Improved Photographic Camera, which, when closed, is Disguised in the Form of a Book or a Parcel." J. BRAINE.—*Dated January* 27, 1892.

No. 1681.—"A New or Improved Film Holder for Lantern Slides and Negatives." A. W. SCANLAN.—*Dated January* 28, 1892.

No. 1709.—"Improvements in or Relating to Apparatus for the Automatic Production of Photographs." Complete Specification. C. SASSE.—*Dated January* 28, 1892.

No. 1730.—"An Improved Photographic Camera." Complete specification. A. A. DEHORS.—*Dated January* 28, 1892.

PATENTS COMPLETED.

IMPROVEMENTS IN MOUNTS FOR PHOTOGRAPHIC PICTURES.

No. 20,770. JOHN REYNOLDS, 31, Fort-street, Brushfield-street, Spitalfields, Middlesex.—*January* 2, 1892.

THE object of this invention is to provide amateurs with a facile means of mounting their photographs, whether those having a glazed surface, or a "matt" surface, and, at the same time, to ensure that the glossy surface of the one, or the smooth, dead surface of the other, shall not be injured, as is now frequently the case when applying damp thereto in the act of mounting them.

To this end I construct mounts somewhat after the manner of photo-album leaves—that is, I prepare a piece of pasteboard, which is to form the frame, embossing, or otherwise ornamenting, the opening or openings which are to receive the pictures and present them to view. This frame I attach by gum, or other adhesive material, to a backing of pasteboard in such a manner that the inside edges of the opening or openings will be free of, or unattached to, the backing, and that one side or end of the pasteboard frame will be unattached, as is usual, to provide for the insertion of the picture.

A material difference between this mode of making the mount or album leaf is, that I omit the spacing-board which has hitherto been necessary to provide a space for the reception of the mounted picture.

The injury to the photograph above indicated is avoided by rendering it unnecessary to mount it upon a backing card prior to inserting it in place, and the omission of the spacing layer of cardboard ensures a proper grip of the inserted picture between the backing-board and the frame or mount.

IMPROVED PHOTOGRAPHIC PLATE WASHER.

No. 20,951. SAMUEL HENRY SMITH, 102, The Parade, Leamington Spa, Warwickshire.—*January* 2, 1892.

MY invention consists in improved apparatus for washing photographic negatives, my object being to secure in one apparatus, amongst others, the following principal advantages:—

1st. The washing of photographic negatives of one or various sizes in an inclined tank fitted with racks, in which the plates are placed with the sensitised films downwards.

2nd. In so arranging the water-supply pipe as that the incoming water shall splay upon the bottom of the inclined tank, and prevent the stripping of the film.

3rd. So mounting the syphon that the whole of the hyposulphite solution, which gravitates to the lowest corner of the tank, shall be discharged.

IMPROVEMENTS IN MAGIC LANTERN SLIDES.

No. 2165. GEORGE FREDERICK LUTTICKE, 23, Lansdowne-place, Brighton.—*January* 9, 1892.

MY invention refers to the construction and arrangement of jointed figures, or objects, for use in magic lanterns. The said figures, which, made of any suitable material, may be jointed in any suitable way, part, or parts, are, where necessary, provided with pins, or other suitable stops, regulating the extent of movement of the limbs or parts of the body. Part or parts may be pivoted to a platform, whilst other parts may be arranged to move by means of a fork at the end of a lever bar, or the like, moving a pin travelling in a slot, or by an equivalent contrivance. In order to cause one limb or part to impart motion to another, I may employ a connecting rod conveniently arranged, or I may form two parts or limbs in one piece, suitably pivoted to a convenient part of the body. When two or more figures are shown, I may connect one with another in any plausible way, for example, by a string, wire, or the like, and by that means effect a controlling action on the movements of the limbs, parts, or the figures themselves.

A weight or spring may be conveniently arranged to act on a jointed part or parts to cause or control motion.

I reserve to myself to use any suitable means for actuating the said figures.

The claims are:—1. In a magic-lantern slide, the combination of a figure or figures, or object or objects formed with articulated limbs or parts, and means for imparting differential or other movements to such limbs or parts substantially as herein shown and described. 2. In a magic-lantern slide, the combination of a figure or figures formed with articulated limbs or parts, and means for imparting differential or other movements to the body or bodies, and to such limbs or parts substantially as herein shown and described. 3. In a magic-lantern slide, the combination of a moving figure or figures formed with articulated limbs, or bodies, or other parts, means for connecting one moving part with another, or other means for imparting differential movements to a part or parts of the figure or figures, and means for connecting, and thus imparting, differential movements to other parts thereof substantially as herein shown and described. 4. In a magic-lantern slide, the combination of a moving figure or figures formed with articulated limbs or other parts, forked or other levers controlled by counterbalance weights or springs, for imparting differential movements to such limbs or parts, stops for limiting the movement of the levers, and means for giving motion to the figures substantially as herein shown and described. 5. In a magic-lantern slide, the combination of a moving figure or figures formed with articulated limbs or parts, springs, and stops for controlling the movements of the limbs upon the movement of the figure or figures, and means for giving motion to the figure or figures substantially as herein shown and described. 6. In a magic-lantern slide, a moving or other figure or object formed with articulated limbs or parts, forming two of such limbs or parts in one, so as to move upon one centre substantially as herein shown and described. 7. In a magic-lantern slide, the employment of springs or weights to act upon a jointed part or parts, to cause or control motion substantially as herein shown and described. 8. In a magic-lantern slide, the combination of a figure or other object formed with articulated limbs or parts, and stops for limiting the movements of such limbs or parts substantially as herein shown and described. 9. In a magic-lantern slide, the combination of a figure or other object formed with articulated limbs or parts, a pin or the like upon one part, a guide slot in a fixed object to receive the pin, and a forked lever or the like to give motion to such part substantially as herein shown and described. 10. In a magic-lantern slide, the peculiar arrangement of parts substantially as herein shown and described.

PHOTOGRAPH EXHIBITORS.

No. 19,911. CARL GUSTAF SODERSTROM, Sixteenth and Lawrence-streets, Denver, Arapahoe, Colorado, United States of America.—*January* 9, 1892.

MY invention relates to a novel form and construction of photograph exhibitors, and the object of my invention is to provide a device to take the place of photographic albums, or, at least, to answer every purpose of the album, while possessing many novel and interesting features entirely foreign to albums and picture receptacles heretofore used, so far as known to me.

The invention consists of a rotating frame located within a suitable chamber, and provided with pivoted radial arms adapted to grasp photographs, cards, or pictures, these arms being capable of such manipulation by depressing a key fitting over the axis of the frame that any picture, card, or photograph may be thrown upward and exposed to view, and retained in sight until the key is raised, when the arm returns automatically to the concealed position, when another picture may be seen by actuating another arm.

The device is designed to be located in a recess of suitable depth formed in the table, the foot of the frame being rigidly secured to the base plate or bottom of the recess, while the top of the table conceals the mechanism. In the centre of the top, however, is formed an opening for the insertion of the key, which, when first depressed, releases a spring-actuated arm, which rises to the vertical position, said arm carrying a contents card, upon which may be written the names of all the persons whose pictures are held by the device, and the corresponding numbers of each picture, since each arm is numbered, and after the pictures are arranged, the contents card is formed to correspond.

The arm carrying this card forms a portion of the top of the table when in a horizontal position, but when upraised leaves a slot therein; it is through this slot that the picture subsequently rises as the actuating key is used.

CAMERA CLUB.—The Retouching Classes meet on Wednesdays and Fridays at eight p.m.; Teacher, Mr. Redmond Barrett. February 1, Smoking Concert. 4, Mr. S. Herbert Fry will demonstrate *A New Enlarging Lantern* (*without Condensers*), and the Incandescent Gas Light Company's light will be shown. 8, Elementary Lecture No. 7, *Intensification and Reduction*, by Mr. Lyonel Clark. 11, Commander C. E. Gladstone, R.N., *Architecture in Normandy and Brittany*, with lantern illustrations. 15, evening for testing slides. 18, Mr. S. B. Webber, *Some Experiments in Orthochromatic Photography*. 22, Elementary Lecture No. 8, *Platinum Printing Methods*, with demonstration of developing and of printing platinotype by artificial light, by Messrs. G. Davison and E. J. Humphery. 25, Annual Meeting; Lantern Exhibition (pictures taken in Norway), by Mr. J. B. B. Wellington.

DUNEDIN PHOTOGRAPHIC SOCIETY, AND NELSON CAMERA CLUB, N.Z.—An exhibition of work by the above two Societies was held at Dunedin in November, and was open three weeks. This was the occasion of the Dunedin Photographic Society's second annual exhibition, and it was thought that, if the two Societies combined in exhibiting, a healthy emulation would be created, and the cause of art prospered. These expectations have been realised, and it is intended that in future the two Societies will give material assistance at each other's exhibitions, and other Societies will be invited to join. The total number of exhibits was 191, of which Dunedin contributed 142, and Nelson the balance. Silver printing seems to be the favourite method of the Dunedin Society, nearly all of the exhibits being silver prints. Nelson, on the other hand, affects platinum and bromide printing. Every description of subject was represented on the walls, from scenery, pure and simple, to portraiture.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
February 8	Darlington	Trevelyan Hotel, Darlington.
" 8	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
" 8	Lantern Society	20, Hanover-square.
" 8	Norfolk and Norwich	Bell Hotel, Norwich.
" 8	North Middlesex	Jubilee Hall, Hornsey-road, N.
" 9	Brighton (Annual)	Arch 40A, King's-road, Brighton.
" 9	Derby	Smith's Restaurant, Victoria-street
" 9	Great Britain (Annual)	50, Great Russell-st., Bloomsbury.
" 9	Manchester Amateur	Lecture Hall, Athenæum.
" 9	Newcastle-on-Tyne & N. Counties	Mosley-st. Café, Newcastle-on-Tyne.
" 9	Paisley	Committee Rm., Free Lib. & Museum
" 9	Stockton	Masonic Court, High-street.
" 10	Ipswich	Art Gallery, Ipswich.
" 10	Leicester and Leicestershire	Mayor's Parlour, Old Town Hall.
" 10	Munster	School of Art, Nelson-place, Cork.
" 10	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 10	Putney	High-street, Putney.
" 10	Reading	
" 10	Stockport	Mechanics' Institute, Stockport.
" 11	Birkenhead Photo. Association	Association Rooms, Price-street.
" 11	Birmingham	Lecture Room, Midland Institute.
" 11	Bradford Photo. Society	50, Godwin-street, Bradford.
" 11	Camera Club	Charing-cross-road, W.C.
" 11	Cheltenham	
" 11	Hackney	Morley Hall, Triangle, Hackney.
" 11	London and Provincial	Champion Hotel, 15, Aldersgate-st.
" 11	Manchester Photo. Society	28, George-street, Manchester.
" 11	North Kent	Gravesend.
" 11	Oldham	Lyceum, Union-street, Oldham.
" 12	Cardiff	
" 12	Holborn	
" 12	Maidstone	"The Palace," Maidstone.
" 12	Ireland (Annual)	Rooms, 15, Dawson-street, Dublin.
" 12	Richmond	Greyhound Hotel, Richmond.
" 12	West London	Lec. Hall, Broadway, Hammersmith

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

FEBRUARY 2,—Mr. J. Spiller, F.C.S., in the chair.

Professor Meldola's lecture, *Photography as a Branch of Technology* [see page 87], was read by Mr. A. MACKIE, in the unavoidable absence of Professor Meldola through illness and a domestic bereavement.

The CHAIRMAN regretted the absence of Professor Meldola, who was one of the leading technical professors. The paper was one of national importance. Referring to Mr Warnerke's recent lecture on *Photo-Technical Education on the Continent*, he said that there were no such institutions to be compared to those in Vienna and Berlin in this country. He instanced the difficulty of gaining instruction in collotype work, facilities for which did not exist. In preparing the paper, Professor Meldola had conferred a high compliment on the Society, and he moved that the best thanks of the Society be awarded to him, coupled with regret and sympathy with him in the sad circumstances that prevented his attendance.

Mr. W. REDFORD seconded the motion, which was carried unanimously. The lecture was in accord with the principles laid down by Mr. Bolas, on which technological instruction should be given. The difficulty was to find competent teachers, as many experts did not understand the underlying scientific principles. Even if lecturers could not themselves produce good work, yet, by pointing to better examples, they might in time raise men who would become capable teachers. The affiliation scheme promised to do something in this direction, and Professor Meldola's advice would be of great assistance to the delegates in their deliberations. He hoped the affiliation would lead to some such result as Professor Meldola desired.

Mr. W. England, Mr. A. M. Levy, Mr. W. H. Harrison, and Mr. J. R. Gotz agreed with many of the points raised in the lecture, the latter emphasising the necessity of a knowledge of photography in surgery and pathology.

Mr. H. M. ELDER had the advantage of Professor Meldola's personal assistance, and had assisted him in preparing the lecture. He supported the suggestion for the foundation of an Institute, and instanced the work carried on by the City and Guilds of London Institute as going on well, thanks to Professor Meldola and others. For the Institute they wanted good men as teachers, and their object should be to turn out, not elementary prize-winners, but thoroughly capable men, qualified to undertake the scientific departments of manufacturing businesses. If the Photographic Society of Great Britain set itself to the labour, in five or ten years they might establish a good teaching Institute.

Mr. S. T. CHANG said that fifteen years ago, in China, he commenced work in the collodion process. No facilities for instruction existed there, as people seemed to be afraid of photography; but it was now becoming widely introduced, on account of dry plates.

Mr. A. MACKIE said that, if the attendances at the lectures had not been what were anticipated, the one they had just heard repaid the Committee for the labour expended. He thought many members under rated the importance of the affiliation movement. He considered its main object should be to create a central institution, where members of Societies could meet and exchange ideas.

The meeting then closed.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 28,—Mr. A. Cowan in the chair.

Messrs. G. Austin and E. Milner were unanimously elected members of the Association.

The HON. SECRETARY having referred to a suggestion made that the Photographic Societies should move in the matter of the new methylated spirit, the CHAIRMAN mentioned that the subject had been brought before the Photographic Society of Great Britain at its last meeting.

Mr. G. W. ATKINS then moved, and Mr. L. MEDLAND seconded, "That this Association has heard with satisfaction that the Photographic Society of Great Britain has it in contemplation to represent to the authorities that the present regulations with regard to the sale and use of methylated spirits unfavourably affect photographers, and the members hope that the matter will be brought forward as speedily as possible."

The resolution was carried unanimously.

Mr. J. R. GOTZ exhibited his new film carriers, for use in the ordinary dark slide. He also showed several of the new Zeiss lenses constructed by Suter, of Basle, under special licence from Zeiss. Up to the present there were only three licensees, Voigtlander being one, and Suter the only non-German house, so far as he (Mr. Gotz) was aware. He thought that the lenses were a step in advance of the aplanatic system of Steinheil. Having reviewed the constructions of various doublets since that time, he remarked that Suter was the first exponent of the new Jena glass. He figured the curves of one of the Series III. lenses, and also gave the radii, mentioning that baryta crown, silicate crown, and light flint were used in the elements. The Jena people made at least a hundred different kinds of glass, and also exactly the same kinds as those made by Chance. The new glasses were of entirely new metal. In reference to the construction of these lenses, he said that the licensees bound themselves not to depart from the forms covered by Zeiss's patent.

Mr. W. E. DEBENHAM said he had examined one of the Zeiss anastigmats, and found it really a wide-angle lens, as wide as many lenses professing to be wide angle. With a focus of eight and a half inches, it covered a circle of fifteen inches, which was as much as people could expect from a wide-angle lens. It was a trifle more rapid than most rapid symmetrical or rapid rectilinears. It also had a most remarkable flatness of field. He had tested it for flatness of field against a rapid doublet lens of double the length of focus by a well-known maker. The field of the latter should have been flatter than that of the anastigmat; but, on tracing the respective images on a twelve-inch plate, the anastigmat gave sharpness up to within an eighth of an inch from the margin, and the rapid doublet to within a greater distance from the edges. He had formed his opinion from actual measurements made while another person focussed. These lenses were the greatest advance in photographic optics since the introduction of Steinheil's aplanats twenty-four years ago.

Mr. GOTZ explained the flatness of field by the fact that two components of the lenses were of silicate crown and light flint, which gave exceedingly small dispersion.

After a brief discussion on the well-worn subject of the best "backing" for plates,

Mr. J. S. TRAPP said he had tried the addition of acetic acid to the gallic acid developer for weakly printed gelatino-chloride prints, as suggested by Mr. Debenham. The solution produced much inferior results.

Mr. F. A. BRIDGE remarked that acetic and gallic acids were awkward to mix together. Acetic acid was one of the most treacherous things that could be used. He thought it unsafe to trust to one sample.

Mr. DEBENHAM advised the use of citric acid instead of acetic.

The meeting shortly afterwards closed.

Camera Club.—January 28, Sir George Prescott in the chair.—Mr. Haes showed a manuscript believed to be in Daguerre's handwriting, which had been discovered amongst Dr. Loewe's papers. The manuscript is a brief set of directions for Daguerreotype photography, and is marked and signed in Dr. Loewe's handwriting, "Received from Mr. Daguerre in the year 1840." The document, mounted between glass, will be exhibited in the club-rooms for about a fortnight. The Hon. Secretary exhibited a photo-electrotype, lent by Mr. Henry Sutton, showing the perfection to which the process had been brought. Mr. Gale then commenced showing his pictures, dividing the series into sets, illustrating various classes of landscape and country life. The slides were produced both on gelatine and on wet-collodion plates. Mr. Henry Stevens showed pictures of flowers, home groups, and some new studies of packs of hounds in the field, which were very fine. Other pictures were exhibited by Messrs. Cunningham, Noel-Cox, Elder, Sworder, H. E. Davis, Hess, Spencer, and Mills, and the evening concluded with some slides by Mr. Bingley, lent by Mr. W. England. On Thursday, February 11, Commander C. E. Gladstone, R.N., will lecture on *Architecture in Normandy and Brittany*, and the subject will be illustrated with lantern slides.

Hackney Photographic Society.—January 29.—The Autocopyist Company, London-wall, gave a demonstration of the Photo-autocopyist. The principle on which the process was worked was of the lithographic kind, but much simplified. After getting one print (about the depth of platinotype), a number could easily be obtained without daylight—a great consideration this weather. Mr. Clarke, of the Incandescent Light Company, Westminster, demonstrated the working of their light for lantern work. A very brilliant light was obtained, and a number of the members' slides were put through the lantern by the Hon. Secretary. The safety of the light was amply demonstrated by the bursting of a bag, the most serious thing which, it was stated, could happen. A slight explosion was, however, all that took place. The Hon. Secretary announced that the next meeting was on February 11, when Mr. T. C. Hepworth would give a lecture.

West London Photographic Society.—January 29, the President in the chair.—The meeting was called for the purpose of considering the report of a Committee appointed to examine the Chiswick School of Art, with respect to its suitability as headquarters for the Society in place of the Hall at Hammersmith. The Committee's report was adopted. A resolution to change the place of meeting forthwith was proposed by Mr. WHITCAR. An amendment to defer any change till the end of the present session was moved by Mr. LESLIE SELBY. The amendment was lost by 16 to 8. Mr. Whitcar's resolution was carried by 16 to 5. The Society will, therefore, in future, hold its meetings at Chiswick. The next meeting, however, on February 12, will be

held at Hammersmith. A resolution to hold social meetings was carried, details to be settled by the Council.

Putney Photographic Society.—January 30, Rev. L. Macdona in the chair.—Demonstration of the new film enlarging method—*Cresco Fylma*—of Messrs. Hill Brothers & Freeman, who, besides having on view numerous prints and opal enlargements, demonstrated practically the few manipulations necessary to produce the enlargement. The process, while working more readily with transparencies, is also most satisfactory in the case of negatives, the gradual growth of the film being very remarkable. Contrary to expectation, no particular care is necessary either in the transfer of the film, or in any of the subsequent operations. Mr. A. R. Dresser, being unfortunately invalided, had sent a written paper on *Hand Cameras* (second lecture of the series on "Photography"), which, having been read by the Chairman, a large number of enlargements from quarter-plate hand-camera negatives were handed round. These were mostly on Fry's "Roughest" (late "Naturalistic") bromide paper, and toned with uranium. Following these, some eighty slides were exhibited. A set of American slides, brought by Mr. A. Ovey, concluded the evening.

Richmond Camera Club.—January 29.—Mr. CEMBRANO (the President) gave some practical instruction in the *Manipulation of the Optical Lantern*. He spoke of the different illuminants—oil, gas, and electricity—describing the various lamps in general use, and the principles and details of the oxyhydrogen light with the blow-through and mixed jets. The various parts of the lantern were clearly explained, and the differences in detail to be found in the principal makes commented upon. Finally Mr. Cembrano, with the Club lantern, illustrated practically the process of centering and regulating the light and all other details of manipulation.

Bath Photographic Society.—January 27, Mr. W. Pumphrey, President, in the chair.—Messrs. E. J. Appleby and H. A. Wilkins were appointed auditors of the Treasurer's accounts. Mr. E. J. APPLEBY then spoke on the subject of rodinal, which he believed was a derivative of coal tar, a strongly alkaline solution of para-amidophenol. He had made a number of comparative tests, varying the percentage of dilution, as against pyrogallol methods. These were handed round for inspection, and showed rodinal to give less plucky negatives than pyrogallol. Mr. Appleby also drew attention to a number of transparent positives developed with the new agent; here excellence of quality was manifest. The members were invited to test rodinal and report their experience at the next meeting, samples being handed them for that purpose by Mr. Appleby. The HON. SECRETARY (Mr. Middleton Ashman) said his first trial of rodinal showed over-exposure, and subsequent tests pointed to the necessity of a restraining agent being present; then plucky negatives could be obtained. Its behaviour in the case of transparent positives left little to be desired—indeed, in the near future gelatine plates and rodinal developer would be the best method of making lantern slides. The CHAIRMAN spoke of some wonderful cloud effects he had recently seen in photographs produced by a new form of shutter, details of which were promised for the following meeting. Mr. JOHN DUGDALE exhibited a selection of lantern slides he had produced by the wet-collodion process, from negatives comprising views of the fleet and racing yachts, of Gibraltar, Malta, Siam, Switzerland, &c. These were shown by means of a Keevil prismatic lantern and self-registering carrier operated by Mr. Davis.

Liverpool Amateur Photographic Association.—January 28, Mr. Paul Lange in the chair.—Mr. LANGE thanked the members for the loyal support they had given him during the two years he had presided over the Society, and vacated the chair in favour of the new President (Mr. William Tomkinson), who had a very flattering reception. In the course of a short address, Mr. TOMKINSON expressed the hope that the Society would very soon be possessed of more commodious club-rooms, when it was his wish to give an "At home" to the members and their friends. He also expressed his intention of endeavouring to extend the work of the Association, particularly in the way of instruction for beginners, and of using every effort to make the Society as successful under his presidency as it had been under that of Mr. Lange, to whom he proposed a very hearty vote of thanks, which was carried with acclamation. The Chairman then introduced Mr. T. S. TAYLOR (Taylor, Taylor, & Hobson), of Leicester, who gave a lecture on *The Design and Use of Photographic Lenses*, illustrated by experiments and diagrams with the optical lantern. The lecturer afterwards gave full and lucid replies to questions asked by various members. In reply to Mr. Lange, he stated that no advantage beyond that of variety was secured by the employment of Jena glass in the manufacture of photographic lenses, although it was of some advantage in telescopic work.

Sheffield Camera Club.—January 27, Annual Meeting.—After the report, which was a satisfactory one, and showed an increase in membership, was read, the following officers were elected for the ensuing year:—*President:* Mr. G. E. Maleham.—*Vice-Presidents:* Messrs. Morton and Rawson; *Council:* Professor Arnold, Dr. E. Skinner, Messrs. Newsholme, Strangways, Copley, and Ellinor.—*Treasurer:* Mr. B. W. Winder.—*Secretary:* Mr. W. Gilley, jun.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

THE TELESCOPIC-PHOTOGRAPHIC LENS.

To the EDITOR.

SIR,—I, too, am content to leave the matter where it stands. I may, however, mention that the chief part of Dr. Schroeder's *résumé* refers to the "positive method" incorporated in the "photo-heliograph." Instruments of this form have been supplied by my firm many years ago to the Greenwich, Kew, and South Kensington Observatories, as well as to many other colonial and foreign-government observatories. Dr. Schroeder makes, with regard to the "negative method," reference to the employment of a negative lens, which I concur in believing to have been invented by Barlow. This, too, is in connexion with observatory work.

As the matter now savours too much of the nature of a "trade" discussion between myself and another firm of opticians, and Dr. Schroeder, the optician to that firm, I think with you, sir, that the matter had better be left "where it stands," as you say, in that this course will save both your space and my time, so that any further controversy, if necessary, can be settled in another place.

It remains only to state that the most recent works on the optics of photography have come from the pens of such men as Dr. Charles Fabre, M. Wallon, Dr. Eder, and Dr. Schroeder himself, and in none of these works is reference made to a photographic lens such as I have constructed.—I am, yours, &c., THOMAS R. DALLMEYER.

25, *Newman-street, London, W., February* 2, 1892.

FORENSIC IDENTIFICATION.

To the EDITOR.

SIR,—The other day I was looking through the back volumes of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC in search of Mr. Byrne's beautiful portrait of the Princess Victoria of Teck when I came across an article on "Forensic Identification," which, professing to treat the subject from a purely photographic standpoint, is obviously a thinly veiled endeavour to rehabilitate the exploded criminal imposture which, nearly a quarter of a century ago, sought to palm off a vulgar Wagga-Wagga butcher as an English baronet. Photography has rarely been prostituted to a baser use. On the "visual proof" of a couple of dodged "exemplars," in which the portrait of the real Sir Roger, who disappeared nearly forty years ago, is conjoined with that of the Claimant, taken at the time of the trial, with a result about as trustworthy as the photographic "Choice Blends" given in the first number of Mr. Jerome's new serial, the *Idler*, the man in the street, the final Court of Appeal nowadays, is left to find a verdict that the unhappy "nobleman" who languished on Dartmoor is the victim of "an absolute miscarriage of justice." The judicial decision in the case, we are told, was based on contradictory evidence. Most decisions in criminal cases are. If the evidence of rogues and detectives were always in agreement the administration of the law would be greatly simplified. The fact that the Claimant was ignorant of the name of his own mother is as naught against "anthropological admeasurements." You have only to get portraits of Smith and Jones, cut them in two, and "conjoin" half of Smith to half of Jones, and the jury's course is clear. If the anthropological admeasurements (whatever they may be) yield absolute identity, there you are. If not, you can easily solve the discrepancy by explaining that the nose of one of them had at some time been broken, and "the whole integument had shrunk." In a word, the "geometric" method of measuring compound noses is infallible. Smith may assert that he is Jones, or deny that he is Brown, but take a snap shot at Jones or Brown, conjoin half of the counterfeit presentment with a moiety of Smith's, take anthropological admeasurements, by placing the resulting print behind the wires of a birdcage, and you have evidence which outweighs any unfavourable conclusions depending on the accused's inability to remember the very last things a human being would be likely to forget. Thus, an impostor, claiming to have been educated at Stonyhurst College, when asked to look at a Greek grammar, may hold it, in sheer ignorance, upside down; he may live in sordid poverty in Australia, oblivious of his balance of thousands at Glyn's; being an English aristocrat he may have, on his return from the Antipodes, a burning curiosity to investigate the family affairs of the Ortons at Wapping; he may have lived a long time in Paris, quite familiar with the French language, and yet remember not a word of it some years later; and he may have been indelibly tattooed by two of his fellow-students at college, and yet be unable to show any trace of the operation when unexpectedly called upon to show the decorated arm. All these, and a host of other circumstances, all pointing to one conclusion, go for nothing with people who saw in the Claimant just the man fitted to become Member for Stoke; who were eager to believe in the innocence of Mr. Stead's hero, Lipski, and who were clear, two months ago, that the Hargreave jewels were certainly not stolen by Mrs. Osborne.

In this year's issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC we have "More about Identification by Photography," and from the same source. The writer, who, with comical unconsciousness, associates himself with that arch-impostor, Dr. Pangloss, A.S.S., gushes in gratitude to Fortune and to a country journalist, who seems to have taken him seriously. And he proceeds to strengthen and establish his position by further "disclosures." With the aid of a "recently devised identiscope" he has noted some peculiar markings on the Tichborne portraits. These markings, "artistic in type," are only "very dimly visible to unassisted

sight;" and, when pointed out to sympathetic personal friends, some saw, and others thought they saw, what was pointed out to them, while some, less discerning, saw nothing but the ordinary characteristics of a photograph. Even that "foremost friend" of the Claimant, Dr. Kenealy, could see nothing; Miss Kenealy "certainly saw what was pointed out to her;" Mr. G. Onslow, another devoted friend of the "incarcerated person," intervened with "Don't move any more in the mark on the nose." Again, "he who should best be cognisant of the matter knew nothing about it;" and then, we learn, "the whole question was consigned to the tomb of the Capulets." But the apologist of fraud, though "nearly reduced to a minority of one," is by no means content to leave it in that sepulchre. The monument of the Capulets, to him as to Romeo, is "Gorged with the dearest morsel of the earth," and, like Romeo, he applies the crowbar. He disinters the "diapered convolutes of needle-punctures," which Sir Roger knows nothing about, and which nobody else can see. In no wise discouraged, the modern Pangloss considers himself in "a position to sustain his primary allegation that there exists on the face of the Claimant the vestiges of a wrought-out design of some elegance." By next year we may hope that the identiscope will have identified fresh elegancies in a personage who, when I saw him in Westminster Hall, a score of years since, hardly appeared rich in personal fascination. Possibly, in the Almanac for 1893, a sly sense of humour may again offer the apologist "an open door," through which, dimly visible to unassisted sight, amused readers may discern that the Claimant, like Katisha in the *Mikado*, combines with a plain face "a left shoulder-blade that is a miracle of loveliness."—I am, yours, &c., T. H. W.

February 1, 1892.

RATIO OF GRADATION.

To the Editor.

Sir,—Under the above title, Mr. James R. Hopwood brings forward, in an article appearing in The British Journal of Photography of January 22, the contention of Messrs. Hurter & Driffield, that no developer, nor any alterations in the constituent parts of any developer, will effect an alteration in the ratio of gradation which can be developed in a plate which has had a certain exposure. Mr. Hopwood states, and no doubt states correctly, that this conclusion of Messrs. Hurter & Driffield "has so far remained a dead letter to the ordinary photographer, who consequently believes, and maintains, the exact contrary."

It is certainly strange that some of the many competent experimentalists in photography, who hold an opinion contrary to that of Messrs. Hurter & Driffield, should not have made and published the results of experiments to justify their view; but, beyond the expression of opinion at a meeting of one of the London societies last year, there appears to be very little to which an appeal can be made by the "ordinary photographer" as a reason for believing and maintaining the exact contrary to the statement that development cannot effect any variation in the "ratio of gradation."

Of that little, however, an example may be cited which, unless contradicted or explained away, would seem to be sufficiently good ground for holding to what has always been the accepted view of photographers in general, and one might add the usual experience of most people during development of a series of plates, especially if those plates have been exposed on landscape subjects. The example in question is a paper by Captain Abney, in the *Year-book of Photography* for 1880, page 127. Captain Abney there describes a method for developing plates which have been exposed on subjects having great contrasts, such, for instance, as a snow-mountain in sunshine, together with dark pine trees in the shade, and for the present purpose the important statement contained in that paper is that the author exposed two plates under practically identical conditions, for equal times, upon the same subject, and by applying different methods of development to each, obtained such a wide difference in the ratio of gradation that in the one case the mountain was almost lost in the sky, and the pine trees showed practically no detail; whereas in the other, not only did the mountain stand out from the sky, but even a fleecy cloud hanging to its side showed in the print, and also there was detail in the pine trees. Such being the facts, which are hardly likely to be disputed, and if they are, can very easily be verified, it is difficult to see how any explanation can make them square with Messrs. Hurter & Driffield's contention, for it is obviously futile to say that really the gradations are the same in both negatives, and that longer printing, or some other means, would make this apparent; and if, for the sake of argument (and for that only) it be admitted that in both negatives a scale of gradations, from, perhaps, clear glass to opacity, may be found, yet it is clear that the same objects in each will occupy very different relative positions in that scale.

Mutatis mutandis, this is the experience of most photographers, and as this striking dissimilarity in results has, for the most part, been made apparent to them by experience in out-of-door photography, though it may be unscientific, yet it may be useful to suggest that Messrs. Hurter & Driffield should, by experiment with negatives not exposed beneath a sensitometer, but to an ordinary landscape, see if, under those conditions, an alteration of the developer will not alter the ratio of gradation, or perhaps they may thus arrive at an explanation which may reconcile the two contentions.

Until lately it seemed possible that an explanation might be found in the phenomenon of reversal. For instance, it might be contended that in landscape photography the high lights were sometimes so much over-exposed that partial reversal had begun, and that such plates were alone susceptible of being altered in ratio of gradation by alterations of the developer; but recently it has been asserted by workers on the Continent that even with plates exposed beneath a sensitometer, under all the precautions to ensure equality of exposure which can be taken in a laboratory, a totally different scale of gradation may be obtained by applying to one plate an ordinary developer, and to a similarly exposed one a *very* dilute developer, and allowing it a longer time (more than an hour) to act. In the first case, the early numbers of a Warnerke's sensitometer were of almost equal blackness, that is to say, the steps in the scale of gradation at that end were abrupt, whereas, in the latter case, the scale of gradation was much more regular, this being especially apparent in the squares of the early numbers.

Of course this experiment with plates exposed beneath a sensitometer gives results directly contrary to those arrived at by Messrs. Hurter & Driffield; but, on the other hand, the result is exactly analagous to that which Captain Abney has put on record in the paper cited above, and it is only what one would have expected, for the methods of development were also analogous.—I am, yours, &c., M. J. Michael.

Davos Platz, St. Moritz, January 25, 1892.

URANIUM TONING, ETC.

To the Editor.

Sir,—For several years past I have used uranium for intensifying negatives, and also toning lantern slides. Some negatives done in this way eleven years ago are as good as ever, which, I think, is a fair proof of permanency. I have recently tried the newer formula, using acid; in the old method no acid was used. I find that, using acid, the plates become a green colour, which renders them useless for lantern slides. This, I find, disappears if a hypo bath is used after toning, but then the slides become a red of a most objectionable tint; this is the same whether the hypo be acid or not. Soda or potash removes it, but not until the proper red tone is gone as well.

Now, the acid, however, has one great advantage, and that is, that the slides tone more evenly than without it, and there is better control of the colour. Is this green colour inseparable from the acid solution when used for plates? It does not seem to come with bromide paper. One word more on another subject. Some of the few slides I have, on gelatino-chloride plates, have nearly faded away; others, made at the same time and treated in exactly the same way, are all right. I do not think this looks promising for chloride paper, which is coming so much into use.—I am, yours, &c., H. G. M. Contbeark.

The Hut, Ingatestone, January 28, 1892.

MIDLAND COUNTIES POSTAL PHOTOGRAPHIC SOCIETY.

To the Editor.

Sir,—I write to strongly support Mr. Bankart's scheme for the formation of a *Midland Counties Postal Photographic Society*. I have long been privileged to see and to admire the magnificent work done by Mr. Bankart, and I have profited not less from his criticisms upon my own work and that of others, than from his own photographs and descriptions of his own methods. With Mr. Bankart as the moving spirit the success of the proposed Society is assured.

I write now mainly to urge every earnest amateur in the Midlands to send his name and address to Mr. Bankart (West Walk, Leicester), in order that the Society may at once be established.—I am, yours, &c.,

W. Jerome Harrison.

Science Laboratory, Icknield-street, Birmingham, January 29, 1892.

A PLEA FOR FAIR PRICES.

To the Editor.

Sir,—Will you permit me to inform your very able correspondent, C. Ernest Barnes (January 8, page 2), that this Association of professional photographers has been specially formed for the purpose (among others) of dealing in a practical and business fashion with the evils and abuses of which he complains (price-cutting, enlarging for private persons at trade prices, &c., and other existing anomalies)?

I respectfully doubt if any "*syndicate of photographers*" could, as he suggests, deal so effectually with the malpractices of the trade as an Association like ours, provided it receives what is absolutely necessary for its efficient working, viz., a large measure of support in names and subscriptions from the profession which is to be benefited thereby. I shall be glad to receive the names of new members as soon as possible.

The annual meeting will be held at Anderton's Hotel, Fleet-street, London, Thursday, February 11, 1892, at half-past seven p.m., when *all*

professional photographers, whether members or not, will be heartily welcomed by the Council.—I am, yours, &c., D. J. O'NEILL,
Secretary, National Association of Professional Photographers of Great Britain and Ireland.
47, *Charlotte-road, Birmingham.*

"HAS PHOTOGRAPHY BENEFITED ARTISTS?"

To the EDITOR.

SIR,—There has been some rather lame argument upon the subject of art and its application to photography, but your correspondent of January 8, in the latter half of his letter, actually cuts off the sound supports of his argument, and substitutes crutches—very wooden one. It cannot be urged that photographers forget the credit due to the makers of plates, lenses, &c. Let any trade catalogue be examined, and in the majority of instances it will be found that Mr. So-and-So acknowledges lenses, cameras, plates, paper, or some other manufacture in the production of an exhibition picture. But, supposing this to be insufficient, let us give the argument another application. Let us ask to see something after the following attached to pictures in the Academy:—"Mr. Pallette wishes to acknowledge the great assistance rendered by the following gentlemen in the production of his picture. He has to thank Messrs. Wedg & Fraam for the canvas, the texture of this beautiful fabric giving an appearance of detail so much admired. To Mr. Pigments he is indebted for excellent colours, medium, varnish, &c.; and to Messrs. Hogsare & Cammile for their splendid brushes and pencils. He is furthermore *partly* indebted to Nature for his ideas." This, however, cannot be the end, for we shall want to see an acknowledgment to a modern master in conjunction with several old masters for the education and cultivation of style, and shall probably finish by insisting upon an acknowledgment of the intelligence, and right to exist, that allows an artist to be educated, or allows him to *be*.

Most art writers of any account emphasise the desirability of humility in the study of nature and art. Your correspondent evidently recognises the principle, without its personal application, for, while quarrelling with photographers for calling themselves artists, he calmly signs himself, "Artist with Brush, Pencil, and *Camera*." "What's in a name?" Does your correspondent know of none who base their claim to be called artists upon an ability to daub? And does he, like the majority of artists, wish us to accompany him down into the slums, that he may point with the finger at our lowest representative, and say, with withering scorn, "And you call this art?"

If *sight* can come under the heading of brain power, there must be a little exerted in producing an instantaneous study (unless "study" means an accidental result); and, if practical men may be believed, there is even a little credit due to the successful posing of actors and actresses.

Truly there is little or nothing to prevent a painter making use of photography. A few mechanical difficulties, perhaps—mere nothings. Photography is already supposed to yield the best results in the hands of an artist (be he painter or photographer), so there was really no necessity for the question upon this point; but, surely, if there be any question as to the monopoly of the credit of photography, it must fall to the photographer. Who else? Who but the photographer has brought photography to its present stage, and who but he shall carry it beyond? As far as the *art* side is concerned, we *may* have something to thank the painter for (especially if he be sufficiently muddled to claim the ownership of first principles), but we thank him only for what he himself has borrowed.—I am, yours, &c., H. COLEBROOK.
Plumstead, S.E.

To the EDITOR.

SIR,—In your correspondence column recently, "An Artist with Brush, Pencil, and Camera," reverts to the much-vexed question, "Has Photography benefited Artists?" I have written two or three times to your journal with the intention of showing that it has; others have done the same, and one might think the matter settled by this time; but it will never be allowed to rest as long as people allow themselves to be swayed by prejudice and envy instead of reason. Though myself an artist, I must confess that most of the bigotry and uncharitableness comes from our side; my experience of photographers is not that they are humptious and claim too much for their profession, but rather the reverse. Your correspondent thinks the time is not far distant when photographers will have to qualify themselves as artists, or "take a back seat." I tell him that the time has arrived; for the front seats are occupied by men who are fully competent, not only in taste, but also in technical art education, and even ability with the brush and pencil. Why do "artists" display such snobbism as to pretend to ignore this fact? These men are more than fully qualified to practise art—photography they know as much about the school of art subjects as many artists themselves, although such knowledge is less indispensable to them. The humorous touch in the hypothetical advertisement for a clever operator, where, among other duties, he is supposed to "nurse the baby and wash the pots," &c., may be laughable, but it is extremely far-fetched; in fact, I felt sure anything of the sort never was demanded of any operator. It seems to me a piece of high-handed superciliousness to suggest it. Artists are not cheap, but photography has done much to bring a great deal of artistic enjoyment within the reach of the multitude. Certainly artists are at liberty to practise photography, in fact they do so, both openly and surreptitiously, though with less concealment than formerly. I knew an artist some twenty years ago, who found it "did not pay" to be associated in business with a photographer; so the partnership was dissolved, and this was because his paintings were regarded with the suspicion that they owed something to photography, which they did not, for he was positively afraid of employing it. Nowadays one sees many pictures in exhibitions which are unmistakably copied from photographs, and why not? Art is long, and a short cut is a desideratum: no fear of getting too soon to the end of the road.

The difference between the two paths is this: In painting, a man can call himself an artist as soon as he can make a passable image of something; but in photography his hardihood would be a theme for mockery if he pretended to be an artist on such simple grounds. A ten-and-six-penny camera might enable the most inexperienced boy to produce a picture which, in point of correctness of drawing, would beat the embryo painter's work into a cocked hat; but would the boy therefore seriously claim the title of "artist?" It is unnecessary for me, in this letter, to recommence the definition of the words "art" and "artist;" it has been done most exhaustively in your pages. Artists, in the best and truest sense, are necessarily always rare, but there is a class just below that which is very popular and useful, and quite able to hold its own against the sneers of the envious. Of the first class there are scarcely half-a-dozen in a century; the second comprises all them that are able to produce pictures that please, even though they do not greatly elevate the mind, and there are many photographers that may be included therein. As to the relative difficulty of the work, what does that matter? We admire some works for the cleverness displayed in their execution, and others for their beauty and interest, without thinking much about how they were done; and this is generally the case in respect to the very highest art—our minds are too much occupied with the æsthetic and intellectual emotion afforded to let us even wish to poke our noses behind the scenes; and this pleasure, we feel, is not merely due to the perception of a display of "model, free-hand, geometry, and perspective," nay, nor even of anatomy. These are but the apparel, the "trappings and the suits" of art, which may exist in many mediums, not excepting photography.

Your correspondent asks if there is any credit in getting a good pose of a clever actor or actress, by which he implies that he or she supplies the pose, that is a help; but it requires the artist's eye to select a good view of that pose and to determine what proportion the figure shall bear to the picture, and whereabouts it shall be placed. I am not called upon to speak further about the lighting of it, or composing it together with other figures or accessories. What I deplore is the grudging way in which some artists regard the works of photographers, and their affected superiority. Why, I have known photographers who could draw and paint extremely well, and would have been welcomed in artistic circles, but that the profession of photography disqualified them. It is a pity that painters, who could afford to be magnanimous, should show such littleness and spite. I never heard a photographer speak of painting without admiration and respect, and the hostility I have observed comes from the other side; but I suspect it is from neither the first nor the second class of which I have spoken, but from the mere camp followers, the skirts and rabble of the army—persons who can only make crude images of things and fail altogether to breathe into them the fire of expression, whose best performances are inferior to the most mechanically evolved photograph, and infinitely inferior to one that contains sentiment, thought, or story.—I am, yours, &c., F. WILCOCKSON.
London, January, 1892.

IMPRESSIONISTIC PHOTOGRAPHY.

To the EDITOR.

SIR,—Will you allow me, as a working painter (painter-artist, I ought perhaps to say), occasional photographer, and constant reader of your valuable paper, to thank you for the pleasure and amusement the article signed "A. R. S." in your last issue has given me.

I take up your paper, as a rule, for the purpose of studying serious and scientific articles, never expecting to find anything of a humorous nature in your columns. I have been, however, agreeably disappointed. I allude to "A. R. S.'s" letter. It is unnecessary to take this letter *seriatim*.

Is every other line meant to be a joke, or is it, do you think, only by accident that there is that appearance? Why is the writer so hard on the poor photographer? and why is the poor student required to watch a "suitable landscape" for a "few months?" why should the photographer leave off his business to learn that of the etcher and the water-colour painter? and why should the poor student, after studying his "six months" efforts, be required to kick his camera—his "lying camera," forsooth, to the zenith, wherever that may be—and then go a-stone breaking, or learn golf? Why all these things? and are they appropriate to a paper exclusively devoted to photography?

The writer of this article, Mr. A. R. S., somehow reminds me of a certain other writer who, once upon a time, being desirous of learning something of a certain subject, wrote a book thereon, and afterwards, having learnt something about his subject somewhat publicly, withdrew his work; but, then, though the principles of that work were, to say the least, quaint, the grammar was passable. Thus your correspondent, being also possibly anxious to learn and to know, endeavours to attain his ends by abusing everything that he knows little of, and laying down the law about what he knows less of, so that the information given to him in the form of correction may be useful at other times as the basis of more humorous letters; but why; oh, why, does "A. R. S." use the expression, "thus showing how the fool is ever discovering himself for the benefit of the multitude?"—I am, yours, &c.,

London, February 1, 1892. ONE OF THE MULTITUDE.

ARTISTS AND PHOTOGRAPHY.

To the EDITOR.

SIR,—I was glad to read your all too brief "Art Notes" of January 29, as it seemed to me, as a very humble student of photography in relation to art, that those notes contained one or two home truths, the contemplation of which cannot but have the most salutary effects upon photographers and artists alike.

You instance some of the frames in the late Pall Mall Exhibition as eliciting universal condemnation. True, sir, they did; and such condemnation I hope as will prevent the admission of such monstrosities in future. The only gleam of comfort in that miserable business is that (*vide* the Civic frame to the portrait of Kaiser Wilhelm) photographers are not the only sinners in this respect.

Mr. C. P. Sainton, if he reads the JOURNAL (which I believe he does), will find it difficult to answer your question. This gentleman is a friend and pupil of Mr. Mortimer Menpes, whom your contributor, "A. R. S.," tells us uses photography as a basis for art. True for you, "A. R. S." "Charlatan and impostor" are the only words which correctly apply to such practices.

Go on, Mr. Editor; "picture-frame making," "charlatanry," and "imposture" are rife in the world of photography as well as in that of "art," and I hope you will continue your "Notes," and let in a little light upon these dark places.—I am, yours, &c., CHARLES BROWN, JUN.

Theydon Bois, Essex, February 1, 1892.

P.S.—I think I can guess who "A. R. S." really is; "the voice is the voice of Jacob," &c.

CAMERA CLUB CONFERENCE.

To the EDITOR.

SIR,—Will you kindly announce that the annual conference organized by the Camera Club will take place at the Society of Arts under the presidency of Captain Abney during the last week of March next? The arrangements of former years will be slightly extended so as to secure an evening meeting in addition to the day meetings for the reading of papers.

The exact dates and outline of the arrangements are as follows: Monday, March 21, 8 p.m., Smoking concert, and the opening of the Members' Annual Exhibition of Photographs at the Club. Tuesday, March 23, 3 p.m. Opening of the Conference by the President. Papers will be read and discussed until 6 p.m. At 8 p.m. the Conference will again assemble and sit till 10 p.m. Wednesday, March 23, Conference from 3 to 6 p.m. Annual dinner at 7.30 p.m., Thursday, March 24, 8 p.m. Special lantern exhibition at the Society of Arts for members and friends.—I am, yours, &c., G. DAVISON, *Hon. Sec.*

Camera Club, Charing Cross-road, W.C.

DINNER OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

To the EDITOR.

SIR,—Permit me to remind the members of the above Society and their friends who wish to be present at the dinner (on Monday, February 8), that immediate application should be made for tickets to myself, or the Assistant Secretary, 50, Great Russell-street, W.C.—I am, yours, &c.,

W. ENGLAND.

7, St. James's-square, Notting Hill, W., February 3, 1892.

WATER AND FILTERS.

To the EDITOR.

SIR,—Since penning the few lines to you about "Tylar's Filters," I have had a very interesting experience about the purity of filtered water. I have been residing for the last fortnight at a Hampshire watering-place, famed for its mild climate and pure water. I noticed that the water supplied at the table savoured of rain. This led me to inquire if the house had a rain-water tank. The reply was no, and that all the water supplied at table was carefully filtered. I was induced to test the filtered and unfiltered samples; the result was very much in favour of the *unfiltered*. Another proof of the theory I have long held that to filter the water as supplied by the various companies is a "snare and a delusion" to do so, means that one filters good water through a mass of impurities.

I am pleased for Mr. Tylar's compliment; I cannot have "carped" at the price, for the simple reason that I do not know Mr. Tylar's price; but I would like to know where the novelty or improvement comes in. Mr. Tylar evidently does not know that some months since I exhibited the filter at the London and Provincial Photographic Association, and I then stated its disadvantages.—Yours, &c., A. L. HENDERSON.

"*The Paragon*," *Bournemouth.*

LOSS OF DENSITY IN FIXING.

To the EDITOR.

SIR,—A great many things have been asked lately from the dry-plate manufacturers, such as backing, marking, &c., all of which involve trouble, time, and expense, and it would be cruel to add something more to those more or less just demands. What I would ask from them is much easier to obtain, and would certainly be to their own good as well as to their would-be customers, if not the old ones. It is simply a printed line on the label, and the directions, something like this: "The plates *do not lose much* (or *lose rather much*) during fixing in the hypo."

I have never found a plate being any worse because it loses more in the hypo (of its intensity) than another that loses less, provided I knew it before developing. All I had to do was to develop a little longer, and everything was right. A little over-developing does not matter; the negative is a little harder to print, which is not a defect. But suppose one does not know, and develops a new brand of plates, and finds that in the hypo almost all melts away, and he has a thin negative, no good to print from. Look at the trouble of intensifying, &c., if it brings out anything decent. I am of the opinion that a good many so-called under-exposed pictures are simply not enough developed to suit the extra loss in hypo, and certainly a somewhat under-exposed negative will lose much more in the hypo than a fully exposed one, the same as a print on albumen paper from a hard negative has to be printed much deeper to counterbalance loss of intensity in gold and hypo baths. Now, if we should know that a plate loses more or less in the hypo, we could develop accordingly, and save a great many negatives, and not always blame for it the manufacturer and the exposure.

I have been trying lately some different plates, and found them very very much to loss of strength in hypo, and so much so as to be worthless, however fully developed, as compared with my regular run of plates. When a friend asks me to develop a plate for him, my only question is, "Does your plate lose much in the hypo?" If you do not know of this, try it once upon two different plates (manufacturers), and you will see for yourself, pushing both to the same density first, and from instantaneous exposures, both to make things even and sure.—I am, yours, &c., ALBERT LEVY.

Asnières, France, January 26, 1892.

PREVENTION OF BLISTERS.

To the EDITOR.

SIR,—I notice there are a great many bits of information and experiments given for the prevention of blisters occurring with albumenised papers. At the beginning of the winter I commenced using albumen paper (the first time for many years) and the first batch I did was nearly ruined by the paper blistering. Some years ago the same thing occurred, and I then tried if I could not get rid of what I looked upon as a great nuisance. I succeeded, and am now doing as I did then, and I am not troubled with blisters. If any of your readers will try the following, I do not think they will be troubled again. Printing, washing, and toning is carried on as usual up to the fixing, and then I make a bath-hypo, one to eight, and for one gallon of this I add two ounces methylated spirits and two drachms ammonia, ·880.—I am, yours, &c.,

Redcar, January 25, 1892. R. J. BURNS.

Exchange Column.

**** No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR,' 2, *York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," 2, *York-street, Covent Garden, London.*

LLIAN.—Apply to the Autotype Company.

CYMRY.—Acetic acid is a solvent of gelatine.

A. H. B.—Presumably after the prints are washed.

LENS.—It is a single landscape lens of the ordinary type.

A. H. S. B.—The method you propose is the best for the purpose.

A. C. T.—You will find the formulæ of all the plate-makers collated in the current ALMANAC.

RIPON.—We had a series of articles on photographic enamels in our last volume, to which we refer you.

RUDOLPH LEONHARDT.—1. We fear there is no remedy. 2. Thin sheets of gelatine would answer the purpose.

R. M. C.—1. *The History of Photography*, by W. Jerome Harrison. 2. We cannot trace the article under that title.

NOVICE (Henley).—Messrs. Thevoz' pictures are, we believe, done by the collotype process, on specially chosen papers.

H. HERBERT.—If the plates give too much density with the developer recommended by the makers, reduce the proportion of pyrogallic acid.

R. C. T.—If the picture is copyright, it is illegal to copy it, even if the copies are not sold. You seem to be labouring under a misapprehension.

W. R. KENNAN.—If you refer to Suiter's gauges, we do not know the address of the manufacturers, but the gauge may be obtained of any dealer in lantern requisites.

C. H.—The photographs would have been better if they were more plucky; but we have seen many by professional photographers which were inferior to those sent.

WILLIAM CHAPMAN.—The patent is, we believe, still in force, but you had better consult a patent agent as to the possible risks of infringement involved in your improvements.

AG_2 BR.—The reason for your developer working slowly of late is undoubtedly due to the fact that the solutions were at too low a temperature. All chemical action is retarded by cold.

B. J. BARCLAY.—If the ready-sensitised paper shows minute spots before it is printed, and they become larger and metallic when toned, there is no way of avoiding them in the finished pictures, except by using a different paper.

C. J. KIRK and F. C. BEACHAM.—There is no directory of photographers published, but the *Chemical Directory* (published by Kelly & Co., Great Queen-street, W.C.) gives a list of all the photographers in the United Kingdom.

CAMBS.—1. Swan's patent for carbon printing was taken early in the year 1864. 2. The patent has long since expired. 3. No licence whatever required. 4. We are not aware if a fresh edition is likely to be published shortly.

C. W.—We are unable to inform you if the saying, "Something has gone wrong with the works," originated with the automatic photograph machines. Is your query intended, as the late Artemus Ward would say, to be "sarkistic?"

THOMAS A. ROGERS.—Pinhole photography forms the subject of several short articles in the JOURNAL during the last few years, which may be found on reference to the various indices. We are not aware of any separate publication devoted to it.

R. WOOD.—Your friend was partly right and partly wrong. The platinic salts are, undoubtedly, sensitive to—that is, decomposed by—light, but the change is not visible in the cold-bath process, or any other platinum process. It is the persalt of iron which is acted on.

A. VOSS.—In working the wet-collodion process, a ruby light is not at all necessary. A couple of thicknesses of orange "tammy," over a window facing north, will be all that is requisite. Two thicknesses of canary medium, or possibly one, might suffice under similar conditions.

EXPERIMENTALIST.—There is no difficulty in coating plates with gelatine emulsion without a "proper machine." All the early plates were coated by hand. Indeed, some makers, we believe, do so still. A little practice is all that is required to obtain an even coating, and that is soon acquired.

CAPTAIN HEMMING, R.E.—The aniline process of Willis will answer your purpose. Full details will be found in our JOURNAL of 1865, or in the volumes about that date. J. R. Gotz supplies paper which will serve the same purpose. "Ink photos" are printed from a grained lithographic stone.

BOSTO.—If an image the same size as the original cannot be obtained sharp in the camera, it is clear that it does not expand sufficiently. Are you aware that, to obtain a picture of the same dimensions as the original, the camera must be distended to twice the focal length of the lens, whatever that may be?

S. A. W.—1. A lens of the "rapid" type will be the most useful for your work. 2. If a wide-angle lens of the same focus as a "rapid" be used on the same-size plate, the angle included will be the same. 3. The wide-angle will cover the plate best when used with a medium stop. 4. We have not heard the rumour.

X. X.—We have had no experience with vessels coated with Aspinal'a Enamel for gold toning solutions; we much prefer to use glass or earthenware dishes in our own practice, and recommend you to do the same. A few days' use will, however, prove if the enamel has any injurious action on the solution. You might give it a trial.

W. ABBOTT.—The maker of the lens, whoever he may be, has attempted more than he could accomplish—that is, if he did attempt it. A lens of four inches in diameter, and five and a half inches focus, to take a full-length cabinet portrait with the open aperture, is more than an English optician would attempt. Such a lens, if it would do that, would be necessarily very rapid.

A. FRASER.—A great deal of success in Woodburytype printing depends upon the paper used. After preparation, it requires very heavy rolling between highly polished plates, and this necessitates expensive appliances. We are not aware that the paper, ready for use, is an article of commerce in this country, though, we believe, it is in Germany. You might, however, communicate with the firms who work Woodburytype; they may supply it, for aught we know.

A. W.—You are quite right in your surmise. The dryer carbon tissue is made after sensitising, the longer it will keep. Indeed, if it be thoroughly desiccated, and kept so, it will remain soluble for months. But its moisture must be restored before it can be printed upon, and the difficulty in the way is to introduce the proper proportion—neither more nor less. Upon the right hygroscopic conditions of the tissue depends, in great measure, success, or otherwise, in carbon printing.

D. ASHBEY says he recently applied to three prominent photographers to take negatives of his sisters, and hand them to him, he being an amateur, and could make the prints himself. He asks if this is the custom with first-class photographers, and adds "that, if it is so, it is very unfair, as no one wishes to pay a large price for what they can do quite as well themselves, at a trifling cost."—Of course, every one can arrange his own terms for business, photographers amongst others, and we believe the custom is as our correspondent suggests. It is hardly to be expected that an artist will expend his time and skill to secure first-class negatives, and then hand them over to the sitter to get printed elsewhere, perhaps very indifferently. It is to the prints that the artist looks for remuneration, not from taking the negative.

H. B. A. says he has a plot of ground large enough for building a studio twenty-two feet by twelve and a half feet, facing north, and asks how to build to, without using stone, so as to obtain first-class portraits therein? As a north aspect can be obtained, we should advise the roof to be on the "lean-to" principle, and glazed about two-thirds its height, or up to about thirteen feet. Each end sides and roof, for about feet six inches, should be made of opaque material. The structure may be of wood, and such as a horticultural builder would construct. Twelve or fifteen inches will be wide enough for the panes of glass. Twenty-two feet is rather short for a studio where "first-class" results are desired, as it will necessitate the use of short-focus lenses when full-length figures or groups are required. In such cases short-focus lenses are not consistent with first-class pictures.

PHOTOGRAPHIC CLUB.—February 10, *Glass Blowing for the Laboratory*, Mr. A. Haddon. 17, *Public Exhibitions*, F. P. Cembrano, jun.

LOW PRICE OF SILVER.—On Tuesday last bar silver fell to 41⅞, at which figure it was bought for India. It is stated that this is the lowest price on record. On the same day Mexican dollars fell to 40¼.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—February 8, Annual Dinner, at Café Royal, Regent-street, at half-past six p.m. February 9, Annual General Meeting, at eight p.m. February 23, Technical Meeting, *The Relative Merits of Different Processes for the Production of Lantern Slides.*

THE ANTIPHOTON.—From Messrs. A. R. Wormald & Co., of Sutton, Surrey, we have received the Antiphoton, which, when fixed in the wall of the dark room, permits a free passage of air from outside, while it excludes daylight. It is of thin metal, and its uses will indicate its construction. For the purposes assigned it should prove efficient.

NORTH LONDON SOCIETY'S FIXTURES.—February 16 (Technical), *Uranium Toning*, Mr. J. Weir Brown. March 1, *Platinotype Printing*, Mr. J. Martin. March 15, Lantern slide competition. April 5, Technical Meeting (Apparatus, &c.). April 19, Exhibition of Lantern Slides. May 3, *Light Measurement*, Mr. W. Bishop. May 17, Mr. J. Traill Taylor. June 7, *Retouching*, Mr. Redmond Barrett.

ROCHDALE AND DISTRICT PHOTOGRAPHIC SOCIETY.—The Exhibition of the above was brought to a close on Saturday, January 30, after a very successful run. The Lantern Evenings from members' slides were a great attraction. On Tuesday evening a *Conversazione* and Musical Entertainment was given, consisting of lantern exhibitions, songs, and recitals. Mr. Harry Fletcher had the sole charge of the lantern.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1658. Vol. XXXIX.—FEBRUARY 12, 1892.

A PHOTOGRAPHIC INSTITUTE.

During the session of the Photographic Society of Great Britain that has just closed, three papers were read which have a close bearing upon a matter which so many members of the Society, and others, have at heart, namely, the establishment of a central institution affording instruction by qualified professors in the higher technology of photography. No definitive scheme has to our knowledge yet been put forth; but, so far as we can assimilate all that has been written and said on the subject, the general aim is to provide facilities for the prosecution of experimental work and the study of particular branches of applied photography, the theory and the practice being placed equally at command of the student, so that both intending professors and practical experts might have the advantage of deriving their knowledge from a properly constituted and efficiently equipped teaching centre.

Taken in the order in which they were read the three papers we have referred to constitute an admirable introduction to a study of the whole question. Mr. Warnerke's description of the photo-technical schools in Belgium, Germany, Austria, and Russia lays before us in a succinct form the facilities which exist in the capitals of those countries for the acquirement of a theoretical and practical knowledge of photographic technology. The establishments are under Government control, and are presided over by such men as Vogel and Eder. The fees are moderate, and, especially in the Berlin and Vienna Institutes, the courses of studies are arranged upon a scale of completeness which it would be difficult to excel. We have no doubt that in any scheme for a photographic institute which may afterwards take shape in this country, the particulars which Mr. Warnerke has gathered together will be of the greatest utility in forming a guide to the needs of such an establishment. The second paper to which we are alluding was contributed by Mr. Bolas. In it he pleaded for facilities for experimental work, to such as might wish to do it, in the view of establishing general principles, and the establishment of regular courses of instruction by competent teachers. The third paper, by Professor Meldola, after pointing out the value which photography has been found to have in modern scientific work, concerns itself with the claims of photography to be placed on the same basis as other branches of technology, and goes on to argue in favour of an institute dispensing technological instruction.

We are happy to see that the Professor ignores the trite advice which is usually given at the outset of any educational scheme, namely, to apply to the public treasury for help. The hope that Parliament would vouchsafe assistance in the matter would not be worth entertaining. His suggestions are of a far more practical nature. He points out that the staff of the institute need not be numerous at first; a chemist, an optician, a physicist, an expert in photo-mechanical processes, and an artist would represent the chief departments, and he proposes a conference of all photographic societies, with the object of forming a joint committee, under whose authority a further appeal might be made for public and private support. He furthermore points out that, as elementary photography is being taught all over the country, a few first-class specialists might be enlisted to give short courses or demonstrations to those affiliated societies or centres which desired such instruction.

This, as we have said, is practical advice, the soundness of which we hasten to recognise. Professor Meldola's lecture, as our readers will see, is a very long one, and its interest is in proportion to its length. It contains matter for serious and careful reflection, to which on the present occasion we can do no more than make but brief reference. We join with him in the hope that any action taken by the Society will be of the highest possible character. The institute will need to take a somewhat lofty aim. The higher specialisation to which such a body should devote itself must be supplementary to the elementary instruction which is now being so extensively disseminated. It is this higher specialisation which, as the Professor effectively maintains, is in some danger of neglect just now. A photographic institute, therefore, should do more than impart a mere elementary knowledge of principles and practice to the student; it should take the latter in hand when he has mastered the groundwork of his subject, and give him the opportunity of acquiring that deep and intimate knowledge of it—in short, make a well-trained specialist of him—which alone can fit him to hold his own against his foreign competitors in modern photographic progress.

To the idea of a technological institute, so ably outlined and pleaded for by Messrs. Warnerke, Bolas, and Professor Meldola, we give our heartiest support, in the hope of seeing it realised, and the desire to assist in its accomplishment. It needs no very intimate acquaintance with the internal economy of English manufactures at this time to be aware that the demand for thoroughly competent technologists—men skilled in the theoretical and practical principles of optical and chemical preparations—are just now far from being at a discount, while the possibilities open to them in the larger worlds of science, the arts, and the manufactures are very great. In course of time, when competition becomes keener, as it inevitably must, and the power of knowledge will be the one power above all others that will make itself felt, the success or failure of photographic manufactures will be determined by the skill or incompetency of those by whom they will be conducted; and a technological institute that provides facilities for the acquirement of such knowledge will be a valuable factor in assisting this country to maintain its pride of place in the world of photography.

In the Continental institutes, of which we have spoken above, the study of photo-mechanical printing processes is an object of special attention. It is a matter of common notoriety that in this department of photography we, in this country, are, in far too many respects, not equal to our neighbours. Instruction in this field, as was pointed out in the course of the short discussion which followed Professor Meldola's lecture, is difficult, if not impossible, to obtain, except, of course, under payment of very high sums of money, so that here the institute may at once step in and supply a long-felt want with incalculable advantage. If, in addition to purely technological matters, such as the study and application of chemical principles, optics, and process work, conjoined to the innumerable subdivisions into which the production of photographs is split up, studio work generally, embracing lighting and posing, were included, the ordinary run of portrait photographers, as a body, would not improbably derive considerable benefits from the scheme.

We do not, however, gather that this forms part of the aspirations of those who have the foundation of such an institute at heart, although, if example be taken from the Continent, work in the studio could not be neglected. As to the "artist" whom Professor Meldola would give charge of a department, we fear that here the only debatable part of the scheme is touched. It would be wise, for the present at any rate, to eliminate this section from any plan, inchoate or experimental, until there was a more common agreement among the photographic public as to the meaning and application of "art" in relation to photography. Just now, every one has his own pet idea on the subject. We could easily select professors or teachers of photographic chemistry, of photographic printing, and the like; but, of recognised teachers of "art" in this connexion, there is no plethora, and therefore we hope the scheme will fight shy of including art teaching in its curriculum.

For the rest, we congratulate photographers that, at a moment when the cry for technical education is rising up from every branch of the community, their own special needs are enlisting attention, and in after-years we hope to have the pleasure of feeling that the three papers of which we have made mention constituted the starting-point of a successful scheme of photo-technological instruction.

ANALOGY OF GELATINO-BROMIDE OF SILVER TO BICHROMATED GELATINE.

Every one is now pretty familiar with the fact that bichromatised gelatine becomes insoluble in warm water when it is exposed to light. It is not our purpose in the present article to treat upon the action of hot water on bichromated gelatine, but to point out other characteristics of the material—more particularly its expansion or "swelling" properties when treated with cold water; also to call attention to the circumstance that the properties of a bichromated gelatine film are largely possessed by a gelatino-bromide one, under certain conditions.

When a gelatine film sensitised with bichromate of potash is exposed to light under a negative, and is afterwards soaked in cold water, the water is absorbed in proportion as the negative has more or less protected it from the light's action. On this property is based photo-lithography, collotype, and other analogous processes. At the same time that the water is absorbed the gelatine swells up. This may be well exemplified by placing an undeveloped print on carbon tissue in cold water for a quarter of an hour or so, and then blotting it off. The image will then be found in strong relief, and with those portions that would have been dissolved away had the picture been developed with hot water in the highest relief, while those upon which the hot water would have the least effect in the lowest. On this principle are based those methods of making photo-mechanical printing matrices known as the swelled gelatine processes.

By the latter processes a much higher relief—or *intaglio*—can be obtained than that resulting from dissolving away the unaltered portions with warm water. We have now before us a porcelain *plaque*, moulded from a cast taken from a swelled gelatine relief, in which some portions are raised fully the twenty-fourth of an inch. Although by this method a very high relief is obtained while the gelatine is moist, a cast taken from it will not be so sharp and crisp as one taken from a washed-out relief, such as those made for the Woodburytype process.

The property of gelatine being modified by the action of light is not confined to its being treated with the bichromates, because analogous effects, both as regards swelling and insolubility, can be obtained, under certain conditions, with gelatino-bromide films, though the fact does not appear to be very generally known.

About a dozen years ago Mr. J. W. Swan devised and patented a method of producing printing plates by taking advantage of the above property. The process is this:—An ordinary gelatino-bromide plate is exposed in the camera, and, if a half-tone typographic block is desired, the exposure is made through lined screens in the usual manner. The image is then developed in the ordinary way with pyrogallic acid. After development the plate is subjected to heat, which causes those portions upon which the light has not acted, or only partially acted, to swell up the same as in the case of a bichromated film. Two methods of applying the heat are described. One is to place the plate in water at about ninety degrees; the other to heat the plate while the film is in a more or less moist condition. In his specification Mr. Swan refers to the effect that the alums, tannin, &c., have on the film in modifying the degree and character of the relief.

From the gelatine relief, obtained as above, the printing plates are made, either by taking a wax or other cast and from that an electrotype, or an electrotype is made direct from the gelatine film. By this method printing blocks can be produced in a very short time. The process has, not until recently, so far as we are aware, been made use of commercially. It may have been, however, without our knowledge, inasmuch as those who produce photo-mechanical plates do not publish the methods they employ.

About ten years back, Mr. Leon Warnerke published, and patented, a process based upon the principle that a gelatino-bromide film, developed with pyrogallic acid, becomes insoluble by the action of light in the same manner as does a bichromated one. Mr. Warnerke spread the emulsion on paper, and, after exposure, the image was brought out with the ordinary pyro developer. The picture was then treated precisely as if it were a piece of exposed carbon tissue. It was squeegeed upon a support—rigid or flexible, temporary or permanent. After resting a short time, the picture was immersed in warm water, and in a few minutes the paper upon which the emulsion was spread could be stripped off, and the gelatine, in proportion as it had not been influenced by light, dissolved away exactly as in the case of carbon printing. By this process a silver picture

is obtained, in which the image is free from gelatine in the deepest shadows, just as it is in the highest lights of a carbon picture.

Pictures by Mr. Warnerke's process can, of course, be intensified by methods not applicable to ordinary gelatine negatives. For example, any of the ways of toning or intensifying carbon lantern slides referred to a short time ago, or the old method of intensifying wet-collodion negatives with acid pyro and silver, will answer. As there is no gelatine in the shadows, it necessarily follows there is nothing to stain.

The analogy in the behaviour of a pyro-developed gelatino-bromide film to a bichromated one has been much overlooked by, if known at all to, modern workers, although it may have many useful applications.

GRADUATED VIGNETTES.

The beauty of a properly graduated vignette is, or should be, that it may be used in contact with the negative, and is not dependent upon a rotary motion or any other expedient for producing or improving its gradation. This being the case it is obviously worth the operator's while to devote especial care to the various mechanical details described in the previous article, more especially as, when a properly graduated *cliché* is once obtained, it may be reproduced photographically with comparatively little trouble.

That is, of course, assuming that the shape is one that is suitable for general use, because it goes without saying that there are shapes which can be adapted only to particular pictures. These, of course, will only be produced as specially required, the "stock" shapes of aperture being those—such as the ellipse or oval, the egg shape or irregular oval, and others assimilating more or less closely to the outline of the head and shoulders—that are found to be of pretty general utility. The shape alluded to refers simply to the aperture in the mask employed in vignetting, because, if the graduation be well performed, it ought to be difficult to recognise any shape at all, so imperceptibly does the shading fall away.

There is one other point to which attention may be drawn, namely, that the density of the vignetting screen should bear a proper relation to that of the negative, in order to produce the best results. For instance, a screen that produces a beautifully soft graduation when used with a strong negative would probably give a harsh and crude result when employed in conjunction with a thin and delicate one, and, conversely, the graduation that suited best a weak negative would be altogether unsuitable under opposite circumstances.

When so much care is required in securing, so far as mechanical means are concerned, evenness and uniformity of gradation, it follows naturally that equal, if not greater, care should be devoted to the preparation of the photographic surfaces concerned. Every one knows how painfully evident minute defects become in the plain background of a portrait or in the sky of a landscape negative, and it may be, therefore, easily conceived that the best vignetting screen will have its beauty and uniformity destroyed by minute faults that might pass unchallenged in an ordinary negative. Whatever the means employed may be, the material should be of the very best.

Perhaps the simplest and easiest process, and certainly the one we should recommend for a commencement of experiments, is the ordinary albumenised printing process. Albumen paper, whether ready sensitised or specially prepared, provides, with a minimum of trouble, a beautifully uniform printing surface, which, if slow in its action, is none the worse for that, since it enables the beginner to carefully watch and study the progress of his work. It is cheap, moreover, and easy of manipulation, and almost the only fault that can be found with the process, as applied to vignetting screens, is the additional length of time required in printing, owing to the want of transparency of the paper. This, however, can be greatly reduced by careful oiling or waxing, and need not form a very serious objection; indeed, many operators would prefer the slow printing, as giving a superior result.

Ready-sensitised paper answers perfectly well for the purpose—that is, of course, presuming it to be of good quality; but we prefer for such uses to sensitise the paper specially, floating the reverse or non-albumenised surface on the silver bath. By this means the image is formed more in the body of the paper, and shows greater density and gradation than when it is confined to the layer of surface albumen. In printing, the floated or non-albumenised surface should receive the exposure. It is purely a matter of taste whether such images are toned or not, so long as care is taken to carry the printing to a sufficiently deep stage to allow for the reduction that will occur where toning is not resorted to. Personally, we have a preference for non-toning.

Albumenised paper being available for the purpose, it might be supposed that gelatino-chloride would be equally so, but such is not the case. Neither the density by transmitted light, nor the uniformity of the layer of sensitive material is satisfactory, so we are reluctantly compelled to reject this material.

Where the opacity of albumenised printing paper is an objection, an admirable substitute is to be found in carbon tissue, and, as this can be obtained sensitised and ready for use, it forms one of the most convenient materials available. Besides this, the quality and character of the image it gives are eminently suited to the reproduction of delicate gradations, and the facilities afforded for the production of images of any grade of density are such as to specially recommend this process. It is true that the inability to watch the progress of the printing forms somewhat of an objection to its use, and the process has also been said to be unsuited to the production of vignettes, owing to the washing away of the finer gradations on development; but, if the latter operation be conducted on a proper surface, there is not the least difficulty in retaining the very finest gradations, and at the same time, if the printing be carried to a sufficient depth, a considerable amount of latitude exists in development, by which the strength of the image may be regulated.

In order to retain the more delicate gradations of the vignette, it is scarcely sufficient to develop on a plain collodion film, however carefully the operation may be performed. A very thin layer of gelatine, rendered insoluble by means of chrome alum, becomes necessary; a strength of five grains of gelatine and a quarter of a grain of chrome alum to each ounce will prove a satisfactory one, and should be applied *after* a collodion film if the vignette is to be stripped from the glass, or directly on to the glass if the latter is to constitute the final support.

Numerous methods of intensification, where such is required, are known to carbon printers, but these are mainly based on the principle of either staining the carbon image or forming a coloured or opaque precipitate within its pores. The bichromated gelatine image, it should be borne in mind, differs from

that of a gelatino-bromide plate in that it is formed of varying thicknesses of gelatine, the very highest lights being represented by clear glass or a total absence of gelatine. Now, it is evident that, if such an image be stained with a transparent pigment, it gains in intensity in proportion to its original gradations; this forms one method of intensification. But two solutions are often applied in succession to form an insoluble deposit in the layer of gelatine, as, for instance, nitrate of silver, followed by pyrogallic acid; but in this case there is no guarantee that the intensification is proportionate to the gradation, or even uniform in its character, since a perfectly opaque deposit may be formed on what ought to be the half-tones. Where, therefore, such methods are adopted, we recommend the staining method, and a very weak solution of potassium permanganate forms a suitable medium.

By either of the methods we have described the vignettes are produced in the form of films, which will be found generally more convenient than glass plates in adapting them to the negative. But other processes are available for the production of vignetting plates or glasses, which may be preferred by some. Simplest amongst these is collodio-chloride emulsion, a description of the method of using which appeared in these pages not long ago. Next to this may be named gelatino-chloride emulsion, both these processes being, like those already described, "slow printers."

Turning to the more rapid methods, which will be found useful, if not absolutely necessary, in many cases where the work has to be performed by artificial light, we have the choice of collodion emulsion and ordinary gelatine plates, the latter, of course, being much the more rapid. The particular methods of working these, so far as the chemical side of the question is concerned, scarcely need any description, the principal difference in procedure lying in the mechanical arrangements for the adjustment of the lighting.

Where film vignettes are required, the collodion emulsion plates will be found the more convenient, as, after development, they only require to be placed on a levelling stand, and a thick layer of plain gelatine poured over the surface and allowed to set. After drying, which will require two or three days, the compound film may be stripped from the glass with the greatest ease.

Of other processes that might be mentioned, there is the almost forgotten method of Mr. Warnerke, in which a gelatine film, on paper, is, after development, and without fixing, squeegeed on to glass, and treated as a carbon print, the undeveloped portions being washed away with hot water. For our present purpose glass plates instead of paper films may be used, the exposure being made *through* the glass; but it should be ascertained beforehand that the film is *soluble*, as the majority of modern plates are rendered more or less insoluble by the use of alum at some stage of their preparation.

Solar Prominences.—In the first number of *Astronomy and Astro-physics* some interesting recent results of photographing solar prominences are given by Professor G. E. Hale. An interesting coincidence is also noted of the same eruption having been photographed and also drawn by hand. It was one that took place on July 9 last year, the photograph being taken at Kenwood Observatory, and the drawing by Herr Fèuyi at Kalosca, Hungary. The general agreement in the form of the prominence is said to be very striking between the work of the hand and the camera.

Ruled Gratings.—Our readers have on previous occasions had brought under their notice the gratings ruled on a concave surface, by means of which Professor Rowlands has been able to secure such marvellous photographs of the spectrum exceeding in size anything before attempted in direct photography. Practical mechanics know the great difficulties attending the construction of gratings of such delicate character as is needed to produce a high-class spectrum. The machines hitherto employed by the Professor enable him to rule lines 50,000 to the inch, but he has just completed the making of a perfect screw which will enable him to make lines of the extraordinary closeness of one million lines to the inch. Lines so fine cannot be seen with the microscope, about 100,000 to the inch being the limit of vision when so aided. The new automatic machine is of marvellous construction, and has many devices to compensate errors; it requires six days' continuous working, day and night, to one grating of the size needed to study the constitution of the solar radiations.

Measurement of Liquids.—The upholders of the "pinch and drop" system of measuring allege, as one advantage of their plan, that time is saved in the operation. Practical men will deny the legitimacy of any such claim, and we should be inclined to side with them. There has lately been described in the *Chemical News* a method for the quick measuring of liquids which, if as advantageous in practice as it appears to be on paper, will sweep away even this excuse. A piece of glass tube is taken, and a cork is inserted at each end. Through the top cork a small hole is bored; this is closed on the under side by a valve of indiarubber cloth, with a piece of cork attached to it. Through the bottom cloth are bored two holes of about equal size, through which are passed two glass tubes, one of which may be curved till the legs are at a right angle. Two clips are attached to two pieces of indiarubber tube at the end of each of these glass tubes. The liquid to be measured is run from a reservoir into the apparatus through the curved tube by opening the clip. The liquid rises and lifts up the piece of cork, thereby closing the valve. There is now the desired quantity of liquid in the apparatus, which can be run out by opening the other clip, the valve meanwhile falling down, ready to let the air escape when filling again. It is obvious that a paper scale might be pasted upon this tube for measuring definite quantities less than the whole tubeful.

Carrier Pigeons and Photography.—Mr. W. B. Tegetmier devotes an article in last week's *Nature* to recommendations in favour of utilising carrier pigeons for carrying messages in times of war, and gives a map or plan of Europe, with the stations for pigeon service, which is there very general, indicated. Should such a service be initiated in this country, it would be to the benefit of photography, as our science is utilised to such an extent as to enable a single pigeon to convey a complete budget of news. During the Franco-Prussian War an immense number of micro-photographs were so made use of.

"The Pigeon Post."—Balloons were continually dispatched from Paris, carrying not only passengers, but bundles of letters, and the homing pigeons belonging to a few private individuals resident in Paris. After a time a distinct pigeon post was organized from Tours, outside the German lines. This pigeon post was recognised by the English authorities, and letters, at the cost of half a franc a word, were sent from Tours into Paris with as great a degree of rapidity as the pigeons could be sent out by balloon and conveyed from the place where they descended to Tours, for the purpose of being reflown into Paris. The letters, which were limited to twenty words, were set up in type, photo-micrographed by the wet-collodion process, the film removed from the glass and enclosed in small quills, which were then attached to one of the tail feathers of the bird. So complete is it stated that this organization was, that one pigeon could have carried into Paris the whole of the many thousand letters that were sent during the siege. There is no special skill required for this kind of work—indeed, any amateur conversant with the wet-collodion process could, with an ordinary camera and lens, reduce a whole page of newspaper to such dimensions as would enable it to be dispatched in the manner described. And not only could printed matter be so reduced, important views and plans could be taken by

an ordinary hand camera, reduced in size, and dispatched within a very brief period of time. There is a limit of definition with an ordinary photographic lens below which it would not be practicable to reduce the size. When the utmost minuteness is required, a microscopic objective is employed to produce the requisite amount of smallness of image combined with perfection in definition.

Animal Photography.—Tuesday's *Globe* has an article devoted to a description of Mr. Gambier Bolton's methods of working, his adventures, and the animal pictures he has obtained in the Zoological Society's Gardens and elsewhere. We gather that Mr. Bolton has secured the honour of Royal patronage, he having recently been commissioned by Her Majesty to photograph a number of inhabitants of the Royal kennels. Lions and tigers, it appears, are good sitters, while the elephant is not. Modern animal photography is conducted under infinitely easier conditions than, say, twenty or thirty years ago, when such men as Mr. Frank Haes did most excellent animal work. And yet the pictures of the present time, to our thinking, exhibit little, if any, advance upon those of Mr. Haes's, a number of which were shown at the Camera Club a few weeks ago.

"Automatic Photography" in Court.—A sitting for the public examination of the officers of the Automatic Photograph (Foreign and Colonial) Company was held before Mr. Registrar Brougham on Tuesday last. But the Earl of Kilmorey, the principal witness, and Captain Charles Wilson, the next important witness, were not present, the first being "detained" at Mentone, the second "failing to attend." The inquiry, which was not completed, elicited some curious and instructive information as to the disposal of the capital that was subscribed, and the amount of it that was not. No doubt the Earl of Kilmorey will be present at the adjourned inquiry, and will enlighten the world as to the details of his connexion with the affair. He is a very old amateur photographer—"instead of which" he became chairman of this ill-fated concern.

"Oil on the Waters" in Photography.—In our correspondence columns Mr. W. Vick, of Ipswich, informs us that having to photograph a house situated on a hill, at the base of which was a pond, the surface of which was covered with ripples, in taking a view looking up to the house, the ripples became a serious matter. Having three ounces of olive oil with him, Mr. Vick threw it upon the water, with the result that there was a subsidence of the ripples, and in the resulting photograph the reflections in the water were discernible, which was not the case before. Mr. Vick sends us a print from which we can confirm the presence of the reflections in the water. He asks if other photographers have tried the plan, and advises the use of more oil than he employed, as well as throwing it upon the water from the side from which the wind is blowing.

"Where Credit is Due."—One ought not, perhaps, to lay too great stress upon after-dinner speeches; but did not Mr. T. Sebastian Davis, in his speech at the dinner on Monday, credit the Society of Great Britain with rather more than its share when he attributed the introduction, or first publication, of almost all the important advances in photography to this Society? At one time this might have been said; but for a long term of years other channels than that of the Society have been selected through which to convey first intimation of discoveries, or even improvements. Many instances might be adduced in which the Society's aid was not evoked for their promulgation, such as the collodio-bromide and gelatino-bromide processes, or any of their cognates. The current processes of the period, such as platinum, kallitype, and bromide printing, or even the toning of bromide prints, have not reached the public through the medium of the Society: the valuable researches of Hurter & Driffield were ushered in through another channel; nay, even a feature of advance, cited as an instance by Mr. Davis—Chas. Bennett's discovery of a means by which the acme of sensitiveness was imparted to gelatine plates—was not given to or through this Society, but another, now non-existent, the original South London Society. Innumerable other instances could be adduced, such as orthochromatic photography, Waterhouse's reversal by thio-carbamides. While saying this, however, we fully recognise the great value of the contributions to the Society by such men as Captain Abney, T. R. Dallmeyer, and others.

GRINDING THE EDGES OF PLATES.

I.

Nothing adds more to the comfort of handling glass plates, either in development or in the form of finished negatives, than the removal of the sharp edges left in cutting; but very little, if any, attention is given to this point by plate makers or consumers. In former days, when the preparation of dry plates was conducted almost entirely by the user himself, grinding the edges of the glass before use formed one of the duties of the careful operator, and, though not absolutely essential, was very commonly resorted to in consequence of the comfort it added to the after-operations. Roughing the edges, too, was looked upon as a useful aid to preventing the collodion film slipping, and I remember buying as a regular commercial article many years ago a lot of plates that had not only had the sharp edges and inequalities of cutting removed, but which were also neatly surface-ground to the depth of an eighth of an inch on each side. I mention this to show the care that was devoted to little matters in those days.

It is, perhaps, too much to ask at the present day, and at present turn-out prices, that plate-makers should grind the edges of their glass before coating it with emulsion; but I am, perhaps, not alone in thinking that they might often do a great deal more than is done in that direction without over-burdening themselves with trouble, or getting their customers into too luxurious habits. The dark room, of all places, is the last to be chosen for the purpose of handling badly cut glass plates; yet who has not had to complain of lacerated fingers, and even blood-stained films, due to hurriedly changing a packet of plates that would make a glazier's apprentice in his first year blush?

The trouble is not so rife with the larger sizes, because, for one reason, these are actually cut before coating, and by competent workmen; but when we come to the smaller sizes, which are too often cut down after coating, the evil reaches its full height. In such cases everything is against the production of clean edges. The work is done by *feel* rather than by *sight*, and the heavy pressure necessary to penetrate the gelatine film is far from conducive to clean cutting, especially when the operator never served an apprenticeship to the use of the diamond, but simply "picked it up" as one of the adjuncts of plate-making. Under such circumstances, the wonder is not perhaps so much that plates are not better cut, but that they are cut as well as they are.

But, if we dare, not look for any considerable reform on the part of the manufacturer, it is at least possible to study our own personal comfort in using commercial plates, more especially as these run so generally now in the small sizes. The vision of erecting a grindstone as an addition to the furniture of the dark room is scarcely an engaging one from any point of view, and readers will perhaps scout the idea of interfering with matters as they are on that account alone. But a grindstone is by no means a necessity, at any rate in the form usually understood by that term, and represented by a heavy revolving disc of material requiring an extra hand to turn it. The preliminary steps, at least, to comfort may be taken in the dark room with very simple appliances.

Even in broad daylight a circular revolving stone is perhaps the very worst tool an inexperienced hand could apply to the purpose, as the principal end attained, failing the necessary experience, would be the opposite of that desired. A better result would be gained by turning the stone on its side, and using it as a grinding slab, though the comparative softness of the material scarcely fits it for the purpose. A piece of fine, hard flag-stone, worked to a smooth surface by a stonemason, would answer admirably, either in or out the dark room, though it forms a rather cumbersome piece of apparatus to move about when necessary.

I have for many years employed for the purpose an emery slab, which is at once harder and finer, and, if properly made, cuts as freely and keenly as the roughest grindstone. I at one time employed a square scythe "rubbing stone;" but this, while serving the purpose

fairly well, is too soft, gives off a lot of dust and grit, and is constantly requiring surfacing. The emery slab, on the other hand, costs little, gives the minimum of trouble as regards dust, and is sufficiently hard to last a long time without having its surface renewed.

In speaking of an emery slab, I do not, of course, mean a solid slab of pure emery or corundum, or even of the mixture of which small emery wheels are made; such a slab, if of sufficient size to be of practical use, would be a somewhat costly affair, whereas my substitute, while equally efficient, need cost but a few pence. It consists of wood faced with emery, but upon the method of "facing" depends entirely the character and value of the tool. I have tried a variety of plans, simplest and most primitive of which consisted in glueing a sheet of emery cloth on to a plane board, and this answered very well while it lasted, which, however, was not long. Then I was led to try a mixture of emery and shellac melted together, which was intended to be spread upon a flat surface; but I never properly succeeded in getting it out of the pipkin in which it was mixed. Next I tried a mixture of emery and Stourbridge clay made into a paste; but, as this had to be dried and *baked*, it was not only troublesome, but the wood would not stand the operation, and without that support it was no use.

After trying powdered emery dusted over a coating of shellac varnish, as used by jewellers and dentists, I had the "tip" given me by a working cutler to try *glue*, and this, the simplest and easiest, proved by far the best of all; indeed, it is surprising what a hard, durable, and, at the same time, free-cutting surface it gives. I have for five or six years used for all grinding purposes, for lathe and other tools, discs of wood faced in this manner with powdered emery, and find them superior to the ordinary emery wheels at one-twentieth the cost.

W. B Bolton.

(To be continued.)

CONTINENTAL NOTES AND NEWS.

Jena Non-actinic Glass.—A new glass for laboratory purposes that will pass none but the red rays of the spectrum is said to be in course of preparation at the Jena Glass Works.

Lantern Exhibitions in Vienna.—Apparently the Viennese public take very kindly to lantern displays, over three thousand persons having, on one night, attended an exhibition organized by the Amateur Club of Vienna. Two hundred and fifty slides were shown, of which a portrait of the Emperor, His Majesty's study, the statue of Marshal Radetsky, and studies of Viennese life were the most popular.

Ceramic Paper Process.—In Guerot's vitrifying process, according to M. Pector, the photo-ceramic paper is sensitised with a solution consisting of bichromate of potash added to some unrevealed substance, and a print with a safe edge taken from a negative in the usual way. The picture is washed, is squeegeed in contact with the vitrifiable *plaque*, and the paper stripped. The image is then treated with a weak solution of permanganate of potash, is washed and dried, and finally fired.

Portrait of Stas.—The *Bulletin* of the Association Belge de Photographie, of which he was a member, gives a phototype portrait of Stas, the eminent Belgian chemist, whose death we recently announced. He was engaged for six years in studying the properties of bromide and chloride of silver. Some of his experiments were of such a delicate nature that he frequently had to sit up all night and watch the substance upon which he was working. It was from him that the late Dr. Van Monckhoven took many of his ideas in emulsion-making.

English Photographic Societies.—Dr. Phipson, the London correspondent of the *Moniteur*, informs the French public that there are now 114 photographic societies in this country. He says that the names, addresses, and objects of all these different societies are given alphabetically in—no, *not* in The British Journal Photographic Almanac for 1892; for, if he had drawn his statistics from *that* volume, he would have avoided the serious error into which he has fallen. There are now nearly 250 photographic societies in this country, Dr. Phipson.

Transferring Albumen Prints to Wood, Metal, Glass, or Porcelain.—If the surface is polished, says a contemporary, it should be well dried. A thin substratum of copal varnish is then applied to it, and the albumen print, toned and fixed, but still wet, is placed in contact with the varnished support, and well squeegeed down, print side to the varnish, of course. It is allowed to dry for about four hours, and then the back of the paper is moistened with a damp sponge, when it can be peeled off, the albumen image adhering to the varnish. This should then receive a protecting coat of varnish.

The "Association Belge."—Perhaps the Photographic Society of Great Britain might take a hint from the constitution of the large and flourishing Belgian Society we have named. Its headquarters are at Brussels, but sections are also established at Antwerp, Ghent, and Liège. Each section enjoys autonomy of administration, and the proceedings of all four are periodically published in the *Bulletin*. The central *Comité d'Administration* consists of members drawn from the various sections, and thus ranks, as it were, as a kind of grand council, to which the various sectional Committees are affiliated. May we hope one day to see sections or branches of the Photographic Society of Great Britain established in Liverpool, Manchester, Birmingham, and other large centres.

Idoine.—This is the name of a new toning agent, said to be suitable alike for prints in aristotype and albumen papers. It is in the form of a powder, and the proportions of a suitable bath are given as follows:—

Idoine powder	10 grammes.
Hypo	129 „
Water (filtered or, better, distilled)	1 litre.

The solution is ready for use at once, and the print is placed, without washing, in a quantity of it, sufficient to cover them. The tone of the image is at first sepia, and it then passes through various stages. When the desired tone is reached, the print is withdrawn and washed in several changes of water; slightly over-printed pictures are recommended for obtaining good tones.

RATIO OF GRADATION.

As Mr. Michael's letter, in your issue of the 5th inst., shows evidence of an imperfect acquaintance with our investigations, we shall be glad if you will kindly allow us to make the following reply; and, as we at once looked up the particular modification in development to which Mr. Michael refers, and put it to the test in our usual way, we thought the result might be of interest to your readers.

Mr. Michael is, apparently, under the impression that we hold that the ratio of gradation is unalterable, not only by modifications in the constituent parts of a developer, but that it is invariably the same whatever the developing agent employed. The former we do hold, the latter we do not. In our original paper we distinctly say: "There is a theoretical possibility that a plate may be rapid to one developer and slow to another, so as to require different exposures, according to the developer used."

Mr. Michael will also find from this paper that the primary object of our investigations was not to determine the precise function of development; this was a purely incidental, though necessary, inquiry in our search for a method of determining the relative speeds of plates. It is obvious that, before we could study the action of light upon the sensitive plate, it was necessary to ascertain whether modifications in the developer, within, at any rate, wide limits, affected our results, in order to be quite sure that these were due to the action of the light alone.

Another erroneous impression under which Mr. Michael labours is, that we have used the sensitometer in our investigations. This is not the case, as we do not attach any value to this instrument for experimental purposes. Our method of working is to submit the plates under investigation to the direct action of a standard light, and then

to ascertain, by means of our photometer, the relative amounts of metallic silver produced after development.

We also consider this method of experimenting far more likely to lead to the truth, and far more scientific than that of taking landscapes in the camera in the ordinary way. By our method the results can be measured, converted into numbers, and, as such, compared. The unaided eye will detect a difference, but is quite incapable of deciding what the difference amounts to. It is this method of quantitative determination which has been so long wanted in photography in order to decide matters which have hitherto been merely opinions.

As an example of the alteration of the ratio of gradation in development, Mr. Michael refers to a method of developing plates which have been exposed on subjects having great contrasts, which was propounded by Captain Abney in the *Year-book of Photography for* 1889. As we have said, we at once made an experiment to ascertain whether this method of development would produce any abnormal result. Our method of procedure was as follows:—We submitted a sensitive plate to the direct action of a standard candle at a distance of one metre, the seven exposures given varying from ten seconds to 640 seconds. After exposure, the plate was cut into two parts, which we will call A and B, each bearing the seven different light impressions. A was developed in exact accordance with Captain Abney's instructions, and B in an ordinary normal developer.

Development of A (Stock Solutions).

No. 1.

Ammonia	1 part.
Water	9 parts.

No. 2.

Potassium bromide	20 grains.
Water	1 ounce.

(*a*.) Soaked plate for one minute in—

No. 1	20 minims.
No. 2	40 ,,
Water	2 ounces.

(*b*.) Added one-thirtieth of a grain of dry pyro, and allowed to act for eight minutes.

(*c*.) Added another one-thirtieth of a grain of pyro, and again left to act for eight minutes.

(*d*.) Added one-third of a grain of pyro, and 20 minims of No 2. This was also allowed to act for eight minutes, after which the plate was well washed.

(*e*.) Applied new developer made up as follows:—

No. 1	40 minims.
No. 2	120 ,,
Pyro	1½ grains.
Water	2 ounces.

In about four minutes the required density was reached, and development stopped.

Development of B.

Ammonium bromide	1 grain.
Ammonia	2½ grains.
Pyro	1½ grain.
Water	1 ounce.

Development was complete in about six minutes.

The following are the results obtained upon measuring the densities of A and B, from a comparison of the ratios of which it will be seen that, even with such extremely different methods of development, the density ratios are practically unaltered.

Exposure.	A.		B.	
CMS.	Density.	Ratio.	Density.	Ratio.
10	·215	1·00	·240	1·00
20	·430	2·00	·445	1·85
40	·740	3·44	·810	3·37
80	1·190	5·53	1·300	5·41
160	1·580	7·34	1·760	7·33
320	1·890	8·79	2·215	9·22
640	2·195	10·20	2·560	10·66

Should Mr. Michael be disposed to think that the range of gradation we have taken is insufficient to decide the question, we may say that the total range of gradation which the plates we used was capable of rendering truly lies in between exposures of 40 and 320 candle-metre seconds. Beyond these exposures, the gradations fall into the period of under-exposure at one end, and into the period of over-exposure at the other end of this scale.

We are glad to have had our attention called to such a striking departure from ordinary methods of development, and to have had the opportunity of showing that even this does not, in any way, conflict with results we have before obtained.

F. Hurter & V. C. Driffield.

REFLECTIONS COMBINED WITH REFRACTIONS.

[A Communication to the Photographic Society of Great Britain.]

A year or so ago I contributed a paper to this Society on the subject of the effect of re-reflected images from the plate itself, and the effect on the final brilliancy of the image. On that occasion I showed how a bright portion of the image might be re-reflected from the surfaces of the lens itself, forming a secondary real image upon the plate; the lens itself in such cases acts as an image-forming combination corresponding to a reflecting telescope. There is, as I pointed out, a much greater likelihood of a detrimental interference upon the resulting brilliancy of the image, the greater be the number of surfaces, concave towards the plate. In the Petzval portrait lens, for example, there are two concave surfaces so disposed in the front combination, and three surfaces so disposed in the back combination. In the portrait lens introduced by my late father there are only two concave surfaces thus disposed, viz., in the front; again, in double cemented combinations of the rapid rectilinear type, there are the two concave surfaces towards the plate in the front combination only. In the single meniscus there are no concave surfaces towards the plate, and hence it is that there is no possibility of the formation of an image by re-reflection, from the plate back on to the plate.

Another point of interest that has a bearing on this subject is, attention to the diameter of concave surfaces that are thus exposed towards the plate. It was in the construction of the rectilinear landscape lens that I introduced in 1888 that my attention was first called to the importance of the defects that concave surfaces towards the plate might have in lens construction; the exterior element forming the corrector has a concave surface towards the plate, and for extreme brilliancy in the resulting image does not compare favourably with the cemented meniscus, and, in cases of great contrast, the appearance of what I term "ghost," as distinguished from "flare-spot," was very remarkable. By reversing the lens entirely in its place the ghost was no longer visible, the stop then being behind the lens and a different concave surface facing the plate. The effect of reflected light in employing this lens under ordinary circumstances seemed to have an agreeable tendency in slightly softening the image, which has been approved of by several of our leading photographers; but that is a matter outside the subject, and one of opinion.

In the drawings and calculations I made at that time, to prove that real reflected images were thus formed, I conceived the idea that concave meniscus lenses, or even convex lenses, with the posterior surfaces concave towards the incident rays, might be made use of for the formation of real images of considerable brilliancy by having the posterior surfaces silvered. First, speaking of single lenses, it can be easily demonstrated that it is possible to destroy spherical aberration; it is evident that the effect of a pencil of rays entering a lens and being reflected at the second surface, and passing out again, is equivalent to combining the well-known equations:—

(1) For the first refraction;
(2) For reflection;
(3) For the second refraction.

Put as a first approximation—

$$\frac{1}{f} = 2(\mu - 1)\left(\frac{1}{r} + \frac{1}{s}\right) + \frac{2}{s},$$

which shows that the effect on the pencil is that of two passages through the lens and a reflection at the second surface. This equation presumes that both surfaces are convex; if the first be concave, the resulting equation is represented by

$$\frac{1}{f} = 2\left\{\frac{\mu}{s} - \frac{\mu - 1}{r}\right\};$$

thus, to make the focal length positive, the first term in the bracket must be greater than the second, or the second surface s must be less than $\left(\frac{\mu}{\mu - 1}\right)r$.

For ordinary glass, it appears that a real image can be formed pro-

vided the radius of the second surface be less than three times that of the first.

Without troubling you with the details of the well-known formulæ for combining the refractions and reflections referred to in the second approximation, it can be shown that for ordinary glass the aberration is expressed by

$$\frac{1}{9}\left\{\frac{r^3}{1}+\left(\frac{r}{1}+\frac{5}{2f}\right)\left(\frac{1}{r}+\frac{1}{f}\right)^2\right\}+\frac{1}{s}\left(\frac{1}{s}+\frac{1}{3r}\right)^2=0.$$

It is evident that if r and s are both positive, or the lenses convexo-convex, the aberration cannot be destroyed, but if we assume the reciprocal of the first surface to be equal to $= -\frac{n}{s}$, the expression, by substitution in the equation above, will then be found possible to be solved; it becomes a cubic equation, and shows that the aberration may be entirely cured for parallel rays by making the first surface negative and a very little less than the second.

The drawback to such a mirror is the interference that will exist from the faint image formed by reflection from the first glass surface, and will therefore be useless for the formation of photographic images.

This subject has occupied the attention of Sir George Airy, who proposed to silver one side of each of two glass lenses to give the resulting reflector a Gregorian or Cassagranian form; the large mirror is a meniscus or double convex silvered at the back; for the Gregorian a small speculum is concave-convex. To correct the dispersion, leaving, of course, no secondary spectrum, one is positive and the other negative, their powers being inversely as the squares of their distances from the first image between the mirrors.

I have never seen such an instrument, and should be glad for information from any of the members, should they have come across such a construction, to know something of the performance of the instrument, as well as the angular aperture that has been attained. I have constructed one myself, of the concave meniscus form, in which the first surface is much deeper than the second, so that that interference from the faint reflection from it is not noticeable, and does not produce a detrimental effect; the aberration of the first reflecting lens being corrected by a negative lens, both surfaces of which are convex towards this mirror, the second one silvered again, and have thus produced a ratio of aperture to focus of one-half. The work in this respect is not quite completed, but I hope to exhibit it shortly at a technical meeting, when this, and other forms that I am preparing, may be of interest to you.

With regard to the other forms I refer to, I anticipate, from the calculations I have made, that important improvements may be obtained by silvering one side of compound lenses. A simple and interesting application of combining reflection and refraction can be illustrated in a novel form of view finder. I place a convex lens in a tube moderately near to a plain mirror (or it may be convex or concave), and by this means make one lens perform the work of two, and, by a proper selection of focus for the lens and its distance from the mirror, one can adjust its equivalent focal length to be exactly that of the camera lens employed; by making this lens of considerable diameter, and mounting it on the slide-carrier, and having a small screen above, and in the principal plane passing through the optical centre of the lens, adjustments as regards focus can be readily made in most cases of lighting; of course it would be difficult with a very strong light shining on the screen, which, however, may be mounted in a short tube.

Another application, in which I think there may be a considerable future, is the construction of large concave mirrors, silvered at the back, for lantern condensers, when employing the electric light, where too close a proximity to ordinary condensers would be accompanied by great danger of cracking, &c. By such a form of condenser a very large angle can be included, and with properly calculated surfaces to the mirror, and, perhaps, the addition, in front of the slide, of the corrector, may enable better results than have hitherto existed to be obtained. I am at present engaged on two such constructions; one to obtain the best possible result from the silver concave mirror, and the other by an additional lens in front of the lantern slide. The main drawback that suggests itself to its use is the difficulty that may arise from the shadow of the poles; it is possible that this may be overcome by revolving them. I do not think that another drawback that suggests itself, viz., the slight amount of light that reaches the slide from the naked light, will be of much importance, and that the naked light will, of course, be further away from the slide than it is from the mirror.

Another application that has struck me as useful for such class of reflecting mirrors, on account of the large angular aperture attainable, is in regard to use in naval work for scanning the horizon in dull weather; if such a mirror, a foot or more in diameter, were mounted in some manner, such as a ball and socket mounting from its centre, carrying an eyepiece on an arm, a rapid and powerful search might thus be made of the horizon.

T. R. Dallmeyer.

THE PHOTOGRAPHIC SOCIETY'S LECTURES.—III.

PHOTOGRAPHY AS A BRANCH OF TECHNOLOGY.*

A Branch of Technology of the First Order.

To all who are interested in the advancement of art and of science, photography appeals, therefore, as a branch of technology of the first order of importance; in saying that it appeals to art and to science for such recognition, it is evident that it appeals to the nation at large. Even to the "pure scientist," who is supposed to lose interest in a discovery as soon as it becomes practical, *i.e.*, commercial, this subject appeals for support, for, from the study of the photographic processes themselves, many important contributions to physics and chemistry have been made, and still greater results may be expected to follow from the investigations of scientific men in this direction. From its purely practical side, the claim of photography to be considered as a branch of technology will receive additional support when it is remembered how many distinct branches of manufacture it draws upon, or has, indeed, actually called into existence. Consider how it is dependent on the optician for the manufacture of lenses; consider, again, the special branch of cabinet-making and joinery which it has created in order to supply cameras and other instruments; remember, also, the boon which photography has conferred upon the chemical manufacturer by the demand for fine chemicals which it has created. Neither must it be forgotten that a new, and by no means unimportant, development in the manufacture of paper, gelatine, and albumen has arisen through the introduction of photography.

From every point of view, therefore, photography claims to be placed on the same basis as other branches of technology. The Photographic Society, I am happy to see, fully recognises this in the recent action which it has taken, and which is expressed in the report of the Affiliation Committee. I consider this an excellent move in the right direction. But it is easy enough for the Society to recognise the technical importance of its own subject; the difficulty is to move public opinion, and to convince the nation that we are behind other countries in this respect. The first step is to draw up, and circulate widely, an account of what is being done for photographic technical instruction on the Continent. I had intended, when first invited to lecture here, to offer some such statement, but I was glad to read, in a recent number of your *Journal*, that this task had been undertaken by Mr. Warnerke, and I hope that some means will be taken to bring his report under the notice of those interested in technical education. It is clear, from what has already been attempted by this Society, and from the opinions which have been expressed on all sides by those whose voices carry the weight of authority, that nothing short of a Photographic Institute will meet the requirements of the case. This, I most earnestly hope, will be the end and aim of every movement made by the Society. In the Cantor Lectures, which I had the honour of delivering before the Society of Arts in the spring of last year, I alluded to the absence of such an establishment in this country as "remarkable;" before this Society I am tempted to express myself more strongly, and to stigmatise its absence as a national disgrace.

A Photographic Institute.

Of course we all have more or less distinct ideas of what the functions of such an Institute would be. It is premature as yet to speak of the details of an institution which exists only in our aspirations. But, whatever may be the final outcome of the movement which has been started, the whole duty of such an institution might be summarised in the statement that its work would consist in spreading a knowledge of all that is known concerning photography, and in investigating that which is unknown. In other words, its duties would be, as in the case of kindred institutions, teaching and investigating. Without wishing in any way to intrude my opinions into the deliberations of your Council, I thought that I might with advantage avail myself of the present opportunity of submitting my own views with respect to this question of technical education in photography. In giving expression to these views I have in mind the consideration that the remarks which I may apply to our special subject apply to many other related technical subjects, and that the course which may be adopted in the starting of such an institute as that which we all wish to see come into existence may have a wide and important influence on existing notions concerning the whole question of technical education.

* Continued from page 89.

In the first place, then, let me express the hope that any action taken by this Society, in the direction of photographic technology, will be of the highest possible character. This may appear to you quite an unnecessary caution, but in involves a question of principle which it is very important to ventilate. After many years of apathy in this country, and after experiencing the inevitable consequence that we were being beaten in many branches of applied science by our Continental competitors, we underwent a few years ago a kind of revival in technical education. One outcome of this agitation was the foundation by the City and Guilds of London of that Institute in whose service I have had the honour of being employed. It is not for me to dwell upon the results which have flowed from the inauguration of that Institution, but it is no exaggeration to say that the wave of public opinion which raised it into existence is still surging throughout the country. The last decade has witnessed the rapid multiplication of technical classes and colleges, the foundation of technical associations, the growth of polytechnics, and, last of all, the diversion by the Government of the funds derived from the beer and spirit duty in the direction of technical education. The result of all this is that the means of technical education are being spread broadcast throughout the land.

Now it is one of our national characteristics that when we once wake up to the circumstance that we are behind other countries in any matter affecting our industries, or, I might say, when we have this unpleasant truth brought home to us by the superior workmanship or lower prices of our competitors—we are apt to seek remedial measures to recover our lost ground by what might be called indiscriminate and impulsive rushes. I am afraid that the technical education movement has, to some extent, been of this impulsive character. I am not going to be rash enough here to attempt to lay down any precise definition of what is meant by technical education; but a few months ago, the Duke of Devonshire, then Lord Hartington, made a speech at the opening of the Storey Institute, at Lancaster, in the course of which he said that technical education was not the teaching of any particular trade or handicraft, but rather of the scientific principles underlying the trade or handicraft. I think this fairly represents the opinions of those who have considered the subject, and I hope that this definition will be borne in mind in any movement which this Society may inaugurate. Are we adopting the best methods of technical education?

If now we review the situation, it will appear that the general spread of this educational movement may be taken as an indication that we intend to give battle to our competitors, and that we look to technical education to enable us to carry on the industrial campaign. So far so good; but our competitors, be it remembered, have been actively carrying on this branch of education during our long years of apathy. We have taken up our weapons rather tardily, and, as I just said, somewhat impulsively, and if we hope for success it behoves us to examine these weapons critically, in order to make sure that we are fighting on equal terms. In other words, are we adopting the best methods of technical education? This is the question which should be put in the foremost place before any measures can be taken by this Society in the much-needed direction of photographic technology.

So far as concerns those technical subjects in which, as in photography, chemistry is largely, if not entirely, the underlying science, I am bound to confess that the impulsive character of the technical education movement to which I have referred may, if not properly directed, run us altogether off the right track. One of the greatest functions of this Society would be to prevent such a calamity by diverting the tide of public opinion into the proper channel for its own particular subject of photography. The ideal technologist is the man who possesses a good general knowledge of the principles of those sciences underlying his industry, together with an expert special knowledge of his own subject. The first step in the training of a technologist is, therefore, to lay the broad foundation of general principles, and then to erect upon this foundation the superstructure of special knowledge. You must understand that I am attempting only to define an ideal technical training, having more especial reference to those subjects connected with, or based upon, chemical science. In the present state of affairs it cannot be denied that there are large classes to whom this method cannot be applied; there are specialists in every industry who know little or nothing of the scientific principles underlying their occupation, and in such cases the method may have to be reversed, and the instruction may have to proceed from unscientific specialism to scientific generalisation. But this method is, in my belief, only a makeshift which it may be expedient to adopt to meet existing conditions—it is not technical education in the strict sense of the word education, but the tinkering up of a system which has been bad from the beginning. It is only when we can deal with the student just starting on his career as a technologist that the true method can be applied; as things are, we have many years of tinkering work before us, and it is to the rising generation of younger technologists that the future industrial welfare of the country is committed.

(To be continued.)

Our Editorial Table.

A Flash Lamp.

By A. H. Baird, 15, Lothian-street, Edinburgh.

This lamp, designated the "Todd-Forret Magnesium Lamp," is intended for either instantaneous or continuous exposures. There is a reservoir for the powder, from which a jet is propelled up through

the centre of a large spirit flame. The cut shows its construction. It is well made, and sells at a low price, 12*s.* 6*d.*

Guide Pratique pour l'Emploi des Surfaces Orthochromatiques.

Par L. Mathet. Paris: Société Générale d'Éditions, Boulevard Saint-Germain, 24.

In this small work of some eighty-five pages the author deals with his subject in a manner which, to the practical photographer who desires to sensitise his own plates, will be found quite fulfilling the promise implied in the title—that is, of being a guide to orthochromatic photography. After instituting comparisons between ordinary and orthochromatic plates, and detailing the special precautions necessary in the preparation and employment of the latter, the author treats successively of coloured screens, colouring matters, and the sensitising of the plates, for which a number of formulæ are given. Of these we select one, which is said to sensitise for the yellow, red, and orange rays:—

Alcoholic solution of quinoline, 1 : 500	8 c.c.
Alcoholic solution of cyanine, purified by alcohol, 1 : 500	1 ,,
Ammonia, ·880	2 ,,
Water	200

The ammonia to be added last. Plates are left in this solution for from sixty to eighty seconds, and keep for about twenty days.

It is on the whole an excellent *brochure* on orthochromatic photography.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 1997.—"Improvements in Panoramic Cameras." R. W. Stewart.—*Dated February* 1, 1892.

No. 1994.—"Improvements in Instantaneous Shutters for Photographic Purposes." W. Tylar.—*Dated February* 1, 1892.

No. 1998.—"Employment of Aromatic Amido-compounds as Developing Means in Photography." J. Hauff.—*Dated February* 1, 1892.

No. 2067.—"Improvements in Photographic Cameras." Complete specification. J. T. Chapman.—*Dated February* 3, 1892.

No. 2076.—"Improvements in Stands for Holding Photographs, Drawings, and other similar Articles." F. R. Walton.—*Dated February* 3, 1892.

No. 2145.—"An Improved Method of Making Photographs by Artificial Light." S. H. Fay.—*Dated February* 4, 1892.

No. 2235.—"Improvements in Photographic Apparatus." A. Dubosco.—*Dated February* 6, 1892.

PATENTS COMPLETED.

Improvements in or Appertaining to Photographic Cameras.

No. 3823. Thomas Edward Corney Wilson, 28, Rufford-road, Fairfield, Lancashire.—*January* 16, 1892.

In detective cameras at the present time, where the plates fall out of the field of view, the camera has to be nearly double the depth that would otherwise be necessary in order to supply the box into which the plates fall; and where the plates fall vertically, exactly double the depth is required. Now, my invention is designed to enable the plates to fall vertically, and yet only to require very little additional depth. I place all the plates immediately behind the frame or obstruction, which regulates the distance from the object lens, so that as each in succession comes against this frame, they are in the field, and are ready for a photograph being taken. Behind the plates I place a dummy plate, pressed against them by a spring, and attached to this dummy plate a string, passing through the camera back. At the bottom of the camera proper I arrange the slide, which, being drawn back, leaves a hiatus immediately below the plates just wide enough for one plate to fall through; the plate cannot, however, fall, if pressed tight against the frame by means of the spring. Immediately under the body of the camera I hinge a box; this box is ordinarily held tight up against the camera bottom. Light is prevented from passing through the slot in the bottom, which is just clear of this box, by a curtain of black cloth, which is fastened to the camera bottom beyond the slot and to the box. The catch being withdrawn, this second box hangs vertically, and in this case a slit in this box comes immediately below the slit in the camera. Consequently, the slide having already been withdrawn whenever the string is pulled, the nearest plate falls at once into this box. The box then being pressed back into its original position, the plate falls to the bottom of the box; namely, to the side of the box when vertical farthest away from the slit. The result is that, if the box and the plate-holding box each hold a set of twenty plates, each of these twenty plates in succession can be exposed, and allowed to fall into the receiving box.

Improvements in or Relating to Magnesium Flash Lights.

(A Communication from Friedrich Hermann Felix Engel, 21, Graskeller, Hamburg, Germany.)

No. 7487. Reginald Haddan, 18, Buckingham-street, Strand, W.C., London.—*January* 16, 1892.

This invention relates to lamps and apparatus connected therewith whereby a flashlight may be produced by blowing powdered magnesium into or through the flame of the lamp. The object of the improvements is to provide a simple apparatus or means by which the necessary quantity of magnesium powder may be transferred from a reservoir thereof to the apparatus, by which it is to be blown into or through the flame so that the lamp may be safely and quickly recharged for another flashlight.

What is claimed is:—1. The combination with a blowing tube having recessed cavities for receiving a charge of powder to be blown, of a movable reservoir adapted to be moved over said cavities for filling the same by gravity, and thereafter to be moved from over said cavities whereby the latter are left charged. 2. The combination with a blowing tube having recessed cavities for receiving a charge of powder to be blown, of a movable reservoir adapted to be revolved on the said tube so that it may be moved into an upward position for filling the said cavities, and thereafter moved below the tube substantially as set forth, whereby the cavities are left charged.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
February 15.....	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 15.....	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
,, 15.....	Hastings and St. Leonards	
,, 15.....	Leeds (Technical)	Mechanics' Institute, Leeds.
,, 15.....	South London	Hanover Hall, Hanover-park, S.E.
,, 16.....	Exeter	College Hall, South-street, Exeter.
,, 16.....	Keighley and District	Mechanics' Institute, North-street.
,, 16.....	North London	Wellington Hall, Islington, N.
,, 16.....	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 16.....	Southport	Shaftesbury-buildings, Easthank-st.
,, 17.....	Brechin	14, St. Mary-street, Brechin.
,, 17.....	Bury	Temperance Hall, Bury.
,, 17.....	Hyde	
,, 17.....	Manchester Camera Club	Victoria Hotel, Manchester.
,, 17.....	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 17.....	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 17.....	Southsea	
,, 17.....	West Surrey	St. Mark's Schools, Battersea-rise.
,, 18.....	Birmingham	Lecture Room, Midland Institute.
,, 18.....	Camera Club	Charing-cross-road, W.C.
,, 18.....	Greenock	Museum Com. Room, Kelly-street.
,, 18.....	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 18.....	Oldham	The Lyceum, Union-st., Oldham.
,, 19.....	Cardiff	
,, 19.....	Holborn	
,, 19.....	Leamington	Trinity Church Room, Morton-st.
,, 19.....	Maidstone	"The Palace," Maidstone.
,, 19.....	Richmond	Greyhound Hotel, Richmond.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

February 9.—Anniversary meeting.—The President (Mr. James Glaisher, F.R.S.) in the chair.

Messrs. H. Snowden Ward and J. W. Marchant were elected members of the Society.

It was announced that the Dundee and East of Scotland Photographic Association and the Leeds Photographic Society had been affiliated to the Society.

The Hon. Secretary stated that the Council had appointed Messrs. John Spiller, William Bedford, T. Sebastian Davis, and H. C. Jones as a Committee to deal with the question of the new methylated spirits.

The following is an extract from the report of the Council:—

During the year 1891-2 the following papers were read at the ordinary meetings:—*Standard Registering Slides and their Mode of Use*, by Sir David Salomons, Bart.; *Platinotype*, by W. Willis; *Photographic Methods of Obtaining Polychromatic Impressions*, by L. Vidal; *On an Undiscussed Point in the Illumination of the Dark Room*, by W. de W. Abney, C.B., R.E., F.R.S.; *Photographic Technical Instruction on the Continent of Europe*, by L. Warnerke; *Photo-micrography*, by A. Pringle; *Reflections combined with Refractions*, by T. R. Dallmeyer.

Special attention has been paid to the Technical Meetings by a Committee appointed for that purpose. Subjects chosen for discussion have been announced beforehand, and arrangements made for the exhibition of apparatus and specimens of work likely to prove interesting.

Among the various subjects selected may be specially mentioned *The Influence of Development on Gradation*. Dr. F. Hurter attended, by invitation, the meeting at which this question was considered. At another meeting Colonel Waterhouse read a paper on *Electro-chemical Reversals with Thio-carbamides*, giving the results of a number of experiments tried by him in the Society's laboratory.

Advantage was taken of Mr. Leon Vidal's paper on *Polychromatic Impressions* to organize an exhibition of chromo work, in which photography plays an essential part. A large number of exhibits were received, and about 280 visitors came to examine the exhibition.

In accordance with the announcement made at the last anniversary meeting, Mr. Leon Warnerke was good enough, on March 4, to deliver a lecture, with practical demonstrations, on *A Simplified Photo-collographic Process* to a crowded audience. It was desirable that this should be the beginning of a series of such lectures, but it was then too late to arrange for others to be delivered during that session.

During the present session the under-named gentlemen have favoured the Society by the delivery of similar lectures:—Mr. T. Bolas, F.I.C., F.C.S., on *The Relations of Photography to the Industrial Arts*; Mr. Chapman Jones, F.I.C., F.C.S., on *Distortion of Outline in Photography*; Professor R. Meldola, F.R.S., on *Photography as a Branch of Technology*.

Efforts will be made to provide courses of similar lectures from time to time. It is anticipated that these lectures will materially assist in the promotion of photographic technical education, and thus help to carry out one of the objects of the Scheme of Affiliation recently adopted by the Society.

In connexion with Mr. Warnerke's lecture, various firms working the collotype process were invited to send specimens of their work. An interesting collection of such prints was arranged, and attracted about 250 visitors.

The exhibition in Pall Mall may, on the whole, be considered as satisfactory.

There were 182 exhibitors, comprising 74 members and 109 non-members. Of these, 19 were foreign exhibitors (3 American, 1 Spanish, 1 Cape, 1 Belgian, 1 Swiss, 5 German, 3 Indian, 2 French, 2 Austrian). Six hundred and twenty-eight frames were hung, containing 1086 photographs, of which 399 were portraits and figure subjects, 508 landscapes, seascapes, and architectural, and 179 miscellaneous, as detailed above.

Two hundred and sixty-two lantern slides were exhibited, and sixty-two pieces of apparatus. The Aerial Graphoscope, designed by Mr. E. S. Bruce, was shown each lantern evening, and attracted considerable attention. The machinery for cutting dry plates, exhibited by the Paget Prize Plate Company, should also be mentioned.

During the exhibition twenty-eight lantern evenings were held, as against six or seven in previous years. These were well attended, and it is believed that this procedure is an improvement on that of preceding years.

It may be mentioned that some of the slides were contributed by our *confrères* in India, New Zealand, and Tasmania.

The number of tickets of admission issued free to members for the lantern evenings was limited, in order to avoid the inconvenient crowding previously experienced, and to make the exhibitions pecuniarily self-supporting. The financial result of this and the other arrangements adopted is fully dealt with in the Treasurer's Report.

The library has now been placed in order, and increased by the addition of about 180 new volumes.

It will be seen that the possession of its own home has enabled the Society to do a good deal of practical work which was formerly impossible. As examples of this may be mentioned the technical lectures, the exhibitions of colour work and collotype work, and the arrangement of the library in such a way as to be of practical advantage to members. The rooms have, on several occasions, been lent for meetings intended to promote the advancement of photography.

The possession of premises has also rendered possible the adoption of the Scheme of Affiliation above referred to, under which a certain number of societies have been affiliated, as already announced. Steps are being taken to carry out, as circumstances permit, the various objects contemplated by the scheme.

Great credit for the work carried out during the past year is due to the Assistant Secretary (Mr. H. A. Lawrance), who has done much more than was asked or expected of him at the time his services were engaged.

The question of lens and other standards, referred to in the last Annual Report, is still under consideration. In consequence of this subject having been brought before the Photographic Congress at Brussels, it has been thought advisable to postpone further action until the decisions of the Congress are published, after which the delegates appointed by the Society will be free to make their report.

The report of the Council was adopted, as was also the Treasurer's report after some discussion, in the course of which Mr. W. S. Bird (the Hon. Treasurer) explained that, but for the Guarantee Fund, the Society would not have had its own home during the past year. That fund was for three years as a set-off for deficiency of income, and with it there would be no loss to the Society for that period. This year they had had to call up each pound that was guaranteed, but next year he hoped it would be less. With ordinary caution there would be no necessity to interfere with the capital fund for the next two years. He suggested the formation of two small committees, one for increasing the number of members, and the other for considering the expenses of the annual exhibition, and the possibility of getting a more successful exhibition at less cost.

The Scrutineers reported that the following had been elected as the Council for the ensuing year:—*President*: Captain W. de W. Abney, C.B., F.R.S.—*Vice-Presidents*: Messrs. T. S. Davis, F.C.S., J. Glaisher, F.R.S., Sir H. T. Wood, J. Spiller, F.C.S.—*Council*: Messrs. W. Ackland, G. L. Addenbrooke, W. Bedford, W. S. Bird, A. Cowan, T. R. Dallmeyer, W. E. Debenham, W. England, J. Gale, F. Hollyer, F. Ince, Dr. G. L. Johnson, H. Chapman Jones, F.I.C., F.C.S., A. Mackie, Captain A. M. Mantell, R.E., A. Pringle, J. W. Swan, J. Traill Taylor, Professor J. M. Thomson, F.I.C., F.C.S., L. Warnerke.—*Treasurer*: G. Scamell.

The President, having declared the Council duly elected, said it remained for him to express his thanks to the Society for the confidence placed in him

for so many years. Many as those years were, from the first moment to the present he had done his best in order that the Society should take up a solid position, one that should increase photography and advance its interests in every way possible, and never in the slightest degree had he deviated from that position. The advance in photography since forty years ago was great indeed, but he believed that there was still a greater future before it. He joined the Society as a working photographer, but for years he had had other exacting duties which had prevented him from following many of the discussions which had taken place. Their President now was a different man, who could so occupy himself that he was quite *au fait* with what was passing. In inviting Captain Abney to take the Presidential chair he assured him that he did so with the greatest pleasure, and in the hope that during his presidency the Society might advance to such a degree that whenever the time came for him (Captain Abney) to part from the chair, he could look back to his occupation of it with the greatest pleasure.

Captain W. DE W. ABNEY said that he had a painful duty to perform. This was, although he had been elected President of the Photographic Society of Great Britain, to at once resign. His refusal of the nomination was, unfortunately, said to have gone in too late. He begged that his name might be obliterated from the balloting list, as in the interval between the time of nomination and his acceptance a great deal of hard work was entailed upon him which he could not possibly give up. New duties had also been forced upon him, and he found he should not be enabled properly to do his duty in the chair. He felt that the interests of the Society would suffer if he did not attend regularly, and devoted as much time to it as he ought to do. The Society was in a critical position, and a great deal of work would be created by the affiliation scheme. Things during the past year had not been so harmonious as they might have been, and he had not the courage to face a want of harmony. He should have been proud to serve, but his want of time compelled him to place his resignation in the hands of the members.

Mr. GLAISHER said he would exercise the influence of an old friend to tell Captain Abney that there were four Vice-Presidents, and he pledged himself that every one of them would do his best to assist him. He appealed to Captain Abney to allow himself to be inducted into the chair, and said that his success in that position would be the success of the Society.

Captain ABNEY, in yielding to the appeal, took the chair amid great applause, and said he would do his best, but they must take him with all his shortcomings.

Votes of thanks to the scrutineers, to the auditors, to the late Hon. Treasurer (Mr. Bird), were carried by acclamation.

The PRESIDENT (Captain Abney) moved a vote of thanks to the retiring President for his services during the past year. He wished him many years of happiness and health, and hoped he would never desert the old ship, but would come to the meetings of Council, and thus continue to exercise the influence of a President without the name.

Mr. GLAISHER briefly and feelingly acknowledged the vote. A change of President and a change of blood were necessary. Perhaps he himself had got fixed in a groove. He was pleased to have received their approbation, and thanked them for it.

In acknowledging a vote of thanks to him, proposed by Mr. Spiller, Captain A. M. Mantell said the work during the year was heavy, but he delighted in it. With regard to the future, if it was intended to ask him to continue as Hon. Secretary he would not be able to stand, as he lived at too great a distance from London.

This concluded the meeting.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 4, Mr A. L. Henderson in the chair.

Messrs. S. J. Beckett, Symonds, and B. F. Winks were unanimously elected members.

The Fry Manufacturing Company presented the Association with a copy of *Lantern Slides and How to Make Them*, by Mr. A. R. Dresser, and the Eastman Photographic Materials Company sent two dozen packets of bromide paper for distribution among the members.

Mr. W. COLES said that at a former meeting Mr. Freshwater had read a communication from a friend in India implying that bromide prints lacked permanency in damp climates, and Mr. John Howson had stated positively that bromide or chloride prints were absolutely permanent, and had quoted certain authorities in support of the statement. He (Mr. Coles) called Mr. Howson's attention to the fact that deterioration existed in such prints, but was told that it was not the case with prints prepared by the Ilford Company. He produced two copies of the ALMANAC for 1887, having alpha prints as frontispieces prepared by the Ilford Company. One of them had certainly deteriorated, as they could see, and he would like to know whether it was due to iron in the paper or improper fixation. There was no doubt that gelatine prints were more permanent than albumen prints under certain conditions, but gelatine in contact with paper that was damp was liable to absorb moisture and change in the air. Professor W. K. Burton had been quoted as saying that bromide prints were absolutely permanent, but he (Mr. Coles) thought that Mr. Burton was too careful to make such a statement. What he said was that he saw no reason why such prints should not be permanent. There was no writer more modest or careful in his statements than Professor Burton. The two copies of the ALMANAC had been kept together in a box most of the time in a dry room, where there was no gas.

Mr. W. E. DEBENHAM said he thought that if any one gave out such prints as permanent, after what Mr. Bolas said a few weeks ago on the subject, they would be doing a very great wrong. It was a great mistake to attribute fading to the albumen or the gelatine; the vehicles were rather the accidents than otherwise. The condition in which silver was thrown down by development differed from that obtained by printing out.

A print from the margin of the deteriorated print was handed to Mr. Haddon, who undertook to test it.

The subject for the evening was *Means of Obtaining Clouds in Negatives at the Time of Exposure*, and a few prints having fine cloud effects, produced by means of Micklewood's shutter, were handed round. It was understood that the shutter would be forthcoming at a future meeting.

Mr. DEBENHAM suggested that something might be done by the use of a yellow screen either inside or outside the lens, and slanted in different directions. If outside, and tilted, the lower part of the picture would be a larger thickness of the yellow screen than the upper, and so one could get a great deal more obstructing power with the sky than with the foreground.

Mr. E. MILNER thought that a good many clouds were lost by over-exposure. His method of getting clouds was to expose correctly, and use a small amount of pyro in the developer to commence with.

The CHAIRMAN remarked that he had some clouds in a negative which had been over-developed; there were no clouds until the negative was reduced. Mr. Dunmore had sketched some clouds on ground glass for him, which could be included in a negative by superposition.

Mr. J. S. TEAPE exhibited a number of prints, the clouds in which had been obtained in the negatives. They had been developed with a very small quantity of pyro to start with.

Mr. MILNER said that a thin film sometimes gave good clouds through there not being sufficient silver on the plate to clog up the skies.

It was understood that the subject would come under discussion at a future date; and, the Chairman having announced that Mr. S. Herbert Fry had promised a demonstration of his new enlarging lantern on an early occasion the meeting terminated.

Camera Club.—February 4, Sir G. R. Prescott in the chair.—Mr. ARCHER CLARKE gave, on behalf of the Incandescent Light Company, an account of the Company's lighting, and its applicability to various purposes. A demonstration of its use in the optical lantern was given, lantern-slide pictures being projected on the screen. The bulk of the evening was devoted to an address and demonstration by Mr. S. Herbert Fry, who practically illustrated the working of a newly constructed enlarging lantern, which, without the use of condensers, gave an equal illumination of a large negative.—On February 18, Mr. S. B. Webber will read a paper on *Some Experiments in Orthochromatic Photography*.

North London Photographic Society.—February 2, Mr. G. J. Clarke in the chair. Mr. Gregory, representing the Eastman Company in the absence of Mr. H. M. Smith, introduced the Company's series of Kodak lantern slides, prefacing the exhibition by a brief description of the latest Kodak improvements. The slides, representing scenery in England and other parts of the world, were highly appreciated, many of them being remarkable for their beauty as pictures, as well as for their perfection as photographs, and all showing the capabilities of the Kodak in its various forms, and the power and delicacy of the rollable film. A vote of thanks to Mr. Gregory and the Eastman Company, and also to Mr. Grover, a member of the Society, who most successfully undertook the duty of showing the slides with a new special lantern of Homphries' make, concluded the proceedings. The next meeting will be on February 16, when Mr. J. Weir Brown will read a paper on *Uranium Toning of Bromide Prints*.

North Middlesex Photographic Society.—February 8th, Mr. C. Beadle in the chair.—Thirty-seven members were present. Number of queries were found in the question box, ranging from the elementary to the abstruse, and, as is frequently the case, the simplest of the queries led to animated and interesting discussions. The Chairman produced a very successful example of combination printing. As the foreground, printed from one negative, projected irregularly into the middle distance printed from another, details of working were asked for. The CHAIRMAN said that, after printing the foreground, he had painted it over with burnt sienna, finding it much easier than cutting out a mask. The distance was then printed in from the second negative. Mr. Cox passed round a number of negatives and prints showing marked peculiarities in development and general treatment. He also exhibited a shutter capable of giving exposures from one-tenth of a second to any longer duration the operator might require. Mr. Marchant then showed the fuzee flash-light apparatus, by the aid of which two portraits were taken, an extra-rapid plate lens working at *f*-6. These were developed successfully by Mr. H. Smith with para-amidophenol. Mr. SMITH read a short paper on the developer, giving formulæ and his experiences with it, and showing negatives of great softness and good printing density which he had obtained by its use. Mr. Gandon then presented the Society with a very fine framed enlargement of a portrait of the President, which will in future adorn the walls of the room. Mr. Chipper passed round for inspection some cheap lines in cameras, lenses, &c. A lens of 4½ inch focus, rapid rectilinear, working at *f*-8, which a member had found, by trial, to cover a half-plate when working at *f*-22, and selling at 4*s.* 6*d.*, attracted much attention as being suitable for hand cameras. The annual dinner was announced to take place on March 12th. Votes of thanks to those who had taken part in the work of the evening brought an interesting and enjoyable evening to a close. February 22, Mr. T. Smithies Taylor will address the Society on *The Use and Design of Photographic Lenses*, illustrated by means of the lantern, and will explain how beginners may test lenses for standard qualities.

Polytechnic Photographic Society.—February 5, Mr. W. E. Debenham in the chair.—Mr. H. W. BENNETT read a paper on *Elementary Notes on Photographic Lenses* [this will appear in a future number]. After the paper had been read, and the various diagrams explained, the CHAIRMAN emphasised some of the important points and the almost boundless field of study which the subject of the paper presented. Before the meeting closed, Mr. Debenham drew the attention of the members to the importance of backing their plates, and gave them some sample bottles of a preparation which he considered most useful for the purpose. The preparation consists of burnt sugar, or caramel, with a little gum water and spirit, and this is poured on to burnt sienna to form a thick cream. The mixture is applied to the backs of the plates with a soft camel-hair brush. Mr. Debenham said that he did not trouble to wash off the backing before development, as he had not found it affect the developing solution in the least.

South London Photographic Society.—February 1, the President (Mr. F. W. Edwards) in the chair.—A number of 24×20 uranium-toned enlargements on Naturalistic bromide paper were sent by the Fry Manufacturing Company. Donations of books to form the nucleus of a club library were then announced, after which Mr. MAURICE HOWELL, M.P.S., read a paper on *The Chemistry of Photography*. The lecturer dealt with the subject historically, noting carefully the chemical changes which took place in working the earlier processes of photography, viz., Daguerreotype, calotype, Talbototype, Archer's collodion process, as well as the modern methods of producing negatives and positives. A large number of experiments, made from time to time with the view to improving the art, were also dealt with. It may be mentioned that Mr. Howell's interesting collection of Talbototypes of his own production at the Crystal Palace Exhibition, 1889, were much admired. Mr. Slater brought to the meeting a new pattern half-plate camera of good material and workmanship, which he is about to put on the market to be sold at the low price of 4*l.*, with three double dark slides.—February 15, Meeting at Hanover Hall, Hanover Park, Peckham: *Artistic Photography*.

Brixton and Clapham Camera Club.—February 4, Dr. Reynolds in the chair.—The Chairman briefly introduced Mr. PRINGLE, who gave an address on *Development*. The subject, he remarked, was a broad one, and he would confine his attention to the main features of the several developing agents. He denied the theory that after a plate had been exposed, rightly or wrongly, development could have no material effect on the result. A photographer requires to produce a good negative, *i.e.*, one which will produce a good print. To attain this result one had the option of five developers, viz., pyrogallol, eikonogen, ferrous oxalate, hydroquinone, and para-amidophenol, and he advised their use as follows:—Hydroquinone, for pictures requiring strong contrasts, lantern slides, &c.; Eikonogen, where a minimum of exposure had been given, as in hand camera work; Ferrous oxalate, where extreme clearness was required (Mr. Pringle said he did not consider this was used as much in this country as it should be); Para-amidophenol (rodinal), the same remark applies here as to eikonogen, but its action is even quicker. Mr. Pringle said he considered rodinal a good developer, but recommended that the amount of water to be added should be only two-thirds of that contained in the instructions. In conclusion, the lecturer said that where there was any doubt as to exposure, and for general all-round work, he had found nothing to come up to good old pyro and ammonia.

Lewisham High-road Camera Club.—February 5, Mr. Alfred H. Miles in the chair.—Mr. J. TRAILL TAYLOR gave an address on *Some Bye-paths in Photographic Optics*. His remarks had main reference to the influence of concave lenses when used in conjunction with ordinary photographic objectives. Lenses and pictures were shown in illustration of his remarks, and copious use was made of the black-board by the speaker.

Croydon Camera Club.—February 1, Annual Meeting.—The elections resulted as follows: *President:* H. Maclean, F.C.S.—*Vice-President:* B. Gay-Wilkinson.—*Council:* Messrs. Arthurton, Blow, Burrows, Hirst, Neeves, Oakley, Overton, and Packham.—*Auditor:* W. Daniells.—*Treasurer:* A. J. Sargeant.—*Secretaries:* Messrs. White and Isaacs. The annual dinner will be held next month. On February 15 Mr. Weir Brown will lecture on *Warm Tones on Bromide Paper*.

Richmond Camera Club.—February 5, Mr. Cembrano presiding.—Monthly lantern show. The attendance at this meeting was about the largest on record.

Crewe Scientific Society (Photographic Section).—January 25, Mr. Earl presided.—Mr. PAUL LANGE lectured on *Norway and its Wonders*. Mr. Lange said he was proud to be called upon to deliver a lecture on so interesting a country as Norway, and, after describing this favourite resort, he hoped it would result in inducing many present to pay a visit to that country. Having described the route from Crewe to Hull, thence by steamer to Bergen, he gave a description of the most enjoyable route for tourists and photographers to follow. The views thrown upon the screen were excellent, giving an admirable illustration of life amongst the mountains of Norway. The views were charming in themselves, and the lecturer's comments on the beautiful scenery greatly increased the pleasure of his audience. The cloud studies were magnificent.

FEBRUARY 3.—A *conversazione* in connexion with the above Society was held, when a good display of photographs was on view in the Council room, including a collection by Mr. Paul Lange, Mr. A. H. Hignett (Crewe), Mrs. J. U. Hignett (Chester), photographs and transparencies by members of the Section, and a display belonging to the London and North-Western Railway Company, lent by Mr. F. W. Webb. The Crewe Photographic Company, Limited, had an excellent show, including the Autotype and Alpha processes. On February 24, Mr. A. H. Hignett on *Highland Scenery*, to be illustrated by about 120 limelight views.

Halifax Camera Club.—February 1.—An exhibition of slides was held at the Club rooms. It was decided during the evening to have a portrait competition at the next meeting, confined to the amateur members of the Club, the portraits to be taken in the Club studio; and Mr. M. Manley offered an automatic plate-rocker for the best portrait exhibited.

Leeds Photographic Society.—February 4.—Dr. E. H. JACOB, M.A., lectured on *Practical Photo-micrography*. The lecturer described his apparatus, which was an adaptation of an ordinary microscope, and comparatively simple, yet efficient, as he proved by some excellent lantern slides shown upon the screen. The lecturer read a letter from Mr. William Kingsley, a brother of the late Canon Kingsley, which he had just received, and in which he incidentally referred to his suggestion, in a paper read before the Society of Arts in 1851, of the possibility of photographing the heavens, and by that means discovering new stars. The suggestion was then so little thought of that it was omitted from the paper as published by the Society. The Society has decided to hold an exhibition of members' work during the current year.

Lewes Photographic Society.—February 2. Samples sent by the Eastman Company of their new rapid bromide paper were given round to members, many of whom promised to bring the results of their experiments to the next meeting. The result of the competition for the best print illustrating *Toil* was announced, the award going to Mr. Percy Morris, who takes the exposure-meter presented by Mr. Watkins for competition among members of the Society.—Mr. WIGHTMAN then read an able paper on *Platinum and Bromide Printing: A Comparison and Contrast*. In dealing with the subject, he pointed out that, although in a properly executed platinum print there were certain qualities which could not be excelled or even equalled by bromide, yet for ease and certainty in working, combined with its adaptability more or less for the greater percentage of negatives, the balance lay in favour of the latter.

Midland Camera Club.—February 5, Dr. Hall Edwards in the chair.—The HON. SECRETARY reported that Mr. W. J. Spurrier had been elected Assistant Hon. Secretary and Librarian. A suggestion was made that at the end of the winter session a *conversazione* and exhibition of members' work be held, and the Council are considering the matter. The Hon. Secretary showed Chadwick's lecturer's reading lamp, and Dr. Huxley the "Holiday" developing lamp. Professor ALLEN then gave his paper upon the *Philosophy of Restraint in Development*, which he illustrated profusely by diagrams, &c., upon the blackboard, samples of negatives, and lantern slides. In the course of an interesting paper he said he could only agree with Hurter & Driffield up to a certain point, and showed three slides as a proof. Each had received about fifty times the correct exposure, one developed with normal developer completely solarised, one restrained considerably was about right, the third, with previous soaking in restrainer and large proportion in developer as well, gave the exact appearance of under-exposure. He also expressed a very strong objection to weak developers, and explained his reasons by diagrams of the film and image formed.

Rotherham Photographic Society.—February 4, Mr. E. Isle Hubbard, M.S.A., presided.—The SECRETARY reported with regard to the arrangements for the second annual exhibition, to be held in the St. George's Hall, Rotherham, on Tuesday and Wednesday, February 23 and 24. The venture, he said, promised to be most successful from a photographic point of view, and the loan collection of exhibits would greatly add to the interest. Specimen packets of Eastman bromide paper were distributed for trial purposes. Mr. G. T. M. Rackstraw (a Vice-President) gave a demonstration on lantern-slide making by contact, using ordinary commercial lantern plates and hydroquinone, with hydrate of soda developer. Toning, &c., was also illustrated.

Sheffield Photographic Society.—February 2, Mr. B. J. Taylor in the chair.—The SECRETARY announced that the Eastman Company had sent a few samples of their new bromide paper for trial by the members.—The prizes for the annual competition were presented to the following gentlemen, viz., Messrs. Crowder, Beck, and Bromley. The negatives of the winning pictures were passed round and admired.

Edinburgh Photographic Society.—February 3.—The first business was a demonstration of some of the different methods of carbon printing and development by Mr. James McGlasham. The lecturer stated that his experience had not been a lengthened one with this process, but, so far as he had worked it, and with sedulous care, he felt certain he was right in bringing before the Society the results of his experiments. Mr. McGlasham then proceeded with his demonstrations of practical work, showing everything but the actual exposure under a negative, with much satisfaction to the amateur portion of the audience. Messrs. E. L. Brown, John Ednie, and H. Houstoun Ross were balloted for and admitted members. In the report of the Council upon the proposed club rooms for the Society, it was stated that return postcards had been sent to all the members in full connexion with the body, 370; and that of this number only 111 had interested themselves in the question, and of that number 74 were in favour of the proposed change in the constitution of the Society, and 35 voted against the change. In the circumstances, action was delayed, especially with relation to proposed premises in George-street, but remitted the whole subject back to the Council to endeavour to obtain not only working and recreation rooms, but also a sufficient hall for the general meetings of the Society and the transaction of its ordinary business.

Glasgow Photographic Association.—February 4, Mr. William Lang, jun., F.C.S. (President), in the chair.—Three new members were elected, viz., John Brown, 8, Gordon-street; Alexander Macdonald, Brodick; Charles Sweet, Rothesay. It was unanimously agreed that the Association become affiliated with the Photographic Society of Great Britain. The construction and use of Dallmeyer's new telescopic-photographic lens were explained to members. Views were shown on the screen, the subject being a church half a mile distant, taken from the same position with an ordinary lens and with the new lens, the size of the image produced by the latter being six times larger than that by the former instrument. Uranium toning of bromide prints and of transparencies was discussed and examples shown.

Dundee and East of Scotland Photographic Association.—February 3, Mr. J. D. Cox (President) in the chair.—The PRESIDENT intimated that the Council had voted the sum of 3*l.* 3*s.* to the Maddox Testimonial Fund. He also intimated that the Association had affiliated with the Photographic Society of Great Britain. A demonstration was given of the stripping and enlarging powers of "Cresco-Fylma." Two negatives were treated with the solution, and in a very short time the films were removed from the glass. After soaking for some time in water the films were floated on to a larger-sized glass. This was done successfully, there being no distortion, but very little enlargement, probably owing to too cold water being used for washing and also to the plate not being suitable. "Cresco-Fylma" should prove useful for removing the films from cracked negatives, allowing them to be placed on new glass; and also in carbon printing, where a reversed negative is necessary to save double transfer. Demonstrations in enlarging were then given by Mr. G. G. Maclaren, who exhibited his method of working. His apparatus consisted of a two-wick Sciopticon lantern, to which was attached a quarter-plate camera. The negative was placed in a groove inside the ground-glass screen, thus having the ground glass between the condenser and the negative, this arrangement getting rid of the light mark on the enlargement caused by the dark space between the flames. An enlargement was successfully exposed and developed before the meeting. The prizes in the "Animal Studies" competition were awarded to (1) V. C. Baird and (2) G. G. Maclaren.

Photographic Society of Philadelphia.—January 13, Mr. Joseph H. Burroughs in the chair.—Mr. F. E. Ives exhibited one of his cameras for composite heliochromy. With a lantern objective having only one (large) aperture, this camera produces three sharp images, exactly alike as to size and perspective and on one plane. Mr. Ives stated that such a camera would prove to be a practical necessity for composite heliochromy, and he regarded it as an optical triumph. The subject announced for discussion, viz., *The Permanency of the Undeveloped Image on Dry Plates—What Conditions influence it?* was next taken up. M. Pancoast stated that some time ago he purchased three dozen plates of a well-known make. He used one dozen with excellent results at the time of purchase; the rest he laid aside, and did not use them until May, 1891, when he exposed four, and found them all right. On May 16 he exposed six more on landscapes and interiors, giving rather full exposures. These were kept in the holders until August 12, then transferred to a box containing old-style separators and put away in a dry place, standing on edge. A week ago Mr. Pancoast commenced development. On placing a fully exposed landscape in pyro and potash developer, no trace of image appeared. A second plate, treated to a dilute alkali bath previous to the pyro, then subjected to a prolonged and forced development, produced no better result. A third plate, landscape, hydroquinone developer, still no result. A fourth plate was next tried in a mixed eikonogen and hydroquinone developer, and, strange to say, a very fair negative was the result. He then tried some of the unexposed plates on neighbouring houses, producing good negatives. A plate of another man, purchased in 1889 and packed with the others, subject to the same conditions, on development with hydroquinone, resulted in a good negative. Dr. Mitchell said it was generally recognised that eikonogen would bring out details that pyro would not. He had several times used pyro on much underexposed plates, and, notwithstanding the use of a large quantity of alkali, he got hardly any image. He remembered one or two cases where, noticing fog on the edges of the plate, he had poured the developer off, washed the plate, and put it in eikonogen developer, the result being an almost instantaneous flashing up of the image—so quickly, in fact, as to give one the impression of an over-exposed plate. While he could not explain or give any good reason why Mr. Pancoast's plates did not come up properly, he thought there was no question that eikonogen would often bring out an image that pyro would utterly fail to produce at all. Mr. Earle stated that he had tried similar experiments in this direction. He had purposely carried exposed plates in the holders for six months and more, and, on development with the eikonogen, had obtained as good negatives as he ever did. The developer was eikonogen—not hydroquinone and eikonogen—from which he judged that in the mixed developer it was the eikonogen that was the more active agent. Mr. Carbutt said that his experience had been quite contrary to Mr. Pancoast's. He had made several hundred exposures in Europe in 1890, and they were not yet all developed. He had developed from time to time, and had found no decrease in the image—if anything, rather an increase. Last week he developed two packages that had been exposed in 1889, and they had attained such an extreme rapidity that it took a very acid ferrous oxalate to get any decent image at all. With the ordinary eikonogen and hydroquinone developer they were entirely beyond control. Dr. Mitchell said that eikonogen, under certain aspects, was next to the new para-amidophenol, a very energetic developer. It seemed to go to a certain point, however, and then stop, so that, while one got a great deal of detail in the image, the required density would have to be obtained from hydroquinone. A combination of eikonogen and hydroquinone was very like a partnership between good fellows. There was one fault which he believed existed in all gelatine dry plates, and which increased with the rapidity of the emulsion, and that lay in the boiling of the emulsion. In this boiling the silver reaches a state of strain, so to speak. The particles of silver, being in a state of molecular separation, seem to be hanging at a point where there is a certain amount of tension. Now, some unknown circumstances—it may be the character of the weather, the temperature, or the condition of moisture in the atmosphere at the time the emulsion is made—serves to start a disruption, gradually at first, but increasing, so that after a while the emulsion becomes utterly insensitive. Then, again, it may be influenced by the action of the light in making the exposure. The impression of the light on the sensitive surface may be just enough to start molecular disruption, which increases in a few weeks, utterly changing the character of the plate and preventing any image being brought out. Two or three summers ago a former member of the Society made an excursion to the Adirondacks, taking with him quite a large number of plates. They were a new lot, just from the factory, and he omitted to test them before he went away. However, he made a number of exposure, and when he came back started in to develop. He failed utterly in getting an image; the whole lot were bad. Mr. Bell asked Mr. Carbutt if he knew whether manufacturers to-day used any tanning at all in making the emulsion. Mr. Carbutt could only answer for himself. He did not use any. Mr. Chapman had been troubled with the film negatives darkening from the edge inward when kept several months after exposure, the trouble increasing with the length of time they were kept, until, in some cases, it covered the film entirely. Mr. Wilson suggested soda in the packing or separating paper as the cause. Mr. Carbutt recommended packing in waxed paper as a preventive of fogging from the edges. Mr. Brown favoured the old-time method of packing plates tightly together with a piece of orange post-office paper between each pair. Plates packed in that way, very tightly wrapped together, he had kept for four or five years, and they were as good at the end of that time as when he bought them. The present method of separating plates permits the circulation of air between them, carrying with it gases and impurities which would tend to injure the plates, and bring about the blackened edges spoken of by Mr. Chapman, extending finally to the centre of the plate. Some time ago he placed some plates, that were working admirably, into his plate-holders, where they remained over two months. When exposed and developed, he found this blackening upon the edges. Curiosity prompted the trial of some of the plates he had kept in a tin box in the same paper packages in which they had been received. Result: no blackening. In the former case the plates in the holders were exposed to the air, whereas those in the paper box, enclosed in a tin box, were kept from contact with the air; none could get in. He would suggest that the makers pack their plates closely together, rather than separate them, as was now done. In his experience, those packed tightly did not rub or scratch.

Madras Amateur Photographic Society.—January 11, Annual General Meeting, Mr. Dunsterville (President) in the chair.—The Committee's annual report was read, showing excellent results so far as the numbers and financial position were concerned, there being more members on the rolls, and a cash balance in the Treasurer's hands of nearly 600 rupees; but the work done during the year was not satisfactory, the number of competitors at the half-yearly competitions being smaller, and the pictures exhibited not being up to the former high standard. It was also pointed out that the number of members attending the monthly meetings was getting smaller and smaller. The President, who originally had had most to do with the formation of the Society, had consequently given notice of a resolution that it would be advisable to close the Society. In bringing forward this proposition he stated that he would be exceedingly sorry if it were carried; he had given the notice in order to try and bring matters to a climax, and to get the members to do something to prove their interest in the Society—if they had any! The Secretary seconded the resolution, stating that he agreed with all the President had said. A general discussion then arose, in which the members present gave their ideas of what might be done to make the Society of more use and interest to its members; and, in the end, it was proposed by Mr. C. Mickie-Smith, and seconded by Mr. Stuart, that the Society should not be wound up, but that it should be left to the new Committee, to be elected that evening, to do whatever they considered necessary to ensure better attendance at the meetings, and more competition at the half-yearly prize givings. The amendment was carried *nem. con.* The following were then elected as the Committee for the ensuing year:—*President:* Mr. C. Michie-Smith (Government Astronomer).—*Vice-Presidents:* Messrs. E. W. Stoney, M.I.C.E., and C. Slater.—*Committee:* Surgeon-Major S. L. Dobie, I.M.D., Messrs. W. M. Gerrard and A. E. Lawson, Dr. G. Offert, Ph.D., Captain A. D. G. Shelley, R.E., and Mr. A. O. Wood.—*Secretary and Treasurer:* Mr. F. Dunsterville, Royapuram, Madras. It was then resolved to subscribe two guineas to the Maddox Testimonial Fund, and, with votes of thanks to the outgoing President and Secretary, the meeting closed. If photographic dealers and manufacturers will send the Secretary samples of their goods or catalogues with prices, he will be very happy to distribute them among the members, who reside all over the Madras Presidency; the number of members is about fifty.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

FORENSIC IDENTIFICATION.

To the Editor.

Sir,—Having had the privilege for three or four years of being numbered among the invited guests who partake of the hospitality and obtain the publicity afforded by The British Journal Photographic Almanac; having also had the similar privilege in the *Photographic Yearbook*—a publication upon which, with true editorial catholicity, you have just bestowed a passing word of commendation; I naturally, and not without some measure of indignation, resent the insinuations of your correspondent, "T. H. W."

Of those eminent photographic firms to whom were consigned the reproduction of the portraits that erstwhile appeared in your pages, pray, which of them does "T. H. W." accuse of complicity—with having "dodged" the exemplars? There can be but one interpretation of that term. It is an utterly baseless accusation. Does "T. H. W." expect a civil rejoinder to that insinuation? Does he imagine that one at whom he sneers as a l'anglois will deal with him as a gentleman? The crude immaturity of his assumed literary qualifications is at once revealed by the designation he has applied to a personage who is merely one of George Colman's clever dramatic creations, but whom "T. H. W." styles "that arch-impostor, Dr. Pangloss."

The entire communication of "T. H. W." is simply a series of much-diluted sneers; and it is an old and obvious remark that "no one can refute a sneer." I refuse to follow your correspondent into the unwieldy topics into which he enters at such length. In your columns, devoted to photography, what concern have I with what the Tichborne Claimant did or did not recollect? Or with the statements, *pro* and *con*, of the prosecution and the defence? One single remark in that direction sufficiently meets the whole farrago. The identity of the Claimant was decisively attested, in terms the most precise and explicit, by the medical attendant of the Tichborne family, by the legal adviser of the family, by the banker of the family, by the clergyman of the parish, and last, but not least, by the mother who bore him. Of these five deponents, but one, the venerable and much-respected Hon. Treasurer of the city of Winchester, now survives. Thus, over and over again, might one set of statements be pitted against another. But are your pages the place for such mere bandying of assertion and counter-assertion? To such debates you would be fully justified in denying admission.

The style of attack in which "T. H. W." has chosen to indulge forbids my adding one word in defence of the views I have laid before the readers of The British Journal Photographic Almanac. Behind the mask of his three initials, "T. H. W.," may launch forth into whatever innuendo and insinuation it may please him. But, should he see fit to use only the language of a gentleman, or, in event of his having the courage of his

convictions, should attach his name to his diatribes, then, and only then, can I further notice him.

"Possibly," says "T. H. W.," in a concluding passage, "possibly, in the ALMANAC of 1893, *a sly sense of humour* may offer the apologist an open door." And for what set purpose, may I ask? "T. H. W." supplies his own version of the reply. For "prostituting photography to so base a use." How little recked your correspondent, when he penned this phrase, that there intervened but only that slip of manuscript between himself and the veritable personality that, by "*a sly stroke of humour*"—merely a lick with a wet tongue—had laid bare the most cruel and the most dastardly fraud that the villains of the plot had concocted, namely, the obliteration of the well-defined but much-maimed thumb from the original Daguerreotype.—I am, yours, &c., W. MATHEWS.

Clifton, Bristol, February 6, 1892.

GRADATION.

To the EDITOR.

SIR,—I am glad to find that this subject is attracting increased attention. May I point out a misunderstanding which seems to exist in the minds of some of your correspondents? It is assumed that, if two negatives of the same subject have their corresponding densities in the same ratio, they may be made to give identical paper prints. This is by no means true. A negative of four densities, 0, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, cannot give an identical result with another of densities, 0, 1, 2, 3, although the ratio of gradation is unaltered. Not only this, but equivalent results cannot always be obtained from one and the same negative, as may be tested by printing in platinotype, silver, and developed bromide.

Some eminent authorities, it is asserted, disagree with Messrs. Hurter & Driffield; but they should do as these gentlemen have done, state their case in a manner that others may repeat, giving numerical results in support of their argument. I do not say that the matter is beyond dispute, but, in the face of the methodical, well-detailed experiments of Messrs. Hurter & Driffield, an opponent of their views should do more than vaguely quote the opinion of eminent but unnamed experts against them. Can anything more definite as yet be found? Captain Abney has two negatives, we are told, which disprove the position of Messrs. Hurter & Driffield. Will Captain Abney compare the opacities of a few corresponding parts of these negatives, and give the numerical results? It could then be ascertained whether these do not give a constant density, differing in each plate, due to stain, and the opacity of glass and gelatine, and a remaining series of densities due to reduced silver, obeying the law of Messrs. Hurter & Driffield. It seems to me theoretically possible to evade this law by adding a dyad bromide to the developer, thus partially destroying the latent image, and converting an over-exposed plate into a normally or under-exposed one; the great difficulty would be to so modify the developer as to obtain normal results from an under-exposed plate.—I am, yours, &c., R. C. PHILLIPS.

Arts Club, Manchester, February 7, 1892.

"OIL ON THE WATERS" IN PHOTOGRAPHY.

To the EDITOR.

SIR,—We have often heard of the effect of "oil on troubled waters," and I wonder if any of your readers have ever thought of applying it in a photographic way. I have, and with considerable success, as I think you will admit when I tell you what I have done, and the result as shown by the accompanying photograph.

I was called into the country, a few miles out, to photograph a house, group, and several views about the place. The house was situated on a hill at the end of a narrow valley. Down below was a pond, about half an acre in extent, but the draught up the valley covered the surface with ripples. In the distance this did not matter, but when I went down beyond the water to take a view looking up to the house, the ripples became a serious matter, and I determined to try the effect of the oil. knowing the place, I took the precaution to provide myself with a bottle of olive oil (about three ounces). After I had selected the point from which to take the view, and persuaded the cattle and sheep to keep within bounds, I put my plate in the camera, and threw the oil from the bottle, as much to the right as possible, *the direction from which the slight wind was coming*. With astonishing rapidity it spread over the pond, and, although I was fairly quick in exposing, I was not so quick as I ought to have been. However, there was a remarkable subsidence of the ripples, and the reflections in the water are discernible, which they were not before.

I should like to know if any of my brother professionals have tried the plan. If not, I would advise them to do so when any such occasion occurs; only let me advise them to use more oil—preferably linseed—and throw it on the water close to the side from which the wind is blowing, and I think they will secure good reflections even in windy weather. The wind, as you see, moved the trees but slightly, but the ripples were rather heavy, owing to the position of the pond.—I am, yours, &c.,

London-road, Ipswich, February 7, 1892. W. VICK.

NEWMAN AND ADAMS'S PLATE SHEATHS OR CARRIERS.

To the EDITOR.

SIR,—I notice in the current issue of THE BRITISH JOURNAL OF PHOTOGRAPHY the specification of a patent taken out by Messrs. Newman & Adams, for improvements in plate sheaths or carriers, the point of which appears to be the construction of such sheaths or carriers, with a "set back" to prevent contact between the backs of the carriers and the following plates. Will you kindly allow me to place on record, in case of any future necessity, that in the hand camera made by me and shown some years since at the North London Society, the principle of the "set back" was adopted, and called attention to. In that camera, which is tolerably familiar to many of the members, the carriers are simple sheets of dark cardboard, having ledges at bottom to support the plates, the outer edges being thickened by means of a narrow strip of cardboard glued on the back. This was seen to be necessary from the first to keep the plates clear of the rubbing which would otherwise have occurred in removing the carriers as the plates were successively exposed. The camera and carriers have now been in use a long while, and I find no need of any alteration, while, in a stereoscopic camera made (and shown) by me last year, an additional strip of card is glued up the centre of each carrier, to take the thrust from the back which would otherwise have a tendency to make the plates spring in the middle.

There did not seem to me to be, nor should I have thought of claiming any invention in the matter at the time, but I should be sorry if, for want of a word now, any of our friends who may have copied or thought of copying my simple carriers should be afraid of infringing any rights in the matter. It is, of course, possible that I may have missed the point actually claimed in the new patent, but I certainly fail to see any other.—I am, yours, &c., WM. BISHOP.

London, February 4, 1892.

PHOTOGRAPHING "THUNDERBOLTS."

To the EDITOR.

SIR,—I was at the Camera Club when Mr. Maskell projected on the screen a lantern picture of what he said was a "thunderbolt." It seemed to me that the "effect" was caused by a drop of something, possibly hypo, having fallen undesignedly on the plate, either before or after development, and which drop of something had produced slight chemical action on the film.

Those whose dark rooms measure three feet by three feet, or thereabouts, are not unaccustomed to these appearances; indeed, their difficulty is to avoid photographing "thunderbolts."—I am, yours, &c.,

London, February 8, 1892. VULCAN.

PAPER FOR WOODBURYTYPE.

To the EDITOR.

SIR,—We see in THE BRITISH JOURNAL OF PHOTOGRAPHY, February 5 ("Answer to Correspondents," A. Fraser), question as to where proper paper for Woodburytype can be obtained. We beg to inform you it is manufactured by the Rives people in France, and that we are their agents and keep a stock here.—We are, yours, &c., MARION & Co.

London, February 6, 1892.

MR. CIMABUE BROWN EXPLAINS.

To the EDITOR.

SIR,—In the hurry of writing you last week, as well as in my admiration for the frank and delightful outspokenness of your contributor, "A. R. S.," I was guilty of a slip of the pen which, in justice to those I was criticising, as well as to yourself, Mr. Editor, and myself, I ask your permission to correct. The last sentence of the third paragraph should, and was intended to, read, "Charlatan and impostor are the only words which correctly apply to *those given to* such practices *as A. R. S. denounces.*" The omission of the italicised words reduced the sentence to a meaningless and ungrammatical dig at nothing and nobody in particular.—I am, yours, &c., CIMABUE BROWN, JUN.

February 8, 1892.

NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

To the EDITOR.

SIR,—As it will not be possible for you to have report of our approaching Annual Meeting of members of the Professional Photographers generally on February 11 in your next issue, will you permit me to inform your readers that, in addition to the important firms named in previous lists, we have received accession and assent to the principle of "Trade Prices for the Trade only" from the following, amongst others:—B. J. Edwards & Co., Fry Manufacturing Company, Brooke Brookes (Bradford), Birmingham Photographic Company, Limited, &c.

I would desire to point out, with your permission, that the enlarger who supplies the outside public on the same terms that he supplies a *profes-*

sional photographer is not only robbing the man who has to get his bread and cheese by his retail business (and by *that alone*), but he is actually injuring himself in two ways.

The outsider would not, as a rule, object to pay a "gross" price (*versus* trade price) for his enlarged picture, and could not honestly expect to get his *single* order at *wholesale trade price*. Thus the enlarger would get the extra profit from those who prefer to send to him direct. Then the "enlarger" would no longer be the cause of perpetual friction and annoyance between the profession and the retail purchasers.

There are at least some 3000 professional photographers in the kingdom. Surely, then, standing regular orders (in quantities), and their continuous good will ought to have great weight with the "enlargers" as a matter of policy, common fairness, and honesty.—I am, yours, &c.,

D. J. O. NEILL, *Secretary.*

47, *Charlotte-road, Edgbaston, Birmingham.*

TYLAR'S FILTERS.

To the EDITOR.

SIR,—In final reply to Mr. Henderson, allow me to draw attention to his first letter, 22nd ult., testifying to the merits of a similar filter he had used for ten years, and then demurring to your readers how to make them. I am therefore astonished to see his letter in current issue stating "Filtration is a snare and delusion." What are your readers to understand by such paradoxical letters? If Hampshire water is pure as the weather is mild there, well, then, the residents of that salubrious county will not need the filter; but, at present, my experience is that the public are not satisfied generally with the purity of the water they get, by the numerous orders daily received for this "little friend of man."

Our large manufacturing towns are always complaining, and justly so, of the impurity of tap water, and only one day's use of the small filter, when reversed to cleanse same, will show what Britons swallow. Mr. Henderson desires to know where the novelty comes in. Surely this need not trouble him, for it would be difficult to prove anything novel to a learned and scientific gentleman. However, I claim the following advantages, which I think novel to the outside public who have little time to peruse scientific matters.

First, the convenience of adaptation. Secondly, the finish and neat appearance. Thirdly, the simple reversing and cleansing action. Lastly, the price is within the reach of the working classes whom I have catered for many years.

Like a great many expensive and large filters, it is very probable the Hampshire one complained about was not cleansed, and the consequence a slimy mass of water caused by passing through fungoid growths due to the decomposition of organic matters. With the new filter this is impossible as no organic accumulation can take place, hence no fungoid growths. The proof of this latest simple, effective, and economical novelty, I leave in the unbiassed judgment of your intelligent readers.—I am, yours, &c.,

W. TYLAR.

JENA GLASS.

To the EDITOR.

SIR,—You rightly assume, in your note on Jena glass in your last issue, that my remarks at Liverpool were not fully reported.

In reply to your note I had occasion to point out the impossibility of securing greater depth of focus and rapidity together in lenses by altering their distance or using new material, and this was my point when speaking of Jena glass.—I am, yours, &c. T. SMITHIES TAYLOR.

Heatherden, Kirby Muxloe, near Leicester, February 8, 1892.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

To the EDITOR.

SIR,—Will you allow me to announce that on Thursday, February 18, the above Association will hold their Annual Musical and Lantern Entertainment (ladies' night) at St. George's Hall, Champion Hotel, 15, Adelphi-street. Mr. J. Traill Taylor will preside on the occasion, and the programme, as arranged by the Committee, promises to be an unusually attractive one. Thanking you, Sir, in anticipation,—I am, yours, &c.,

THE HON. SECRETARY L. & P.P.A.

London, February 8, 1892.

HISTORICAL NOTES ON PHOTOGRAPHIC GLASS.

To the EDITOR.

SIR,—It appears to me that the time has now arrived when I may do some good by giving an historic record of the uses of glass for photographic purposes. When the Daguerreotype made its appearance, "Patent Plate Glass," was ground and polished on both sides; the size was 2½ × 2, and therefore the cost was not felt a tax of an oppressive character; but, after Goddard made it a great commercial success by quickening the exposure from ten minutes to ten seconds, it received an impetus, which naturally led to large sizes, such as 3¼ × 2¾, and then it rose to 4¼ × 3¼, and ultimately to 5 × 4. Talbot was beginning to attract attention with sensitive paper when size was no longer a difficulty; but the covering, when framed, became a serious consideration, costing, as it did, from 2*s.* 6*d.* to 3*s.* per super. foot. Ordinary sheet or blown glass in those days was of a very inferior quality, and looked not unlike hammered tin-plate. Crown glass was used also, but progressive sizes gradually crushed it out. Sheet glass gradually improved in quality, and occupied the field up to 1864. It was then I felt it possible to get rid of the objectionable sulphur that fixed itself on the surface whilst in process of manufacture. I commenced by laying down slate slabs, covered with fustian, and placed a square block, covered with felt half an inch thick, on the glass, to which a handle was attached, and kept a young man moving it backward and forward over the surface, sprinkling it with rouge and water. This, I found, entirely got rid of the sulphur, and hence the necessity of "Patent Plate Substitute" reduced the cost to 5*d.* per foot. The immense demand made it a necessity to turn it out in large quantities, and ultimately it rose to 70,000 feet in the course of a summer's work. I may state, steam machinery came into use to meet this demand, but this left me with a much greater difficulty to face; that was, to make blown glass optically flat. Now, I mastered both these difficulties by getting a Belgian glass manufacturer (who used wood only for making glass). This got rid of the coal sulphur, and allowed us to improve the process of flattening, whereby the glass so produced became optically flat, and a dozen squares, when placed one upon another, feel as if it was a block of glass. The natural tendency at present is for larger sizes, such as 12 × 10 and 14 × 10. I hear great complaints from professionals, that out of four they cannot rarely get two sufficiently flat, not saying one word of the immense breakage it leads to. This is a terrible loss, and disappointing to the consumer.

The conclusion I come to is, that unless the sensitive-plate maker enters into arrangement with glass manufacturers to make sheet glass with wood fuel, they will find celluloid taking up its place, and their occupation all but gone. I don't mean annihilation, for glass will always be used for portraits in small sizes, such as 5 × 4, &c., and in such sizes it may be looked upon as a bye-product; but large sizes must have more careful manipulation if it is to hold its own.—I am, yours, &c.,

Waverley, Alexandra-road, Birkenhead. JAS. ALEX. FORBEST.

Exchange Column.

**** No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Wanted to exchange, Dallmeyer's 1 B lens, for a long-focus copying camera.—Address, VICTORIA WORKS, Forest Hill.

Exchange, oval embossing press for cartes and cabinets, for head-rest for sitting or standing figure.—Address, J. W. C., 182, Carr-road, Sheffield.

Will exchange, 12 × 12 camera, with one single slide, with carriers for all sizes, and 12 × 10 landscape lens, for modern whole-plate camera, with one or more double slides and rectilinear lens, by good maker (approval).—Address, T. S. SISSON, Levens-park, Milnthorpe.

Wanted a light 10 × 8 camera, Acme preferred; will give in exchange whole-plate studio camera (by Fallowfield), one single and one double slide, nearly new, or studio chair, four backs.—Address, E. HOPKINS, Photographer, 31, Sydenham-terrace, Fratton, Portsmouth.

THE CAMERA IN THE ZENANA.—Photography has penetrated into the zenana. An enterprising native photographer has just established at Hyderabad, the great Mohammedan city in the Deccan, a studio for the exclusive use of the ladies of the zenana of the Nizam and his nobles. It is in charge of an English lady, and stands in the centre of a high-walled enclosure specially constructed to exclude the gaze of the vulgar male species. The proprietor is said to be doing a roaring trade, as the Hyderabad belles are not at all adverse to having their charms immortalised by the camera.

MR. W. I. CHADWICK, of Manchester, gave a talk on *Stereoscopic Photography* at 5, Chandos-street on Friday evening last, and illustrated his remarks on monocular and binocular vision with diagrams of the eye, and upon stereoscopic photography with the apparatus employed for the purpose. He passed round and explained his apparatus. A noticeable point was the simplicity of the working parts and the absence of screws, &c., which so often are a snare and a delusion at a moment of pressure. We learn that Mr. Chadwick will probably have stock of his special apparatus on show and sale at the Fry Manufacturing Company's show-rooms.

ANNUAL DINNER OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—This dinner took place on Monday evening in the Café Royal, Regent-street, about seventy members and friends, including ladies, being present. Mr. James Glaisher, F.R.S. (President), was in the chair. Appropriate toasts were given, the principal one—their retiring President—being given in a graceful and appropriate speech by Mr. W. S. Bird, who alluded to the services rendered to Science by the President, and then presented an illuminated address, signed by many of the leading members. Messrs. John Spiller and T. S. Davis responded to the toast of the Society; Dr. Lindsay Johnson for Scientific Applications of Photography; Mr. Payne Jennings for Art Photography; and Mr. J. Traill Taylor for the Photographic Press. Many members were absent through indisposition; but, notwithstanding this, the meeting was a highly successful one.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

W. M. Phillips, Southampton.—*Two photographs of the North German Lloyd s.s. "Eider."*

JAMES MEW.—Thanks; not at present.

G. A. G.—We do not know of such a solution.

J. ADAMSON & SON, C. WINTER.—Received with thanks.

R. M. C.—Percy Lund & Co., 21, Imperial-buildings, E.C.

R. C. D.—See our article in the ALMANAC on *Panoramic Photography.*

J. H. AINLEY.—Mr. J. Watney Wilson's address is 153, Tachbrook-street, S.W.

H. N. BUCKERIDGE.—See reply to C. J. Kirk and F. C. Beacham in last week's JOURNAL.

OPERATOR.—Apply to a firm of foreign booksellers, such as Trübner, or to Sell, of Fleet-street.

A. BADLAND.—The thing is quite practicable. Try Chadburn, of Sheffield, or Sharland, of Thavies Inn, London.

E. P. C. (Preston).—A suitable formula is: Caramel, 1 ounce; gum water, 1 ounce; methylated spirit, 1 ounce.

A. H. P. (Dublin).—We are unable to give the information desired, but a letter in English to the gentleman will serve.

OBERNETTER.—See Mr. J. Barker's formula for Gelatino-chloride Printing Out at page 786 of the ALMANAC for 1892.

J. WILLS.—The only album that we know of which fulfils your requirements is Zaenhsdorff's patent self-binding album.

JAS. EAKIN.—The *Journal of the Photographic Society of India* may be obtained of Messrs. Watkins & Osmond, 62, Ludgate-hill.

SOMERSET.—Mr. W. T. Wilkinson has published a work on the collotype process, which, we believe, is sold by Hampton, Judd, & Co., Farringdon-road, E.C.

H. B. A.—The extreme height of the building is quite immaterial; from thirteen feet the roof may be flat. At eaves eight feet six inches would be a suitable height. In line six of the previous answer the word "four" was omitted.

LUX.—Such a prism as you desire will necessarily prove expensive, provided you get it made specially. Your better way will be to build a fluid prism in accordance with the directions we gave on page 47 of the ALMANAC for 1871.

A WEEKLY SUBSCRIBER.—1. Use stiff starch, and well rub down. By keeping the mounts for some time before use the litho ink will lose its repellent character. 2. One is for looking at views, the other for reflecting them. 3. As far as is known.

F. BRYANT.—To ascertain the relative exposures required with the different stops, such as *f*-8, *f*-12, &c., square these figures, thus—64, 144, &c., and, knowing the time required for any one aperture, that for the others can be estimated proportionally.

T. R. CURTIS.—We have had no experience in tinting bromide enlargements with "aniline dyes." Some of the coal-tar colours are very fugitive, and others are more or less permanent. Standard water or oil colours are those to which our experience extends at present.

B. C.—If the metal vessel be thickly plated with gold or platinum, any, or all, photographic operations may be carried on in them. Copper vessels, plated with silver, may be used for emulsions. For ordinary operations porcelain, ebonite, or xylonite answers every requirement, and are more economising.

W. W. STEVENS.—1. The mottled markings are due to the plate not being rocked during development. 2. Yellow stains; these are caused by imperfect fixation before the plate was exposed to light. 3. Purple turbidity of the toning bath within an hour after making; contamination with foreign matter, which has reduced the gold to the metallic state. Probably a dirty vessel, or impure water.

M. K. (Leeds) sends drawings of a very complicated shutter, and asks if it, or any portions of it, have been made before, as he wishes to secure an incontestable patent for it.—On so important a matter as an "incontestable patent" we must decline to pass an opinion. Our correspondent had better place the matter in the hands of an experienced patent agent for investigation before lodging the specification.

COUNTRYMAN says: "I ordered three dozen plates from 'the stores,' and, when I received them, six out of the lot were broken, yet they were certainly carefully packed. Ought not the makers to make the loss good, as I feel certain the fault does not lie with the stores?"—Our correspondent has no claim on the makers, as he has had no dealing with them. If he has any redress, it must be from those from whom he purchased.

W. GRAHAM.—From the description of the state of the roof of the studio we should say the only effectual way of making it waterproof will be to have the whole of the old upper putty removed, and the rabbet and edge of the glass carefully painted. Then fresh putty, containing some white lead, can be applied. If the sash-bars are not sufficiently rigid to withstand a high wind, they should be strengthened by cross-bars, as any bending of them would cause the putty, when hard, to crack again.

R. W. SIMMONS writes: "There is just now a patented solution advertised that will cause gelatine films to come off the plates stretched to about double the original size. I have been using for a long time a fluid that will do this. Can the patentees prevent me using it now in my business, or restrain me from selling it, seeing I discovered it, and all my assistants knew of its power and composition, about twelve months before the patent was taken out or the advertisement published."—The patent will not prevent our correspondent from doing anything he did twelve months, or even a day, before it was applied for.

W. C. W. wants to know if a patent, the specification of which was recently published, will prevent his working a process he has had in use in his business for several years, or must he oppose the sealing of the patent at the present stage?—If our correspondent has had the process in open commercial use for years the patent, if sealed, will be invalid. There is no occasion to oppose the sealing. If the patentee were to proceed for infringement, all W. C. W. has to do is to prove prior use of the process. Probably, if the matter were brought to the knowledge of the one applying for the patent, he would abandon the application.

R. L. L. says: "Can you inform me, through the medium of your paper, what developer it is that produces a green negative? I have lately seen some very rich and luminous prints from such negatives, and was informed that they were developed with a potash developer. I have developed with the developer on p. 773 of the ALMANAC, but can only get the cold grey negative, similar in result to those developed with the carbonate of soda."—Without seeing the negatives we cannot reply definitely as to their green colour. It may, however, be that they are made on plates that yield "green fog" with the developer used. Green fog, though a defect, does not prevent excellent prints from being obtained.

PRINTER writes: "I should be greatly obliged if you could inform me through your paper the cause of such black spots as on example enclosed coming on sensitised paper, as I cannot think what is the cause of it. My system of sensitising is this: I work my bath at fifty-five grains, and float the paper from two and a half to three minutes, and then draw it up the side of the dish, so as to take as much silver off as possible, and then hang the paper over a line until dry enough to roll up. The sensitising dish is porcelain, and I also take great care in having my things clean, and never have any sweeping done, so as not to cause a dust. I have enclosed just a rough proof for your inspection."—The spots are caused by particles of something that reduces the silver in the paper to the metallic state. Whatever it is, it is not in the paper itself, as it appears to have come into contact with it either at the time or soon after sensitising, as the spot, though metallic, is only superficial.

PHOTOGRAPHIC CLUB.—February 17, *Public Exhibitions*, Mr. F. P. Cembrano, jun. 24, Monthly Lantern Meeting.

THE AFFILIATION SCHEME.—The delegates of the societies under the Photographic Society's Affiliation Scheme have held a first meeting. The rules were amended and referred to the Council.

THE MADDOX FUND.—This fund closes on March 31. Up to the present, nearly 300*l.* has been received or promised in this country. The American Fund, and the Continental Fund (which was organized at Southampton), so far exhibit considerable totals.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.—Next meeting, Tuesday, February 16, at half-past seven p.m., in Mosley-street Café, Newcastle. Subject of paper, *Platinum Toning on Matt-surface Paper*, by T. O. Mawson.

THE Richmond Camera Club's entertainment, postponed from January 15, in consequence of the death of the Duke of Clarence, will take place on Friday, February 19, at the College-hall, Richmond, at eight o'clock p.m. The invitations already issued will be available for the latter date.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—February 18, Lantern and Musical Entertainment, St. George's Hall, Champion Hotel. Tickets only. 25, Members' Open Night. March 3, *A New Enlarging Lantern without Condensers*, S. H. Fry. 10, *Collodio-bromide Emulsion*, A. Mackie.

THE *employés* of Messrs. George Mason & Co. met for a conversazione and dance in the Sauchiehall Rooms, on Wednesday evening, the 3rd instant. Thirty couples were present. Mr. Mason presided, and opened the entertainment with a short address. During the intervals songs were well sung by John Gibson, Mrs. W. W. Arthur, and Mr. Mason; readings were given in an artistic manner by J. C. Muir and J. N. Paton, and a piano and violin duet was played by Miss Mason and Mr. Thorpe Davie. The programme of twenty-two dances was concluded about two o'clock.

*** EXTREME pressure on our columns obliges us to hold over a number of articles, papers, and other communications.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1659. Vol. XXXIX.—FEBRUARY 19, 1892.

PHOTOGRAPHERS AND THE TRADE.

If it has so far failed to attract the support of the bulk of those in whose interests and for whose protection it was founded, the National Association of Professional Photographers has made good its title to existence by gathering to itself such a fund of energy and vitality as to leave little room for doubt that, in the popular phrase, it has come to stay. The annual meeting was held in London last week, and a perusal of the report, which we give in another part of the Journal, will, we are confident, convince the reader that the Association has well weathered the tempests which all new bodies have to encounter in the early part of the voyage of existence, and that its continuance and success are rendered less problematical than they appeared to be a year ago. The objects of the Association are such as to compel the approval of all well-wishers of professional photographers, and they are championed by a number of men whose earnestness and directness of purpose constitute the best auguries for their ultimate success.

The objects in question are (*a*) to watch the copyright laws in so far as they deal with photography; (*b*) to bring legitimate pressure to bear upon manufacturers, dealers, enlargers, and others, in order to secure more equitable terms for professional photographers; (*c*) to obtain from the different fire insurance companies more just and liberal terms; (*d*) to assist the profession in maintaining a remunerative scale of prices; and (*e*) to watch legal proceedings against members, and to give assistance if necessary at the discretion of the Executive. This is a business-like and not too ambitious programme, in the drafting of which the Association has exhibited a most commendable moderation and wisdom, and, at the same time, has pointedly appealed for the support of every professional photographer without exception. It would be difficult for us, to whom the true interests of the profession are, we trust, known to be of the first regard, to adduce on behalf of the Association a more forcible claim for recognition at the hands of photographers than that which that body itself has furnished.

The annual meeting was not very largely attended, and only received the scantiest attention from London photographers; but, as if to make up for these drawbacks, it appears to have been marked by much enthusiasm and perfect unanimity, and to have secured the presence of many of those midland and north-country photographers to whose courage and zeal the Association traces its initiation. We congratulate our friends on their devotion, and, if for the present we have to deplore the want of spirit and gratitude shown by their London *confrères* in abstaining from either becoming members of the Association or putting in an appearance at the annual meeting, we have no misgiving that in the future no lack of appreciation awaits their well-meant efforts. In the mean time we hope that the London men will "come out of their shells," and disperse the suspicion that they are wholly indifferent to their own interests and to those of their profession, by joining the Association.

The record of the first year's work of the Association necessarily deals largely with the details of organization and other formal matters inseparable from its position as a new society; but for all that we are glad to learn, while the members must be pleased to know, that in respect of practical achievements the record is the reverse of a barren one. We gather that the Council have under consideration the copyright laws as affecting photographers, and are collecting such data as will assist them in taking action in the matter, and thus the first of the Association's objects is receiving due attention. As regards the second of the objects specified above, we approach, perhaps, the most burning question now agitating not only the minds of the members of the Association but also of innumerable other photographers. For some time past it has been alleged that many manufacturers and dealers, and those houses that undertake enlarging and other work for the trade, have been in the habit of supplying amateurs and the general public on the same terms as professional photographers. The contention of the latter is that this is an injustice to them, and, especially in the case of enlargements, it has aroused feelings of the acutest resentment. It is not difficult to understand those feelings and to sympathise with them, when we reflect that the supplying of enlargements forms a great part of the business of photographers which will be practically taken away from them if the firms to whom they entrust the work place them on no more favourable footing than the general public. For this reason objection is also taken to the appearance of trade prices in the advertisements.

The representations on the subject which the Council of the Association have made to the trade houses have been attended with so much success that only one inference is permissible, and that is, that the grievances complained of are of a perfectly legitimate character. It is, otherwise, impossible to account for the fact that a number of firms have agreed to make a distinction between the public and photographers in regard to terms of discount, &c. Briefly put, the photographer is in the position of a trader who buys to sell again, and from that point of view the argument that he is entitled to terms which will permit of him supplying the consumer at a profit is unanswerable. He is a species of middleman, whom to discourage is to deal a blow at the growth of photography in so far as it is promoted by an assiduous cultivation of sitters' orders for enlargements and other kinds of work which is put out to the trade. It is not impossible that, by ignoring the photographer, and supplying the public with work at the lowest, and often at cutting, prices, the ultimate effect will be to deter the

professional man from undertaking such commissions at all. In this case, who would suffer in the long run? Probably the trade houses as well as the photographers, for it is difficult for us to imagine that the former could exist on the support directly received from the public. It seldom chances so in general trade; and, the spread of amateur photography notwithstanding, we fail to see that it can in photography.

This is merely the fringe of one of the questions the Association has undertaken to deal with, and in which it and photographers generally have our sympathies and good wishes. What with bad business, amateur competition, the cutting of prices, and other causes, the lot of the professional photographer is just now not an enviable one. But we refuse to believe that it is not susceptible of improvement. The establishment of the National Association of Professional Photographers is an indication that photographers themselves are alive to the same persuasion. Conceiving the objects of that Association to be of the most laudable nature, and calculated to have as beneficial an effect upon photography itself as upon those whose profession it is, we wish it every success in its endeavours, and hope that it will immediately have a large influx of new members. The Executive, with the ex-President (Mr. Whitlock, of Birmingham) at its head, have, all things considered, given the Association a very good start.

PHOTOGRAPHY IN NATURAL COLOURS UP TO DATE.

Somewhat analogous to the process of Poitevin is that which we are about to describe, and which forms the latest outcome of investigation in the domain of heliochromy. The process now more immediately before us is that of Dr. Raphael Kopp, of Lucerne, Switzerland, a gentleman who, we are sorry to say, died a few weeks since, after having protected his process by patent.

Previous to giving details we shall point out the broad lines of similarity to Poitevin's process, some account of which we published so long ago as 1865. In both, a blackened violet or subchloride of silver paper forms the medium on which the coloured picture is produced. In both, this darkened paper is sensitised by being floated upon or brushed over with a solution of bichromate of potash, sulphate of copper, and a chloride, that of Poitevin being potassium, while Kopp prefers mercury. After drying, the sheets of paper are ready for exposure. Omitting for the moment a few details, both are fixed in a weak acidulous wash, Poitevin employing chromic acid, followed by a mercury and lead salt, Kopp adopting diluted sulphuric acid.

M. Kopp's process, as described in his specification, includes the preparation of the subchloride paper to which we have made reference. He salts Rives paper by floating for two minutes on a ten per cent. solution of chloride of soda, followed, when dry, by treatment for a similar period on an eight per cent. solution of nitrate of silver. The paper, upon being removed, is again transferred to the first bath for a short time. It is then washed by being placed in water for twelve hours, when it is treated by immersion in a bath of—

Chloride of zinc	0·15 gramme.
Sulphuric acid	2 drops.
Water	150·00 grammes.

The paper, which must have the layer or coating prepared as described up to now at the top, is placed in this bath, so as to be exposed to the light, but not directly to the sun, for it is necessary that the light should be diffused. The exposure lasts until the layer or coating has obtained a greenish-blue tint. The paper must not be exposed longer to the light, as the colour would easily become too dark.

Thus prepared, and well washed and dried between blotting-paper, this paper may be kept a long time.

To render this violet-blue "silver chloride paper," prepared exactly according to the above-mentioned method, suitable for producing all the colours, including white and black, he proceeds in the following manner: A solution composed of fifteen grammes of pure potassium bichromate and fifteen grammes of purified copper sulphate dissolved in 100 grammes of water is prepared. He crushes fifteen grammes of mercurous nitrate, so as to obtain a very fine powder, which is dissolved in as small a quantity as possible of water, rendered slightly acid with nitric acid. The solution of potassium bichromate and copper sulphate is heated on an open fire until it boils, and, while the mixture is stirred, the solution of nitrate of mercury is poured in. Finally the whole is put on the side of the fire, in order that the reddish-yellow deposit or precipitate may be formed, and the solution allowed to cool. This is filtered, and made up to 100 cubic centimetres. If the filtrate amounts to more than 100 cubic centimetres, it is reduced to that volume by evaporation. This solution keeps well, and must not be strengthened.

The blue silver chloride paper is next immersed in the liquid prepared as above, and turned over for half a minute. It is then drained and placed in a three per cent. solution of zinc chloride, shaking the vessel until the said paper has again turned blue. The paper is then well washed in running water. It is pressed between blotting-paper, and placed again for six minutes in the mercury bath. On being removed from this bath, and pressed between blotting-paper, it is ready to be exposed. The paper must not be allowed to dry before it is exposed, as the exposure has to take place in the damp state.

After the exposure, which varies according to the light and the season, and which is determined by a little practice, the yellow and green portions will be already well defined upon the paper, whilst the other colours, including the white, are covered with a yellow veil. For removing this the photograph is put in a developing bath. However, before this takes place the green and yellow colours, which are visible upon the photograph and could not withstand the developing bath, must be covered with a coating of varnish. When this coating is dry, the bath cannot act upon the varnished portions, and the colours will be protected at the said portions.

After each varnishing the layer or coating is heated over a fire, in order that the varnish may spread uniformly. The photograph is not introduced into the developing bath, which consists of a two per cent. solution of sulphuric acid, until the varnishing of the yellow and green portions, and the drying of the varnish has taken place. The photograph being left in this bath, the vessel is agitated, and the yellow veil disappears. All the colours, including white, appear in all their brilliancy. It is then washed rapidly in running water, and dried between blotting-paper.

For fixing and finishing the image, after the photograph has been taken from the developing bath and washed, it is again put in the mercury bath for five minutes, and thence transferred to the developing bath until the colours, including the white, appear again. From this moment no more washing is needed, but simply pressing. Next, the photograph is coated with a solution of gum arabic containing five per cent. of sul-

phuric acid; this solution of sulphuric acid and gum must be prepared beforehand, because a precipitate is formed, and the solution must be used clear. The photograph, coated with this solution, is dried by heat and finally varnished.

We have not yet had an opportunity of trying M. Kopp's process, but we see no reason why it should not answer. The analogous process of M. Poitevin, which we did try, gave heliochromic prints, the tints of which were quite decided, although we did not altogether succeed in fixing them by the method he suggested. It is fair to assume that M. Kopp has not left this matter in doubt. In reply to any utilitarian who may ask what is the use of such a process, we quote the electrical philosopher who, in response to a similar query, asked, "What is the use of a new-born babe?" We welcome every advance, although we may fail to at once discover its value. *En passant*, we may say that ordinary chloride of silver paper, darkened by exposure to light, forms a fairly good medium on which to try heliochromic experiments.

VARNISHING CELLULOID NEGATIVES

One of the minor questions of the day is that of the best varnish for celluloid negatives, which, for various reasons, require different treatment from those on glass. The thinness and flexibility of the material render it difficult, in the first place, to apply the varnish in the ordinary way by pouring, while a film of more than ordinary toughness is desirable in order to withstand the constant risk of cracking that the natural pliability of the celluloid involves. Add to this the fact—though this is of less importance—that the celluloid itself is more or less soluble in all the usual menstrua in which the gum resins are dissolved, and the necessity for a special varnish will be apparent.

In the case of glass negatives, the protective layer requires to be, in the first place, smooth and hard, while it, at the same time, possesses sufficient toughness to enable it to resist scratching under ordinary wear and tear. For collodion negatives these are the most desirable, or rather absolutely needful, qualities, and, if combined with the less important characteristics of freedom from colour and structure, may be said to constitute a perfect varnish. But gelatine negatives, though less exacting in the matter of hardness—the gelatine film itself being so much tougher than collodion—require the quality of toughness or, perhaps more correctly, elasticity in a higher degree, owing to the extreme sensitiveness of the gelatine film to damp. In the case of a collodion film the varnish penetrates into its substance, and, when dry, forms part of it; but with gelatine it is confined to a thin layer entirely on the surface, and subject to the constant action of expansion and contraction arising from the effects of damp upon the underlying film. When the gelatine is spread upon celluloid we require, as has been shown, flexibility as well as hardness and elasticity.

So far as ordinary spirit varnishes are concerned, the necessary hardness and toughness are obtained with comparative ease, and in combination with the minor desirable qualities; but it is the qualities of elasticity and flexibility that are more difficult of attainment. For these reasons, the preparation of a varnish suitable for collodion negatives is a comparatively easy task; while, as the early workers with gelatine plates will remember, it was soon found that the new films required a new varnish, and now, again, with celluloid as the support, we find ourselves face to face with fresh requirements.

The ordinary varnishes, composed chiefly of shellac and sandarac, which form an almost perfect coating for collodion negatives on glass, require considerable modification by the addition of toughening materials to adapt them to ordinary gelatine plates; but, when these latter are again changed for celluloid films, such varnishes are utterly unfitted for use, as no amount of toughening matter, short of what will otherwise spoil the varnish, will confer the necessary elasticity or flexibility, or rob the varnish of its tendency to crack and crumble when the negatives are even slightly bent.

Perhaps the best means of toughening any of the varnishes of this type is by the addition of a certain proportion of collodion of the kind used for enamelling purposes, the quantity being dependent upon the result desired, as well as upon the nature of the varnish, and what it will allow. If it be of a suitable kind for this purpose, an equal quantity of collodion, or even more, may often be added without producing a permanent precipitate of either resin or pyroxyline; but generally a much smaller quantity is allowable. The best plan is to try the varnish by making small additions of collodion to a measured quantity, shaking well after each, should any precipitation occur, until it is redissolved, and to continue this until the precipitate becomes permanent. In this manner it is easy to ascertain the maximum proportion of collodion that will remain in solution; but it is never well to work too closely to this maximum, owing to the structural inequalities that occur in the drying of such films; in fact, it is wise to have only so much collodion as will confer a fair degree of toughness and elasticity, and no more. In cases where the varnish shows an unwillingness to take up the collodion, the addition of a small quantity of camphor will generally increase its solvent powers.

A varnish of this kind was at one time extremely popular for gelatine negatives on glass, as was also a coating of enamel collodion alone. Both these serve almost equally well for celluloid, except for the trouble of applying them. The fact that the celluloid support is itself soluble in the menstruum of the varnish is of no direct importance, since the thick film of gelatine constituting the negative intervenes between them, but it becomes an item for consideration in connexion with the method of application. Celluloid negatives, even of small size, cannot be conveniently coated by pouring the varnish on and off, as with glass plates; they are too stiff, and seldom flat enough to float, and cannot be immersed on account of the solvent and softening action of the varnish on the reverse side. Consequently nothing remains but to apply by means of a brush or similar aid; but this, again, introduces the fault of unevenness of coating; besides which, the necessity of applying heat almost precludes their use.

Some of the slow-drying turpentine varnishes have been recommended for the purpose, but they are inconvenient in use, and not otherwise altogether satisfactory. The cold, drying "crystal" varnishes, with benzol as the solvent, have also been mentioned; but these seldom dry without a certain amount of "tackiness." Amber or copal, with chloroform as the solvent, are better, but still these only overcome the necessity for using heat.

Quite recently a slow-drying varnish, consisting of celluloid dissolved in acetic ether or acetate of amyl, has been spoken of, and seems likely to answer the purpose both in the matter of toughness and flexibility, as well as in ease of application, since in consequence of its slow drying it may be applied with a brush. But we fail to see what advantage the more expensive solvent has over plain methylated spirit which readily dissolves celluloid and forms a tough, colourless, and slow-drying varnish.

We can personally recommend this plan for using up spoilt celluloid films.

But none of these methods seem to us to equal an aqueous alkaline solution of shellac—the well known "water varnish"—which has also found favour in many quarters, and is indeed, if we mistake not, an article of commerce. It has the advantage of not dissolving the celluloid support, and so permits the negative to be bodily immersed in it, and, owing to its aqueous nature, it is absorbed into the gelatine film, and forms, as it were, a part of it. The natural toughness of the gelatine then adds to the strength of the protection, and, as the varnish when once dry is impervious to moisture, the compound layer is less affected by damp, and consequently not liable to swell.

The varnish itself is very easy of preparation. To a pint of water one ounce of borax is added, and dissolved by boiling in an earthenware or enamelled iron vessel, and, when dissolved, five ounces of bleached lac are added, and the boiling continued until solution of the resin takes place. The result will be a clouded, indeed somewhat thick mixture, which, however, may be strained through linen, and then set aside for a day or two until a flocculent precipitate falls and leaves the solution clear and bright. It may be finally filtered through blotting-paper if desired.

The celluloid negative, after careful washing, should be immersed in this varnish for two or three minutes, and then hung up to drain and dry. When surface dry, it presents a beautifully even surface, the excess of varnish being absorbed into the film.

The only fault we have found with this varnish, but one that will not be felt in this connexion, is that it does not bear exposure to heat well.

COLOURED PHOTOGRAPHS.

Before continuing our observations upon this subject, we may say we have been reminded that we have forgotten to allude to albumenised paper. We have not forgotten; but the uncertainty attaching to prints upon that surface is so notorious that we did not deem it needful to allude to them. However, let it be said that, although we have such prints in our possession that are as good now as the day they were printed—a score of years ago—we yet see around us so many pictures in an opposite condition, that it may be said that all silver prints are quite beyond consideration for any but the slightest and most inexpensive tinting.

The preparation of the surface for colouring the various kinds of permanent prints is a matter of importance. Ordinary size is excellent for enabling the artist to make the colour "take." If platinotype be the basis, a still better plan by some is considered the use of aqueous solution of shellac; without this, or a good body of size, the colour will not work freely, the texture being more like that of blotting-paper. By some artists, carbon prints are rubbed with fine glass paper, or with powdered pumice; especially is this advisable for pastel work. We have seen very beautiful coloured photographs in which the head alone has been printed in by either the carbon process or platinotype, the rest of the figure being drawn by hand, first traced from the enlargement. To do such paintings successfully requires a trained artist, not a mere "stippler," and such men like drawing-paper to work upon. To fulfil their requirements is not difficult by the carbon process. It is first necessary to make a solution of gelatine and chrome alum, and paint it upon the place where the head will come upon a sheet of Whatman paper. When it is dry, the small piece of tissue can be squeegeed to the place, and development carried on as usual. It is, however, necessary to put indiarubber cloth over the tissue before squeegeeing, to prevent injuring the surface. If the paper be abraded, washes of colour cannot be laid on easily, and a spotted effect would be produced. While the developed print is still wet, it is possible, by using a camel-hair pencil, to remove any objectionable portions. The print should then be well washed, to remove the small particles of tissue, and finally placed in alum water and washed. If all this be well done, we have a head in permanent photography, and for the rest an ordinary surface of drawing-paper, the chemical processes in no way interfering with the paper so long as it is not rubbed. It should be noted that Whatman paper, when wet, is very tender and easily torn.

For both carbon and platinotype prints it is necessary to be most careful to remove every particle of the last chemical employed, as the least trace of acid or of bichromate might prove ultimately of serious danger to the stability of the colours laid upon them. In fact, in each case, a final wash of ammonia would be advisable; for platinotype it would neutralise any acid left behind, and for carbon it would greatly facilitate the removal of the last traces of bichromate which, especially in thick paper, such as Whatman's, is rather difficult of removal, even as regards what is visible to the unaided eye.

It may be well to refer to ivory, though the demand is not very great for such pictures, which, perhaps, may be one reason why its treatment should be described. It will be useless to attempt developing a carbon print by the single transfer process direct upon the ivory. The material is liable to stain, it warps under the treatment, and the peculiar quality of this beautiful but expensive basis seems to be interfered with by the necessary prolonged soaking in water and treatment with chemicals. The photographer, therefore, should first develop his print upon the flexible support prepared by the Autotype Company, and then transfer it to the ivory by means of the usual gelatine and chrome alum solution. It may be here remarked that the quality of a print on ivory cannot be properly examined without placing a piece of white paper or other white surface behind it. Otherwise, even a beautiful print will look grey and washed out.

There remain now to be discussed photographs upon opal glass. For this purpose a glass with suitable surface is very necessary. If ground too coarse, no delicacy of workmanship can be put upon it; if too fine, it will work greasy, and allow nothing but fine stippling. Some artists prefer to have the print upon plain, unroughened opal, and obtain the proper surface by a special varnish applied afterwards, which dries matt, and gives a very agreeable tooth to the brush. There are few special details to be given as to the actual preparation of "opals" for painting upon. If bromide prints or enlargements are employed, every precaution ought to be taken in removing any possibility of hypo being left behind. When carbon is the method chosen, it affords considerable facility for modifying effects by working upon the soft film with a camel-hair pencil; especially is this so with vignettes, the edges of which are then easily graduated with great delicacy, the production of a well-graduated vignette in carbon being by no means an easy matter. But particularly on opal is the use of scraper and ink-eraser suitable; large effects can be produced by it alone, portions of the print removed, and all without in any way injuring the surface for the after-treatment, the consideration of which will occupy the next article upon this subject.

Photographers' Benevolent Association.—The Annual General Meeting of the Photographers' Benevolent Association will be held at 50, Great Russell-street, W.C., on Friday, February 26, 1892, when the report and balance-sheet for 1891 will be received, and the officers for the ensuing year elected. The report says that the income of the Association is derived from the generous contributions of the few, rather than from the thriftiness of the many, and thus its benevolent, rather than its provident, character still tends year by year to become more pronounced. We are sorry the Association is not better supported by the class for whom it was started. If that class was numerous nineteen years ago, how much more so must it be to-day, when the subscriptions of members for 1891 only reached the insignificant sum of 17*l.* 18*s.* 10*d.*

Colour Photography.—According to an evening contemporary, an influential petition is shortly to be presented to the Home Secretary for the release of E. W. Parkes, formerly a solicitor in the City, who is now undergoing seven years' imprisonment for fraud. Mr. Parkes' name in connexion with photography will be remembered as being associated with the Cellarier-Parkes Syndicate, a concern floated a few years ago to produce photographs in "natural colours."

Orthochromatic Photography.—In our last issue, in reviewing a work on this subject, we quoted a formula for rendering plates sensitive, not only to the yellow and orange rays, but also to the red. Now, a little consideration on the subject will show that plates sensitised for any special ray cannot be manipulated in that light. It would, for instance, be futile to attempt to develop plates treated with eosine in such a yellow light as might be permissible with ordinary plates, eosine being the special sensitiser for the yellow. In the formula alluded to, the sensitiser for the red is cyanine, and, as yet, no better has been found for that colour. Many persons who have prepared plates with cyanine, although they have rendered the red colours of the original well, complain that they are liable to fog during the development. May not this fog be due, when it has arisen, to the light of the workroom? It is obvious that a red light cannot be employed for plates sensitive to the red rays. If a plate could be made sensitive to all the rays of the spectrum, it is clear that it would have to be manipulated in absolute darkness.

Ordnance Survey Maps.—A Select Committee of the House of Commons has been moved for, and obtained, to inquire into the present management of the Ordnance Survey, and the best method of accelerating the production and publication of correct maps of Great Britain, and to report thereon. There is no question as to the desirability of expediting the issuing of the maps. At present it frequently happens that, by the time the map is published, the entire district it is supposed to represent has completely changed; particularly is this the case with the suburbs of large towns. The ordnance map is, however, a formidable affair, and, but for photography, it would be still greater. The maps are all produced by photo-zincography, and it may be justly said that nowhere is that process worked in greater perfection than it is at Southampton. By the way, it is somewhat a matter for surprise that photo-zincography is so comparatively little worked commercially, while photo-lithography is so extensively employed.

Fading of Gelatine Prints.—This subject—one of no little importance—was brought before one of the metropolitan societies at its meeting last week. It is an incontestable fact that some prints were exhibited which had undergone a marked change since they were produced—only a few years ago. It is also a fact that other prints were shown, made at the same time and, presumably, under similar conditions, in which there was no apparent alteration. This circumstance seems to prove that the fading is not due to the process itself, but to the method of working it. If all the prints had changed alike, there might be some apparent ground for suspecting the process. We have, on several occasions, called attention to the conditions necessary to be fulfilled if gelatino-bromide, or gelatino-chloride pictures are to be considered permanent, that is, according to the general acceptance of the term as applied to photographs. More than once we have referred to the directions as to manipulations issued by some makers of gelatine papers being very incomplete with regard to the care required in the different operations. This has probably been due to the fact of the introducer of the papers wishing to make the working of the material appear as simple as possible. It would be a matter for regret if a new and valuable process should receive a condemnation which is only due to the faulty system of working it.

Deterioration of Dry Plates.—It would appear from the report of the meeting of the Photographic Society of Philadelphia, given in our last issue, that the keeping qualities of American dry plates are not superior to those of our own country. Complaints were made that, by keeping, the plates became fogged at the edges, and in time the deterioration extended all over the plates, just as the majority do here. Much of this evil was attributed to the method of packing—which is the same as that almost universally adopted here—permitting air and noxious vapours to have access to the films. It will be within the recollection of our readers that we have more than once suggested that manufacturers of dry plates should pay some attention to the paper and the boxes in which the plates are packed. If they contain any impurities of a more or less volatile nature, they certainly will have an influence on the films with changes of temperature, when the plates are packed in the usual manner with strips of paper, leaving no air space between them. We have recently been using some commercial plates, the label of which shows that they were made in 1886, that were packed face to face, with blotting-paper between them, and they are quite perfect except at the extreme edges, where the paper did not quite cover the film. Mr. Carbutt, the well-known American plate-maker, at the meeting referred to, recommended parcelling the plates in waxed paper as a preventive of fogging at the edges. There is no question that, if plates were placed film to film, with nothing between them, and then wrapped in impervious paper, such as paraffined paper, they would be effectually protected from the atmosphere or any deleterious vapours. The only objection to this system of packing would be the danger of the films rubbing against one another. This, however, might be avoided by securing each pair of plates together by strips of gum paper at the sides. This method of packing is certainly worthy of trial with plates that have to be kept a long time before use or for export to hot climates.

DEATH OF MR. EDWIN COCKING.

We are sorry to learn of the death of Mr. E. Cocking, an event which occurred on Friday last, when he was suddenly seized with a fit of apoplexy, from which he never rallied. Mr. Cocking has been before the photographic public for a long course of years. In 1867 he became Hon. Secretary of the original South London Society, and contributed various papers, mainly having reference to the art aspect of the science. It is well known that Mr. Cocking, up till a recent period, was Assistant Secretary of the Photographic Society of Great Britain, a position he occupied for fifteen years, and every one connected with that body can bear testimony to the efficiency of his services during its annual exhibitions. He was educated at South Kensington as an artist, and was a frequent and, indeed, regular contributor to our pages and those of our ALMANAC, his last article being that on page 647 of the current ALMANAC, *Figure Studies in Photography*. Mr. Cocking was an affable and well-informed man, but had long been suffering from an increasing deafness, which incapacitated him from undertaking public duties, although he was entirely cured towards the close of last year. We are sure that our feelings of sorrow at Mr. Cocking's death will be shared by the large circle of friends he made during his long career in photography. He leaves behind him a record of unobtrusive usefulness which will long live in their recollections.

GRINDING THE EDGES OF PLATES.—II.

For a grinding slab for glass proceed as follows:—Take a piece of wood—it matters not what kind—of suitable size and plane it perfectly smooth, and as nearly flat as possible. My own slab consists of a piece of ordinary "flooring board" seven inches wide by a foot long. Having produced a clean, smooth surface, hold the board to the fire or place it in the oven until it is thoroughly warm, or as hot as the hand will bear, then brush over it an even coating of *thin* glue, free from lumps or inequalities. The wood may be allowed to absorb as much as it will of this first coating as a "priming," but it must be renewed before applying the emery. It is important that the glue should be thin, and thinly and evenly applied, and if freshly made so much the better. Take glue of the ordinary strength for carpenter's use and dilute it with an equal quantity of water and then to ensure an even coating, filter it.

Having spread this evenly, as described, over the surface of the wood, proceed to sprinkle or sift a plentiful supply of emery on to it, and extend this evenly by means of a sharp, side-long, shaking motion. When the surface seems evenly covered, throw off the surplus on to a sheet of paper, and tap the board sharply on the table to remove all emery that is not actually adhering to the glue; examine closely for bright, thin patches, where insufficient emery has clung, and if there be such sprinkle a little more on those places. It it still refuse to stick, it is because the glue has set too quickly. It must then be gently warmed, and the emery reapplied over the whole surface, as at first. When an even coating has been obtained, set it aside to dry, and when dry, or nearly so, brush it over quickly with another coating of glue, and reapply the emery as before, and this, when dry, may be followed by a third application, which will complete it.

It is of considerable importance what grade of emery to employ for different purposes. For simply grinding the edges of glass the coarsest that can be obtained may be used, say No. 30, or if No. 24 is obtainable so much the better. But a closer and much more durable surface is produced by laying a foundation of the coarser grain, and following that, when quite dry, with a second coating of No. 60. This seems to cut with the freedom of the coarse grain, and the smoothness of the finer. For fine grinding, or semi-polishing, the last coating should be "flour" emery.

The points to be observed are to have a perfectly even and thin layer of glue, and to keep it in sufficiently liquid condition to take thorough hold of the emery. This is the object of heating the wood, and of allowing its pores to fill themselves with glue before applying the emery. If this be not attended to the powder will rub off when dry, or come off in scales, from the want of adhesion of the glue to the wood. Then the drying must be carried far enough between the different applications to prevent the second coat of glue from moving the first. Perfect desiccation is to be preferred where time permits, as it adds very greatly to the durability of the coating. Heat should not be used in drying, or the glue will blister, and subsequently scale off.

Such a slab as that described I use constantly when cutting plates in the dark room, or when I find they need it. The plate is held at an angle of forty-five degress, and each of the eight edges is passed lightly, but firmly over the slab, at a slight angle with the direction of the edge. Heavy pressure is needless, and only tends to cause "chips," though there is no serious danger of this with a properly prepared slab. The plates must of, course, be dusted with a camel-hair brush before placing in the slides.

It is not possible to do much in the way of grinding the edges of the unexposed plates, nor is it desirable to attempt it; but, after the completion of the negative, it will well repay the operator to remove any inequalities of a serious character that may have been left by the cutter. This is easily and quickly done on the emery slab without the slightest risk to the negative, and much to the advantage of the digits of the printer.

Where the means are available for utilising the services of an emery wheel made on this principle, it will be found useful for a variety of purposes besides tool grinding, as, for instance, in grinding and polishing glass, cutting shapes of either straight or curved outline, or, in skilful hands, glass bevelling. Indeed, I have found these wheels one of the most useful additions to my workshop, as with ordinary care if kept dry—which is important—they last for months without renewing, and when worn to a "glaze" only require regluing and dusting. In fact, the older they become the better they are, on account of the greater homogeneity of the foundation. Should the surface by any accident become chipped or scaled, as from too heavy pressure of a point tool in grinding, or from damp, the whole of the emery may be removed and saved by soaking first in cold and then in hot water, when the wooden foundation is in a condition for re-coating.

W. B. Bolton.

ART AND GENERAL NOTES.

Photo-Mechanical Exhibition.—At the Museum of Fine Arts, Boston, U.S.A., there is just now a collection of examples, illustrating the technical methods of art reproduction with reference to photo-mechanical printing processes, and their development, for producing printable blocks and plates. Such an exhibition in London would, we are sure, be welcomed by many.

An Artist's Charity.—A novel way of increasing subscriptions at charity dinners is to be adopted by Mr. David Law, the etcher, who has undertaken, at the Artists' Benevolent Institution dinner in May next, to present a signed proof of an etching to all subscribers of a guinea and upwards on the Fine Art Society's list. The etched plate is to be destroyed after the dinner. Here is a hint for the Photographers' Benevolent Association, when it is in need of funds. Hold a dinner, and give signed prints from a negative, say, by Dr. Emerson, to all subscribers of so much, and then destroy the negative.

The Woodcuts of Gothic Books.—At the Society of Arts recently, Mr. William Morris, the poet, read a paper on this subject, in the course of which he said, "All organic art, all art that is genuinely growing, opposed to rhetorical, retrospective, or academical art, art which has no real growth in it, has two qualities in common—the epical and the ornamental; its two functions are the telling of a story and the adornment of a space or tangible object." There is much in this that applies not remotely to photography. Mr. Morris's examples were illustrated by means of the optical lantern, and the lecture was a learned criticism of ancient and modern methods of book-illustrating.

Art at the Proposed Photographic Institute.—We agree with Mr. P. H. Newman who, apropos of some remarks on this subject which appeared in our leader last week suggests that, as we say, every one has his own pet idea on the subject of art in relation to photography, many must of necessity be wrong. But granting this and also his deduction that the greater the reason for art being included in a projected curriculum, we not only feel that the subject would be outside the scope of a technological institute, but we are also in considerable doubt as to whom we should look to for the office of putting the many that are wrong right. What *is* right?

Photography at Chandernagore.—All the way from Chandernagore, we lately received a letter from Mr. Bankinchandra Mukerji, the honorary secretary of the Amateur Photographers' Union. Accompanying the letter were several cards embodying good wishes. They were highly coloured representations of the goddess Sacti (Power) under the different forms assumed by her on different occasions. The letter also contained a photograph of the chief Hindu goddess, Durga, taken by a beginner, whose reward, it appears, is the satisfaction of getting a specimen of his photography to England. The Amateur Photographers' Union of Chandernagore only possesses two cameras. Its members seldom see the photographic papers, and they "stare with mute wonder when they read some of the marvels in them when chance takes them a copy." They lament the absence of somebody competent to instruct them in the various manipulations described! The excellent picture of the Hindu goddess above referred to convinces us that this is pure satire—if not sarcasm.

THE PHOTOGRAPHIC SOCIETY'S LECTURES.—III.

PHOTOGRAPHY AS A BRANCH OF TECHNOLOGY.*

A Branch of Technology of the First Order.

The True Cause of Technical Education Threatened.

The danger ahead which threatens the true cause of technical education appears to me to be this: The resources of the country are being too much frittered away in the multiplication of machinery for imparting elementary instruction, and the higher specialisation, which alone will save us in the end, is being crippled thereby. The elementary groundwork must be laid, and this work, as far as it is being done, cannot be done too well. But it is absurd to suppose that we shall recover our lost position in any branch of industry by scattering broadcast a knowledge of elementary science, and there leaving matters to stand. A technologist is nothing—at least in any of the subjects with which I have had connexion—unless he has the means of superadding more advanced specialisation to his general grounding. So far as the chemical industries of this country are concerned, a few highly trained specialists are worth more than an entire army of elementary certificated teachers or prize-winners. We are expending so much energy over our foundations, that there is but little left for raising the superstructure. We are arming our industrial fighters with weapons which are as pop-guns compared with the heavy ordnance of our competitors. Unless those who are responsible can be made to see that the elementary training in general principles is, in a large number of subjects, quite useless, unless the higher specialisation is equally well catered for, we shall be no better off in these branches of technology than we were before. The elementary training bears to technology the same relationship that the tuning of the instruments does to the overture. There is a great deal of twanging and blowing going on all over the country, but, as yet, comparatively few indications of a finished performance. There is enough money in the hands of the County Councils at the present time to support technical institutes adapted to local requirements on a scale which would bear comparison with the polytechnics and technical high schools of the Continent. If each county, or group of counties, had its central technical institute, manned by competent specialists, then the elementary training might bear real fruit, and we should look forward with greater hope to the result of the campaign on which we have entered. It is not difficult to see how the fight will end if we persist in blazing away with this elementary small shot in response to the ponderous missiles of our industrial competitors.

Out of the haze of generalities which I am afraid I have been led to inflict upon you, the central idea concerning the proposed action of this Society I hope begins to loom with a more or less definite form. It is not for you to add to the general tinkling of small bells, but it remains for you to bring together a strong staff of expert ringers who can give us a good loud peal on the chimes. You will, I hope, sooner or later, set an example in technical education in your own subject—which so admirably lends itself to the purpose—which shall act indirectly on all related subjects, by showing how much of the real work of technology begins after the elementary and advanced training have been completed. The instruction imparted under the existing arrangements is good as far as it goes, but from your point of view it must be regarded as the means of supplying the raw materials out of which the technologist of the future is to be moulded. It is not your province to assist in multiplication of the elementary classes, but to set the seal of efficiency on the existing organizations.

A Splendid Opportunity before the Institute.

I should have but little justification for addressing you as I have, did I not feel what a splendid opportunity lies before you for raising the level of at least one important branch of technology. Still less should I be justified in responding to your invitation did I not offer some suggestions which may be of use in furthering your object. The Photographic Institute, such as we desire, would be an establishment thoroughly equipped for the best practical instruction, well provided with appliances for carrying on research in every department of the subject, and having attached to it the most competent specialists in every branch. The staff need not be numerous at first; a chemist, an optician and physicist, an expert in photo-mechanical processes, and an artist would represent the chief departments. Your committee or governing body would know the right men to select; if they cannot be found in this country, you may have to go abroad for them. This course may appear ignominious; but, if it has to be adopted, so much the better, it will bear practical witness to the necessity of having the means of raising such men in our own country. The ideal institute may be a slow growth, but every effort should be made to establish it. The Photographic Society has already taken the initiative by proposing an affiliation with kindred Societies.

Concluded from page 108.

This scheme should be energetically pushed forward, and every means adopted for urging the importance of the claims of photography to have a recognised technological centre. I venture to think that an impetus would be given to the movement if representatives of the Camera Club, the Photographic Convention of the United Kingdom, and of the numerous photographic Societies of the metropolis were invited to another conference, such as was held last year, but with the special object of forming a joint committee, under whose authority a further appeal might be made for public and private support. If only a moderate fund could be raised at first, operations might be commenced. Surely the numerous firms which have come into existence through the general introduction of photographic processes, and the large body of wealthy amateurs who practise the art as a pastime, might be sufficiently interested in the movement to give it their support.

It only remains now to bring these suggestions to a practical issue. We are such a very practical nation that, unless something tangible is offered, the foundation of the Institute may be indefinitely delayed; as yet, there is nothing of the kind in existence—there is no organized work being done that appeals directly to the patriotism and to the pockets of those to whom you may legitimately look for assistance. But elementary photography is being taught in connexion with technical schools and classes all over the country. A good beginning might be made if under the auspices of the joint committee a few first-class specialists were enlisted and authorised to give short courses of demonstrations to those affiliated societies, or in those centres which desired to receive such instruction. The local centres might fairly be asked to make the necessary arrangements and to bear the small expense of local organization; the fund raised by the joint committee would be well spent at first in defraying the costs of a few special lecturers. You may have some difficulty in laying your hands on the right men for this work; I need hardly remind you that the whole success of this initial movement depends upon your sending only the most highly qualified specialists. You must have men who can teach the teachers, and convince practical photographers that underlying the practice of their art are broad scientific principles, which it is their interest to know something about. These preliminary peripatetic courses must be regarded in the light of missionary efforts, having for their object not the multiplication of photographic operators, but the awakening of the elementary and advanced student to the higher aspects of their subject. It is desirable to have this function of the lecturers well understood at the outset; the experts who are entrusted with this work will know well enough that it is impossible to make a technologist out of a student, however enthusiastic he may be in his subject, simply by giving him a course of lectures.

The Institutes of Berlin and Vienna.

If the system of itinerant instruction which I have suggested can only be fairly started, even on a small scale, one important function of the Institute will have been inaugurated. It will have a claim upon the practical educationalist as a teaching body; it will appeal more specifically to the promoters of technical education, and to those public bodies which have voluntarily or by Act of Parliament identified themselves with this movement. It is certainly discouraging—I may say discreditable—when we see the magnificent scale on which the photo-technical institutes of Berlin and Vienna have been founded and equipped, that in this country, whatever the importance of the subject, public recognition and support come only after success has been achieved by private enterprise. I am afraid you will have to reckon with this national characteristic, which, although retarding advancement in many directions, is so far good that it calls forth the most strenuous exertions to ensure success at the outset of every new movement. Upon the success of your first small undertaking will depend the larger ultimate success which we all look for.

One other suggestion occurs to me which may help to strengthen your hands. I have said that instruction in photography is already being in many technical schools; this instruction is more or less of an elementary character. It seems feasible to combine with the proposed courses of special lectures a system of inspectorship which might be carried out by the same staff. Your lecturers would be recognised experts, capable of advising such schools as to methods of teaching and of co-operating with local centres in the selection of the most highly qualified teachers. I am sure that most centres would be only too glad to avail themselves of the knowledge and experience thus placed at their service. If you begin operations on these lines at first—if you can carry on this combined system of skilled teaching and inspection successfully for a few years, your claim for permanent establishment and endowment as a Photographic Institute cannot but receive that support from public bodies to which your educational efforts will have entitled you, and which in other countries is given by the State.

Raphael Meldola, F.R.S.

ELEMENTARY NOTES ON PHOTOGRAPHIC LENSES.

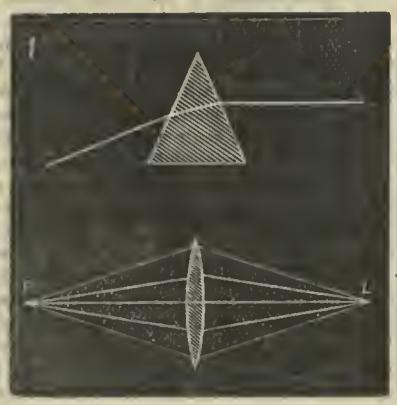
[A Communication to the Polytechnic Photographic Society.]

An essential qualification in a skilled workman is that he should thoroughly understand his tools, and be so well acquainted with the capabilities and characteristic or distinctive qualities of each one that, whatever work he may be engaged upon, he will instinctively select the most suitable for producing the desired result.

It is not intended to ask your attention to an abstract or advanced technical essay, but rather to a consideration of those elementary principles and facts relative to the construction and action of photographic lenses, and their bearing on practical work, that should be familiar to every photographer. The lens being his principal tool, a more perfect knowledge of its powers and properties is of the highest importance.

Refraction.

It is a familiar fact that the direction of a ray of light is changed or bent by passing through a prism, this bending being called *refraction*, as shown in diagram 1. Now, if a piece of glass, having its surfaces ground to form



parts of a sphere, be substituted for the prism, as in the lower figure in the diagram, it will be seen that its action is similar to an infinite number of prisms, all points at the same distance from the axis refracting the rays to the same extent, and all other points refracting to an extent proportionate to their distance from the centre, so that all rays from the same source of light, L, are refracted, and meet at a point on the opposite side of the lens, P, this point being called the *focus* for that ray.

In all diagrams of principles, the lens is drawn very large, to render the illustration plainer. It will be seen from this that each point in the image is the apex of a cone of rays, the base of the cone being the working diameter of the lens; and a lens is capable of transmitting an infinite number of such cones of light, and bringing each to its own focus independently of the others, each preserving its own character, direction, intensity, and individuality intact.

The amount of refraction is determined by the curves of the lens; consequently, the greater the angle at which the rays enter, the more acute will be that as they leave, so that, the greater the distance of an object the nearer the lens will the image of that object be formed.

In Diagram 2 an object at O^1 has its image at F^1; while one at O^2, nearer the lens, projects an image at F^2, farther away.

Foci of Lenses.

When the focus of a lens is given, it is always the focus for parallel rays or those proceeding from an object at a very great distance, this being the nearest plane to its surface at which a lens is capable of forming an image. This is generally called the equivalent focus, and, being known, the distance at which nearer objects are sharply defined is easily found.

If F = equivalent focus;
D = distance of object from lens;
I = focus of that object or distance of image from lens;

$$I = \frac{F\,D}{D - F}.$$

Example: Focus of lens, 10 inches; distance of object, 90 inches.

$$I = \frac{10 \times 90}{90 - 10} = \frac{900}{80} = 11\tfrac{1}{4} \text{ inches.}$$

When an object to be photographed is placed at a distance from the lens equal to twice its equivalent focus, the image is formed at exactly the same distance, and is the same size as the object. This gives a simple method of ascertaining the focus of a lens, the only drawback being the necessity for a camera that will extend to nearly twice the length necessary for ordinary work with the same lens. Adjust the camera until the image is the same size as the object itself; measure the distance from the ground glass to the object, *one-fourth* of which is the equivalent focus of the lens.

When the camera will not extend sufficiently for this, the same principle may be applied, though the method is rather more complex. Focus and measure any convenient object, arranging so that the image is a certain proportion of the size of the original, and carefully measure the distance from the ground glass to the object.

F = equivalent focus;
D = distance of object from focussing screen;
R = ratio of size of image to object:

$$F = D \div \frac{(R + 1)^2}{R}.$$

Example: An object is focussed, and the image is one-eighth full size, the distance between the image and the ground glass being 101¼ inches. By working out as shown on the board, the focus of the lens is found to be 10 inches.

$$F = 101\tfrac{1}{4} \div \frac{(8 + 1)^2}{8} = 101\tfrac{1}{4} \div \frac{81}{8} = 10 \text{ inches.}$$

As so much in the intelligent use of a lens depends on knowing its focus, a photographer should carefully measure each one in his possession. For those who prefer the most simple methods possible, a roughly approximate result may be obtained by focussing a distant object, and then measuring from the ground glass to the lens itself if a a single, and to the stop-slot if a double, combination.

The size of the image of an object at a given distance is approximately proportionate to the focus of the lens used; a lens of ten inches focus will give an image about twice as large as one whose focal length is *five* inches.

The distance beyond the equivalent focus that the ground glass has to be extended to produce a sharp image of any given object is a fraction of the focus expressed by one figure less than the multiple of the focus that represents the distance of the object. For example, if a sitter were placed thirteen feet in front of a twelve-inch focus lens, this, being thirteen times the focus, would necessitate the ground glass being extended one-twelfth of twelve inches—*i.e.*, one inch beyond its position for distant objects—while the same distance from a six-inch lens, being twenty-six times the focus, would require one-twenty-fifth of six inches, or rather less than a quarter of an inch extension, the scale of the images being one-twelfth and one-twenty-fifth full size respectively.

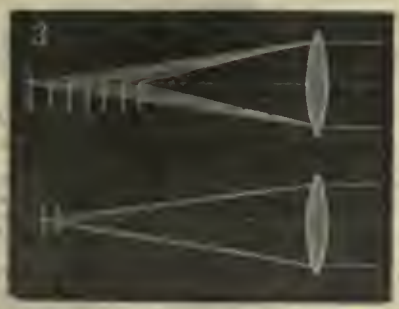
The extent to which any object is out of focus when another is sharply defined increases as the square of the focus of the lens, the example just given showing that for the same object a twelve-inch lens required four times the extension beyond the equivalent focus that the six-inch lens necessitated.

This will illustrate the limited practicability of *fixed focus lenses;* by which is meant those that, without any extension of the ground glass, will define, far and near, objects sharply, which is, theoretically, an impossibility; but, when lenses of very short focus are used for subjects at a moderate distance (this is such a large multiple of the focus) that the corresponding fraction is such a very small quantity, that, the lens being carefully focussed for an average distance, all other objects likely to be included in "snap shots," will be sufficiently sharp for practical purposes.

Dispersion.

A ray of light, passing through a prism or a lens composed of a single piece of glass, is not only refracted, but also *dispersed*, or divided up into its elementary colours, each colour ray being brought to a focus at a different point, and in the following order from the lens:—red, orange, yellow, green, blue, indigo, violet, as shown in diagram 3. For rendering the illustration clear, the distance between the extreme points is greatly exaggerated, and would be more correctly represented by the lower figure.

The rays to which our eyes are most sensitive are the yellow, which have very little effect on an ordinary photographic plate, this being considerably more sensitive to the blue than to any other; so that, if an image formed by such a lens were sharply focussed in the ordinary way, and a sensitive plate exposed, the resulting negative would be blurred or out of focus, owing to the chemically active image being situated at a



different plane from the greatest visible sharpness. Different kinds of glass do not *refract* and *disperse* to the same extent, so that, by a skilful optician combining two pieces of sufficiently varied refractive and dispersive powers, the action of one is corrected by the other, and the chemical and visible images are made to coincide, and such a lens is said to be *achromatic*, or free from colour dispersion.

This combination to form one lens must not be confused with a double or compound lens, having one element at each end of a tube. The two glasses are cemented together in optical contact, as in diagram 4, and to an ordinary observer appear to be one piece only. A single lens is such a cemented combination, while most compound lenses consist of two similar elements mounted at the opposite ends of a tube.

A simple or non-achromatic lens is capable of forming a photographic or chemical image if suitably focussed. When the greatest sharpness is obtained on the ground glass, it should be moved slightly nearer the lens, the exact distance being one-fourteenth of the focus.

H. W. Bennett.

(To be continued.)

CARBON PRINTING.

[A paper read before the Birmingham Photographic Society.]

I do not propose to occupy your attention this evening with any long description of carbon printing, but rather to proceed as soon as possible to the *practical* part of the matter, because I am aware that you have carbon experts as members of your Society, and have not long since had a demonstration on this subject; but I think there may be some possible differences in treatment and method, and that my method of working on smoothed opal glass may be a portion of this subject new to you.

I fear it may be thought an old story, and to some extent an obsolete process, for producing photographic printing, and it is older in point of date than the platinotype, bromide, or gelatino-chloride processes, but I think it can hold its own with any process in existance in the important points of delicacy and gradation of tone, and especially as regards the richness and transparency of the shadows.

On this particular point I think carbon surpasses all other processes. You know that it is easy to bring the delicate detail of the darker shadow, and in a dense deposit, when printing in bromide or platinum, but the peculiarity of the carbon printing is that, no matter how deep the shadows may be, if there is fair detail in the negatives it will show in the prints, because the shadows consist of varying thicknesses of gelatine tissue, and there is always atmosphere and transparency in them.

I would call your attention for a few minutes to the more conspicuous points of the process as regards its advantages and disadvantages, compared with other known processes, and I take it for granted that you all know the *rationale* of working in carbon tissue.

Advantages of the Process.

I have known the working principle of the process for many years past, but I always had an idea that it was a dirty, messy, sloppy process, which required an unlimited supply of hot water, and I purposely neglected it, because I could not see my way to make any provision of such supply. But, after trying pretty well all the known printing methods, and being dissatisfied with most on account of the want of permanency of some, and the difficulties attendant on the imperfect working of others, I resolved at last to see the carbon process as worked by the Autotype Company of London, and the simplicity of it was so striking that I at once took it up, and I think it combines most of the good points one desires in a photograph, and avoids the disagreeable after-work of long washing and soaking of prints to eliminate any salts left by fixing agents.

The advantages of carbon are, first, permanency. There cannot be any doubt on this point, if care is used in adding pigments of undoubted permanence to the gelatine tissue, and there are so many absolutely reliable pigments available that we may dismiss all anxiety on that point. The film of gelatine in which the colouring matter is suspended is not only rendered insoluble in very hot water by the action of light, but is afterwards subjected to the tanning action of alum, so that it may be considered to be doubly treated in a way to render it permanent, as a means of enclosing and preserving the colouring matter which forms the picture.

Secondly, there is no need for any inspection of the print during exposure in the printing frame. The time is ascertained by an actinometer, consisting of a strip of sensitised silver albumenised paper compared with a tinted ground, and therefore there is no risk of fogging the print by repeated examinations of its progress in a weak light. This may possibly be thought an objection and a source of difficulty; but, though it requires the experience of a first print from each new negative to determine the correct actinometer exposure, when it is once determined and a memorandum made of it, all future printing from that negative becomes a certainty, and you may produce without mistake any number of after-prints so long as you work accurately by the actinometer.

I always expect to have only an approximately correct print from the first piece of tissue exposed on any new negative, as no one can tell by examination what the vagaries of every negative may be the first time of using; it may require longer or shorter exposure and more "blocking out" of certain parts than at first sight might be expected. Therefore I put it down as one of the disadvantages of the process that the first print from a new negative must be regarded as a tentative proceeding, and the subsequent prints from such negative must be guided by the experience gained from the first trial.

As soon as I know the correct actinometer exposure, I write it on the back of the negative in the clear rebate margin with a writing diamond, and it is always at hand for reference, and it may be relied on as an unfailing guide for future work.

Thirdly, comfort and convenience in working. All who have printed by bromide or alpha paper will have felt the discomfort of having to work in a red or orange light, and the difficulty of estimating the exact pitch to which development has arrived, and the correct time to stop; but in carbon work it is widely different, the tissue, when moistened for development, becomes comparatively insensitive to light, and it is possible to work in a fairly good diffused daylight, or by a very strong gaslight, without risk of fogging the image, and it is an immense comfort and convenience in judging of the critical state of the print to be able to use a strong light and see so perfectly what one is doing.

Fourthly, convenience in obtaining materials. The tissue can be had freshly sensitised twice a week from the Autotype Company, and travels well by parcel post sent out in cut pieces of the exact size required for any negative, and it is ready for use at once, or you can have it sent in rolls, and cut it up yourself; but in this state I find there is some danger of cracking the face of the film in unrolling it ready for cutting up, and the system of cut pieces is most convenient.

Some Disadvantages.

The chief drawback to carbon tissue is that after sensitising it will only keep in good working condition for a short time, say, about twelve or fourteen days, if kept in a dry condition, so that it is advisable to use it up as promptly as possible, or to order only as much at one time as can be used up with any series of negatives within a fortnight; but it is just here that the convenience of obtaining it in cut pieces twice a week comes in, as the postage is light on it.

I have some experiments now in progress by which I hope to find that it may be kept longer, if not indefinitely. It has been stated that gelatine, when sensitised by bichromate salts, becomes insoluble in course of time only in the presence of moisture; and it would seem feasible that, if all moisture is extracted by storage in a chloride of calcium tube, such as is used for a platinum paper, it might be expected to remain in good printing condition as long as dryness is maintained. If so, it will be a great convenience to be able to keep tissue longer; if not, we shall be in no worse position than at present.

Of course, such desiccated tissue must be allowed to absorb moisture to a normal extent by being placed in a dark and damp cellar for a short time before use in the printing frames; and, as it is very hygroscopic, it will rapidly absorb sufficient moisture.

The only disadvantage of a serious nature in carbon printing I am aware of is the action of the skin of the solution of bichromate, which has a known poisonous property if too long in contact with the hands. The warm water necessary for the solution of the gelatine in development renders the skin very absorbent, and the salt, after a time, creates considerable irritation, resembling 'chapped hands' due to cold weather, and in aggravating cases it strongly resembles 'eczema,' with great itching and smarting of any cracked portions of the skin. On questioning the *employés* of the Autotype Company on this point, I found considerable variation; some in constant use of the tissue were not affected by it,

others were attacked in the way indicated; it appears to be partly constitutional tendency to it or otherwise. In my own case, I worked the process for nearly a month before I found any inconvenience; then the irritation commenced, and I had to leave off for a time, and by the use of vaseline pomade it soon ceased; I then adopted stout indiarubber gloves for use in development, and have not had the least trouble since—in fact, the use of indiarubber gloves is pleasant and beneficial, as they act like a Turkish bath, and keep the hands in nice order, if washed in soap and water after work. I therefore strongly advise any one who takes up carbon printing to avoid the unpleasant consequences of contact with bichromate solutions, by the use of indiarubber gloves.

GEORGE BANKART.

(To be continued.)

NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

THE first annual meeting of this Association was held at Anderton's Hotel on Thursday, February 11, the President, Mr. H. J. Whitlock, in the chair.—The attendance, if not large, was representative, members from Leeds, Sheffield, Hull, Birmingham, Manchester, Lincoln, London, and other large towns, being present.

The PRESIDENT, in opening the proceedings, gave a history of the Association since its inception, and said that throughout there had been great unanimity among the country photographers. They had now come to London to hold out the right hand of fellowship to the London photographers, among whom, he had been told, some jealousy existed. Whether they succeeded or not in their endeavours, they would have the satisfaction of knowing that they had approached them in a spirit of cordiality. They had had difficulties to encounter, but they had met with considerable success and encouragement. A list of photographers of the United Kingdom, numbering about 3000, had been compiled, who he hoped would join the Association. One great cause of complaint by photographers was that some firms who did a great deal of enlarging for the trade gave them no better terms than to those outside the profession, who were not dependent upon their business for a living. This was a most unfair action, as it practically took a large part of the business out of the profession which had been accustomed to have it. Some firms, however, had seen the injustice of this, and had undertaken to protect the profession in the future by allowing them a substantial discount. He looked to the members of this Association to support those firms who acted justly to them. He would go further, and say that one way of bringing it home to themselves was to bear in mind that they were not studying their best interests in supporting other houses who declined to act fairly with the legitimate photographer.

The report of the Council, after acknowledging the indebtedness of the Association to Messrs. C. P. Richards and Crosby for their efforts, stated that the subject of enlarging for the trade had received attention. In reference to the law of copyright, it was intended to prepare data on the subject, and the profession would be invited to forward suggestions on the subject. The following firms had complied with the wishes of the Association as to allowing trade prices to traders only:—Messrs. Elliott & Son, Marion & Co., the Autotype Company, the Eastman Company, Edwards & Co., Fry Manufacturing Company, Brooke Brookes, Slater & Co., the Birmingham Photographic Company, and others.

The adoption of the report was moved by Mr. THOMAS FALL and seconded by Mr. G. V. YATES (Sheffield), and it was agreed that, together with a list of members, it should be printed for circulation.

Mr. JAMES MARTIN hoped the Association would not depart from the principles of free trade, and complained of the action of those who advertised enlargements in the journals at very low prices, which were read by the whole photographic world as well as amateurs.

Mr. FALL said it was the firms in a large way of business that the Association had to fight against, and so far they had been very successful. Catalogues and advertisements had, in some instances, been withdrawn, and new lists sent out. There was no attempt at protection or coercion on their part, they were simply acting on the defensive, and he was ashamed of the apathy of the London photographer.

Mr. MARTIN hoped that when the Association got more fully established, the labours of the provincial photographers would be gratefully recognised by all those who benefited from them. He himself had adopted one list of prices, as suggested by Mr. Fall.

Mr. JOHN CROSBY was somewhat disappointed at the thin attendance, and regretted the London photographers had not accepted the invitation to be present in the spirit with which it was given. This question was one of bread and butter for them. The price lists of large firms not only got in the hands of amateurs, but also in those of the general public, who got their enlargements at the same price as photographers. He advised members of the Association to boycott the firms that did not use them fairly.

Mr. MARTIN spoke of the "dreadful facility of the pressure frame" as a factor in the cutting of prices, large firms sometimes finding competitors in their former errand boys. There was a large Association of amateurs the members of which expected printing done on trade terms not only for themselves, but also for their sisters, cousins, and aunts. They also got their enlargements done at twenty-five per cent. less than trade prices. These orders should go through the professional photographers. Amateurs became fully informed of trade terms from the advertisements which appear in the journals.

Mr. FALL thought they had less to complain of the amateurs than of the general public, assisted by the large firms. After quoting instances where such firms had allowed the same terms to the public as well as to the photographers, he said he wished it to be understood by photographers that great benefits had accrued from the work of the Association, which had received communications from several firms expressive of their determination to behave better in the future.

Mr. T. K. BIDDLE thought the Association should deal with the free crayon dodge, which was a direct fraud on the public.

Mr. FALL said the subject had been introduced at one of the Council meetings, and it was felt that the police-courts would be better able to deal with it. It was working its own cure, as they had now nearly gone all over the kingdom, and photographers were not suffering.

A guarantee fund of 76*l.* was announced. The following were elected to form the Council for the ensuing year:—*President:* Mr. T. Fall, London.—*Vice-Presidents:* Messrs. Chevalier Lafosse, Manchester; Robert Slingsby, Lincoln; H. J. Whitlock, Birmingham.—*Council:* Messrs. W. Barry, Hull; T. Birtles, Warrington; — Bromage, Bridgnorth; Warwick Brookes, Manchester; W. J. Byrne, Richmond; J. Chancellor, Dublin; W. Cobb, Tottenham; T. Storey Davis, Halifax; W. E. Debenham, London; J. E. Eddison, Barnsley; J. Elliott, Elliott & Fry, London; J. Fergus, Largs; T. Forrest, Pontypool; — Guy, Cork; William Gill, Colchester; R. P. Gregson, Blackburn; Abel Lewis, Clifton; Donald MacIver, Leeds; James Martin, New Southgate; H. S. Mendelssohn, London; W. H. Midwinter, Bristol; John Moffatt, Edinburgh; C. Pettinghall, Liverpool; Frank M. Sutcliffe, Whitby; Carl Vandyke, London; H. Van der Weyde, London; F. M. Whaley, Doncaster; G. V. Yates, Sheffield.—*Hon. Treasurer:* Mr. John Crosby, Rotherham.—*Hon. Secretary:* Mr. C. P. Richards, Barrow.—*Secretary:* Mr. D. J. O'Neill, 47, Charlotte-road, Birmingham.

Mr. FALL proposed a vote of thanks to the retiring President, Mr. Whitlock, for his services to the Association. This was seconded by Mr. CROSBY, who testified to the deep interest which Mr. Whitlock took in the Association. Mr. WHITLOCK briefly replied, and the proceedings terminated.

Our Editorial Table.

MESSRS. MARION'S catalogue of photographic material and apparatus contains illustrated particulars and prices of all the requirements of amateur photographers. The preface gives some good advice to amateurs in reference to the selection of apparatus.

MESSRS. PERCY LUND & Co. have compiled an index to current photographic literature, which, if not exactly "supplying a long-felt want," is handy for reference. Its usefulness, however, is impaired by several omissions, a defect which, we gather, will be remedied in future editions.

BURTON'S MODERN PHOTOGRAPHY (Piper & Carter, 5, Furnival-street, E.C.) has reached its tenth edition. Several alterations, that were received from the author too late for adoption in the previous edition, are included in this. The work, as we have before said, is an excellent handbook for a beginner.

THE Thornton-Pickard Company's new CATALOGUE contains particulars of several improvements which have recently been made in their time and instantaneous shutter, as also a new shutter for snap-shot and hand-camera work. This is said to be the only blind shutter which automatically covers the lens and protects the sensitive plate whilst setting for the next exposure.

THE second number of the PHOTOGRAPHIC REVIEW OF REVIEWS is admirable. The literary contents are selected with evident care and judgment. The Editor writes somewhat severely of the "namby-pambyism" prevalent among photographic societies, the truth of which we regret to have to admit, and Dr. Hall Edwards's discourses on the recent "Art Craze." The illustrations to the *Review* are capital, both in subjects and as specimens of photo-mechanical reproduction.

THE aim of the ILFORD MANUAL OF PHOTOGRAPHY (The Britannia Works Company, Ilford), by Professor C. H. Bothamley, is to serve as a trustworthy guide in the actual practice of the art. This aim is fully achieved, as the treatise is a clear exposition of the principles and practice of modern photography by a most able writer. The book includes a number of reprints of Mr. Howson's articles, various reference tables, and a list of dealers and dark rooms, and in printing and get-up is decidedly attractive.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 2381.—"Improved Magic-lantern Slide Carrier." B. R. REED.—*Dated February* 8, 1892.

No. 2387.—"Improved Photographic Enlarging Lamp." P. ELLIS.—*Dated February* 8, 1892.

No. 2391.—"Improvements in Attaching Photographic Lenses to Cameras." W. STANBURY.—*Dated February* 8, 1892.

No. 2608.—"Improvements in Photographic Cameras." L. M. ISAACS.—*Dated February* 10, 1892.

No. 2703.—"Improvements in, and relating to, Photographic Cameras." C. C. GILL.—*Dated February* 11, 1892.

No. 2749.—"Improvements in Shutters for Photographic Cameras." A. McE. SHERRIFF.—*Dated February* 12, 1892.

No. 2823.—"Improvements in Photographic Dark Slides." W. GRIFFITHS.—*Dated February* 13, 1892.

No. 2852.—"Improvements in, or relating to, Apparatus for Reflecting the Images of Opaque Objects, applicable also to Photographic Cameras." G. D. HUGHES.—*Dated February* 13, 1892.

No. 2879.—"Improvements in, or applicable to, Photographic Cameras." G. H. CRICKS and G. A. TAYLOR.—*Dated February* 13, 1892.

PATENTS COMPLETED.

IMPROVEMENTS IN AND RELATING TO AUTOMATIC PHOTOGRAPHING MACHINES.

No. 699. JOHN MACINTOSH MACKAY MUNRO, 136, Bothwell-street, Glasgow, and JAMES MACFARLANE, 9, Holland-place, Glasgow.—*January* 16, 1892.

THIS invention, which relates to improvements in automatic photographing machines, has for its object to make the action of such machines more simple and durable, and requiring less attention than hitherto.

The action of this improved machine is as follows:—The person to be photographed stands in front of the machine, and uncovers the lens, or the coin slot, or both, by pulling or pushing aside a handle or lever. This movement is transmitted, by cord, chain, metal rod, or other device, so as to wind up the weight or spring which actuates the mechanism to an extent sufficient for delivering at least one card. This arrangement of the winding appliance so as to uncover the lens or coin slot, or both, ensures its being properly attended to, and that without the operator being aware that he is winding up the machine.

An alternative method of securing this semi-automatic winding up of the machine would be to place the head-rest, with or without a reflector, on a lever or metal rod, so that the act of folding or pulling it down or up into position would wind up the machine. To ensure the proper use of this head-rest-winding arrangement, it would be fitted with an attachment, so that it could not be pulled down till the coin was put in the slot, and so that the finished card could not be delivered till it was replaced.

With the first method of semi-automatic winding the dropping in of the coin would preferably allow the machine to start; with the second, this object would be preferably accomplished by a small press button or pull.

Another alternative method would be to enclose the space between the reflector and the pillar, leaving a part next the machine in the form of a little gate, and so connecting the gate with the clockwork that the opening and shutting of the gate by the people entering or leaving during the use of the machine would, by the movement of the gate, accomplish the winding of the machine. To provide against interference with the mechanism by undue or ill-timed movement of the gate it is necessary to provide arrangements so that the action of the gate, and, indeed, of all the self-winding devices on the clockwork, will cease when it is fully wound up, and also so that the clock can be wound while the clockwork is going. We prefer to do this last by using a spring instead of a weight as the driving force, the winding arrangement being attached to the one end of the spring, and the clockwork to the other, so that the action of the winding does not interfere with the movement.

Another alternative method is to arrange the machine so that the finished card cannot be withdrawn from the delivery chamber until the cover is drawn aside, and the performing of this act winds the clockwork.

Another alternative method is to provide a strong pointer with a handle, with the directions that if not already there it be placed opposite the mark "Clear" or "Dull," according as the day is clear or dull. Besides uncovering the lens and increasing or diminishing the light aperture, this movement would wind the clockwork. The handle would of itself go back to zero when the photographic exposure was complete.

When the first mentioned method of uncovering the lens is adopted the details usually preferred are as follows:—A penny must be dropped in the slot before the lens cover is unlocked. The lens cover is then pulled aside. This may allow the mechanism to start, the cover remaining down until exposure is complete and then replacing itself, or to secure the greatest steadiness of the person being photographed the penny dropped into the slot may, after the lens cover is withdrawn, re appear at a lower slot, too small however to allow it to come out altogether. The actual starting of the clockwork would then be effected by pushing this same penny inwards.

We find it sometimes advantageous, in carrying out the above, to use the principle of the wheel and axle, or other mechanical method, to make the pull easier by increasing its travel relatively to the distance through which the weight is lifted. A pawl and ratchet is also sometimes provided to let the weight be wound without moving the clockwork, as in winding of clocks, and a second pawl and ratchet may be provided, so that levers or handles may be replaced without any effect on the clockwork or weight. A stop is provided, so that, when the clockwork is fully wound up, any further movement or working of the levers is spent upon a spring-tight or other slipping arrangement, which, while firm enough to lift and sustain the weight without slipping, is yet loose enough to slip before any injury can be done to the apparatus by improper use of the levers or pulls, or the same purpose may be effected by arranging so that the winding appliance is thrown out of gear when the weight is wound up, and not restored until it is run down or partly run down.

As one of the chief objects of making the above winding arrangements, instead of using ordinary clockwork periodically wound in the manner adopted in most machines hitherto in use, is to lengthen the time which the machine can work without attention, some provision is necessary for renewing the developing and other solutions. We accomplish this by having supply reservoirs of fresh solution, with overflow reservoirs for exhausted solution.

A tube from the fresh supply is led over or into the vessel containing the working solution, an air-valve or stop-cock being opened and closed at intervals by the clockwork-driven mechanism, so as to permit any desired quantity of fresh solution to pour into the working vessel. The old solution may either overflow at the surface into a suitably arranged receptacle, or the lower part of the working solution may communicate by a tube with a small reservoir arranged to keep at same level as the working solution and to overflow when it rises beyond the desired level. The receptacle into which it overflows must in either case be of such size and shape that it may receive the overflow safely, although the vessel containing the working solution be rotating or otherwise moving, or alternatively a syphon may be employed to remove the used solution, in which case it must be provided with a stop-cock or valve periodically opened by the clockwork mechanism.

If the machine is thus to be left for a considerable period without attention, there must be a large reserve of photographic sensitised plates, ferrotypes, or paper, as the case may be, with a delivery box. If very many plates are used, the weight of these plates pressing upon the slide interferes with its smooth working. To obviate this, the slide box may be made as an inclined plane or spiral, or otherwise, for all or part of its length, so that cards may be partially supported by the sides of the box, or, alternatively, a number of the plates may be supported by a special support, which may be gradually lowered, but will be finally drawn aside by action of the clockwork.

Or, instead of using a slide-box delivery, the cards may be so arranged as to alternately overlap each other to, say, about a third of their length or breadth, and be upheld by two pins or rods, placed one a little nearer each end than the overlapping part. When one of the pins is withdrawn or folded down, the card on its side drops down into position opposite lens, being guided thereto by the shape of the passage leading from below box to this position. The next card is sustained by the other pin, which remains underneath it, and, as this card overlaps the one above it, no other card can fall. So soon as the first card is delivered, the rod which first moved is replaced. When another card is wanted, the second rod similarly moves and releases a card. In this way, the rods being all moved alternately by the clockwork, the cards are delivered one by one. Another method would be to construct a circular box, within which the card would be laid spirally, so that each one would overlap for a part of its length and breadth the preceding card; the process being continued till the required number is placed in the box. Projections from the inner side of the outer surface of the box would be fixed so as to assist in placing the cards properly and to prevent them moving out of position till wanted. This box would rotate on its axis over a plate or series of balls or rollers, which would be so placed as to sustain all the cards except one. When this one card fell into delivery channel the card immediately above it in the spiral would be sustained by the overlapping of the cards next to it, and so on till the whole were exhausted.

Another alternative method would be to place the cards (ferrotype metal usually) standing upright on and across an inclined plane leading to the proper position before lens. The cards would be placed close, one against another, except that a very thin plate, preferably of metal, would be between each. This supporting plate would be so attached to an arm that each plate would support a card. These arms, with their plates, are lifted one by one by the clockwork, beginning at the end next lens. As each card is thus freed from its supporting plate it falls down on the inclined plane, sensitised side uppermost, and so passes to position opposite lens.

IMPROVEMENTS IN MAGAZINE OR DETECTIVE CAMERAS.

No. 2516. ARTHUR JOHN BUNCHER, Whittall-street, Birmingham.—*January* 16, 1892.

THIS invention relates to improvements in magazine or detective cameras, or, in other words, that class of cameras in which a number of sensitive plates are stored, and successively used or exposed, as occasion requires.

By my invention the plates are automatically taken from a pile or battery of plates, and from thence transferred to a position, face forward, at the back of the camera, and in a focussed position opposite the lens, which is situated at the front of the camera, while at the same time a previously exposed plate or plates is, or are, stored at the back of the camera, and at the back of the last transferred plate.

My invention consists, in the first part, in the construction of the camera box. In the second part, in means for feeding the sensitive plates from a pile to the camera. In the third part, in the construction or formation of the compartment for the reception of the pile of plates. In the fourth part, in a telescopic plate-feeder, and, in the fifth part, in guide or race means for elongating the plate-feeder, in order that the same can follow up the plates during their transit into a focussed position. In the sixth part, in means for tilting the plate prior to the engagement of its carrying frame with the hooked end of the feeder. In the seventh part, in the plate-carrying frames.

The camera box is an erect six-sided figure, open at top and rear, and with the front enclosed, and fitted with an inside disposed, or other lens. The front upper part of the box is made after the manner of a well or receptacle, with an open bottom, but with the opposite sides of the said well, in the direction from front to rear of the box, provided with plate rests, in the form of flanges or shelf strips, running about two-thirds from front to rear of the well as aforesaid, and then inclining or curving themselves downwards to vertical stop rests, against which the edges of the carrying frames of the plates rest when in a position for exposure.

Running parallel with the said plate and stop rests is a curved race or guide for the purpose as hereinafter described.

The underside of the back end of the partition of the well is open to a height of the depth of the plates from the tops of the horizontal rests, whilst directed at the upper back part of the camera, and in the same plane as the top of the horizontal plate rests as aforesaid, which supports the pile, is a platform or floor, with the fore part next to the partition of the back end of the well, open, wherethrough the plate to be transferred to its assigned position across the camera downwardly passes.

The rear termination of the platform or flooring is provided with an upwardly directed curve or inclined part for tilting or transferring the plates from a horizontal to an inclined position, so that the hooked end of the feeder can engage with a hooked fore part of the plate-carrying frame, so that, as the plates, which are placed face upwards, are transported or conveyed from the pile, they are slid rearwards, and followed up by the feeder, and their front ends then made to impinge against the aforesaid curve or incline, which lies within the path of their traverse, hence the first tilting of the plates by the said curve and the complete turning of them to a vertical position upon the front edge of the platform by the feeder.

The extreme back of the camera, which is the store for the exposed plates, has a spirally coiled spring, which admits of the spirals taking the same plane as each other when compressed, although a flat spring may be used in lieu thereof if necessary.

The feeder consists of an arm jointed at its lower end to the front of the camera, and adapted to turn inwardly, and with the axial ends extending through the opposite sides, for the operation of the same, by turns or short arms connected to them.

The upper end of this arm, or quadrant working arm, is provided with a supplementary piece, which works telescopically, and slides within its upper part, so as to admit of the feeder lengthening itself, consequent upon the angle made by it, and in order to follow up the plates in their traverse rearwards.

The two opposite edges of the supplementary sliding part have outstanding pins or studs, which work within races or upon guides of the figure or contour of the plate or stop rests, but with the lower parts of the said races or guides left open for the clearance of the feeder in the passing of the same back to its normal position, which is in front of the carrier, and beyond the front edges of the plate frames piled within the well or store.

The plate frame has an open front and a closed back, with the metal at two opposite sides turned over, and with the front middle part slightly extended and made hookwise, whilst the middle part of the closed back has a lip for holding the said plates in the frames.

Operation.

Assuming a pile of plates, face upwards, to be within the well, and a loose bearing plate to be placed at the back of the camera, and to be pressed home by the spring, the turning fully back of the feeder slightly lifts the plates, and brings the top edge of the supplementary part of the feeder on a level with, and at the back of the front edge of the bottom plate of the pile, and with the outwardly directed studs or pins taking within the race in the sides or walls of the camera. The turning inwards of the feeder causes its upper edge, as aforesaid, to impress itself against the bottom plate, which is then traversed rearward by the impingement, passing under the partition walls at the back of the well upon the top of the platform or table, and above the opening, and with the front part impinging against the incline, which said front part, on traversing up the same, tilts the plate upon the front edge of the platform, as a fulcrum, and causes the supplementary end of the said feeder to hook or link itself with the plate frame, which is then raised thereby into a vertical position at the back of the partition rear wall of the well, when the feeder and plate descend, with the latter coming at the front of, and pressing back the previously exposed plate or plates, if any; if not, then the false back, as aforesaid.

The front of the last-exposed plate bears against the vertical stop rests, and with the feeder lying flat upon the bottom of the camera box.

At the same time that the plate is transferred from the well to its position for exposing, the pins or studs of the supplementary part travel within the races, channels, or guides, and so distend or contract the telescopic part so that the end of the same shall constantly bear upon, or follow, up the plates. To transfer another plate from the pile, turn back the feeder, when the pins or studs return clear of the races, and the said feeder takes an erect position at the back of the then bottom plate of the pile, and with its pins or studs opposite to the entrance to the race.

Improvements in, or Appertaining to, Camera Obscuras, and in Devices whereby the same are Rendered Operative by the Insertion of a Coin of Predetermined Value.

No. 1482. Edward William Banner, 16, Hargreave-street, Southport, Lancashire.—*January* 23, 1892.

This invention relates to camera obscuras and to devices whereby the same are rendered operative by the insertion of a coin of predetermined value.

The camera obscura may be of any suitable form or construction, but, by preference, I propose to provide a rotatable dark chamber, of conical or other suitable form, having a flat screen or surface at the bottom, and a mirror at the top, which is adapted to reflect the image of the object on to the screen aforesaid. The object glass and eyepiece are placed in suitable positions, and when the apparatus is not in use, both are concealed by shields or protectors, which exclude light, moisture, and dust from the mirror and lenses.

The dark chamber is adapted to rotate on a suitable vertical spindle, having a pulley and weighted cord, or its equivalent, which causes the dark chamber, after being rotated, to resume its normal position, namely, the position in which the eye and the object glasses are concealed. In proximity to the spindle, I provide a pivoted lever, having at one end a suitable tray for receiving a coin of given value, and at the other a locking bar or block, adapted to resist considerable strain and pressure, and formed to engage a tooth on the spindle and lock it firmly in one position.

The mode of action is as follows:—

On dropping a coin of predetermined value through the slot of the machine, it falls on to the tray aforesaid, and its weight overbalances the pivoted lever, raising the locking block or bar, and freeing it from engagement with the tooth on the spindle. A stop prevents the said block from rising more than a given height. The spindle being now released, the operator can rotate the dark chamber by a handle, thus moving it away from the shields or protectors which conceal the object and eyepieces. By this movement the stop aforesaid is also moved, the coin tray is further depressed, the coin drops off into a money receptacle, and, the weight of the coin being thus removed, the locking block resumes its normal position. The beams of light enter through the object glass, the image of the objects in the field is reflected by the mirror on to the screen, and the picture is revealed to the operator on his looking through the eyepiece. The object glass and eyepieces may be provided with lenses or with plain glass, whichever is desired, and the latter has a hood, which prevents light passing into the chamber when a person is looking into the camera.

By slowly rotating the dark chamber, a complete panorama of views of the surrounding neighbourhood is portrayed on the screen, and, at the same time, the weighted cord, or its equivalent, is wound up.

When the operator has finished, he releases the handle, the dark chamber rotates back by the weighted cord, and the spindle is locked in the manner already described, the locking tooth being chamfered at one side to facilitate its passing the locking bar. The object glass and eyepiece are thus again concealed by the coverings aforesaid, until released by a coin in the manner already set forth.

The screen may, if desired, be capable of adjustment so as to bring it into proper focus. Suitable stops are provided to limit the rotation of the dark chamber.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
February 22.....	Dundee Amateur	Asso. Studio, Nethergate, Dundee
" 22.....	Gloucestershire	
" 22.....	Lantern Society	20, Hanover-square.
" 22.....	North Middlesex	Jubilee Hall, Hornsey-road.
" 23.....	Brighton.....	Arch 40A, King's-road, Brighton.
" 23.....	Great Britain (Technical)	50, Great Russell-st., Bloomsbury.
" 23.....	Lancaster	Storey Institute, Lancaster.
" 23.....	Leith Amateur.....	
" 23.....	Warrington	Museum, Bold-street, Warrington.
" 24.....	Bath (Annual)	Roy. Lit. & Sc. Inst., Terrace-walks.
" 24.....	Burnley	Bank Chambers, Hargreaves-street.
" 24.....	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 25.....	Birmingham	Lecture Room, Midland Institute.
" 25.....	Camera Club.....	Charing-cross-road, W.C.
" 25.....	Hackney.....	Morley Hall, Triangle, Hackney.
" 25.....	Halifax Photo. Club	Mechanics' Hall, Halifax.
" 25.....	Hull.....	Royal Institution, Hull.
" 25.....	Ireland	Rooms, 15, Dawson-street, Dublin.
" 25... ..	Liverpool Amateur.....	Crescent Chambers, 3, Lord-street.
" 25.....	London and Provincial	Champion Hotel, 15, Aldersgate-st.
" 25.....	Oldham	The Lyceum, Union-st., Oldham.
" 26.....	Cardiff.....	
" 26.....	Holborn	
" 26.....	Maidstone	"The Palace," Maidstone.
" 26.....	Richmond	Greyhound Hotel, Richmond.
" 26.....	Swansea	Tenby Hotel, Swansea.
" 26.....	West London.....	Chiswick School of Art, Chiswick.
" 27.....	Putney.....	High-street, Putney.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

February 11,—Mr. J. Barker in the chair.

Mr. J. Howson presented a copy of the *Ilford Manual of Photography* for the library.

Messrs. A. I. Taylor, J. Pearce, and A. Ullman were elected members of the Association.

Mr. J. Howson said, with regard to the subject of permanency of gelatine prints on Alpha paper, introduced at the previous meeting, the pictures in The British Journal Photographic Almanac for 1887 were produced by Mr. Urie, of Glasgow. At that time that gentleman's automatic machine was not perfected, and there was some difficulty in getting the prints in time. Mr. Harman visited Glasgow, and found they were being produced "acid toned and without any gold." Mr. Harman pointed out that permanency was improbable under this treatment, and it was arranged that this should be remedied. This would account for some of the prints in the Almanac fading while others remained quite perfect. Speaking of the permanency of gelatine over albumen prints, he said the former were to be preferred, and quoted several authorities on the subject. He passed round some prints on Alpha paper which were exposed November 1886, and developed November 1891, claiming that they were as good as if exposed recently. He concluded that Mr. Debenham had not been reported correctly when he was said to have classed gelatine and albumen together.

Mr. Debenham said the report was correct; the chances were often in favour of a developed print rather than one printed out. He questioned whether any "authorities" of importance had said that albuminate of silver was the sole cause of the fading of prints on albumenised paper. Only a few weeks since Mr. Bolas had explained the causes of fading. He considered photography had suffered by persons stating that silver prints were permanent. There could be no guarantee as to the permanency of silver prints.

Mr. F. A. Bridge said he had recently been shown some stereoscopic prints on albumenised paper made thirty years ago. Some of them were equal in every way to prints produced recently.

Mr. E. Milner said he had a few days ago examined a collection of prints made in 1856, which were apparently unchanged.

The Chairman had some old prints which had never been toned at all, and these were perfectly good.

Mr. Howson then introduced the subject of the evening, viz., *Isochromatic Plates*. He mentioned Colonel Waterhouse as having used eosine with collodion, and considered that hearty thanks were due to Tailfer for his method, and to Messrs. B. J. Edwards & Co. for bringing it before the photographic world. He questioned whether landscape work was improved by the introduction of a yellow screen, as sometimes the colour became over-corrected.

by its use. He explained that at one time he was sceptical as to the advantages of isochromatic plates, but a little experiment which he made, and which he would introduce to the meeting, convinced him of their utility.

Mr. Howson then exposed half an isochromatic plate and half an ordinary plate behind a negative, in front of which were four strips of coloured glass (blue, yellow, green, and red). On development the result was in favour of the isochromatic half, only one section being visible on the ordinary plate.

Mr. EVERETT asked if isochromatic plates would give correct results without a yellow screen?

Mr. AUSTIN EDWARDS said it had never been claimed that isochromatic plates gave absolutely correct gradation.

Mr. EVERETT quoted from an advertisement wherein it was stated that "These colour-sensitive plates yield isochromatic effects *without a coloured screen*."

Mr. COLLS said a yellow screen necessitated about six times the ordinary exposure, and for studio work this was impossible. Without a screen he had never found any difference between an isochromatic and an ordinary plate, say, on such subjects as a blue sash, or a white frock, or a face covered with freckles.

Mr. DEBENHAM objected to the statement that eosine without ammonia was useless. It had been proved to the contrary by reliable workers. Besides, Obernetter's plates gave good results, and these were not prepared with ammonia. He questioned whether we were so much indebted to Tailfer as to Colonel Waterhouse.

Camera Club.—February 11.—Commander C. E. Gladstone, R.N., gave a lecture on *Architecture in Normandy and Brittany*. Sir George R. Prescott, Bart., occupied the chair. Previous to the lecture, Mr. Maskill handed round a torsioscope, lent by Messrs. Adams & Co., an instrument devised to show eccentric distortions of portraits, and the Hon. Secretary exhibited some novelties in shutters sent by the Thornton-Pickard Manufacturing Company. Commander Gladstone's lecture consisted of an exposition of the leading beauties and features of church and domestic architecture in Normandy and Brittany. Each point was illustrated by lantern slides of very high quality. The history and growth of art in architecture in those countries was described, and a comparison between French and English styles and details instituted. On February 22, Messrs. Humphery and Davison will give a demonstration of printing in platinotype and development in the course of elementary lectures at the Club. On February 25, a series of lantern slides will be shown by Mr. J. B. B. Wellington, chiefly pictures in Norway.

The Lantern Society.—February 8.—Mr. G. R. Baker read a paper on *Dissolving Views, and How to Exhibit Them*. Mr. Baker commenced by speaking of the early history of dissolving views, and showed, by means of the lantern, how registration of the slides was effected in those early days. He then explained the methods of preparing slides for effects, and showed the most recent arrangement for obtaining accurate registration of slides, at the same time pointing out the difficulties that have to be got over to obtain a satisfactory result. He then showed a number of slides showing how effects could be obtained by means of two or three lanterns, the use and management of the tilter, the rolling curtain, and various methods of dissolving and changing slides. Photographs of Sir David Salomons' beautiful lantern were then shown on the screen, and Mr. Baker pointed out the various adjustments that had been made to get as near perfection as possible. At the conclusion of the paper, a number of high-class hand-painted slides and effects were shown with the triple lantern.

Hackney Photographic Society.—February 11, Mr. J. Hubert (Vice-President) in the chair.—Mr. Hepworth delivered a lecture on *Illustrated Journalism*. Introducing the audience to a "rag shop," he proceeded to trace the manufacture of paper from that source to the point where its ragged appearance is changed to the elaborate clothing of spotless material, suitable to receive the articles of such papers as the *Graphic*, *Daily Telegraph*, &c. The lecturer illustrated the methods of ancient and modern newspaper illustrations in a striking manner. The photographs taken personally by Mr. Hepworth included one where the stoppage of the machinery for that purpose occasioned the loss of three pounds, though it lasted only a few minutes. The different stages of preparing the drawings, often from the scantiest materials possible, such as a few lines, with marginal notes to indicate crowds, trees, &c., were developed truthfully into the beautiful pictures produced in first-class journals. The subject was specially interesting to photographers, inasmuch as it taught them to what extent photography had replaced the crude methods of the past. Mr. A. L. Henderson will give a lecture on *The Riviera* on Thursday, the 25th.

West London Photographic Society.—February 12, Mr. Hilton in the chair.—Mr. L. C. Bennett was appointed Secretary, and Mr. W. S. Rogers Assistant Secretary in place of Mr. Harry Selby and Mr. Leslie Selby, resigned. After the formal business Mr. J. A. Hopkins read a paper on *The Plate, the Negative, and some Remarks on Dodging*. He mentioned the different characteristics of commercial plates, and described the process of emulsion-making, dwelling on the advantage of using iodide. Although he did not wish to minimise the importance of what was called a good technical negative, it was still more important to photograph with a motive, and develop something to the particular effect desired, which would give a more artistic result, as a rule, than merely aiming at technical excellence. In his hands pyro, as an all-round developer, worked best, although he should not wish those who succeeded with any other developer to discontinue the use of that by which they got good results. His impression was that plain pyro was best for negatives, giving, upon the whole, the best prints, and showing truer gradation than when a preservative was used. He touched upon the various "dodges" that could be resorted to to improve the negative, mentioning, amongst other things, tissue paper, which was pasted on to the back, and then worked on with pencils of varying hardness, which could be easily done without injuring the negative in any way. Mr. WHITING spoke of the advisability of sticking to one kind of plate for all-round work, as it was easier to master the development and get the effect desired than by constantly changing. He rather disagreed with Mr. Hodges as to the advisability of using dry pyro. He thought the yellow colour of a negative so developed was rather misleading in printing; he could not see that the gradations obtained were any truer than when a preservative was used, in which case the density could be judged of better. One way of working on a negative which he thought good was to varnish the negative with white, hard varnish, thinned down considerably. When dry, rub the surface rather hard with the finger, and it would presently rub up white and rough, and then would be produced one of the best surfaces to work on that could be obtained. Afterwards dab the finger, covered with chamois leather, into a little powdered plumbago, and rub lightly on any parts of the negative that required intensification, or the surface could be worked on with a pencil. Mr. COLLS said he sometimes rolled up a little red ochre in some putty, and dabbed it on the back of the negative. It gave a good opaque matt surface, and could be strengthened easily by a little harder dabbing on the required parts. Mr. MILLER objected to such extensive dodging as was often resorted to. He thought it was much better, instead of using pencil, brush, crayon, and so on so extensively on a negative, to use them on drawing paper, and he referred to the practice of working on prints which he had seen at exhibitions in very uncomplimentary terms. Messrs. H. Selby, Winter, Stein, and others also took part in the discussion. The future meetings of the Society will be held at the Chiswick School of Arts, Bedford Park, Chiswick.

Putney Photographic Society.—February 10, Dr. W. J. Sheppard in the chair.—The Rev. L. Macdona read a short paper on *Lenses*, the third of the series. Speaking briefly on the principles of light, he described the action and construction of the various lenses in the market, single and double, narrow-angle, wide-angle, &c., pointing out the particular uses of each variety. For general all round use he recommended a rapid rectilinear or rapid symmetrical, whose focal length was equal to one and a half times the length of the plate to be used. Some rough metal castings, finished castings, rough crown and flint glasses, polished glasses, and the complete finished lens, all kinds supplied by Messrs. Taylor, Taylor, and Hobson, were passed round, and served to illustrate the lecturer's meaning. Samples of the Eastman extra rapid bromide paper were distributed at the close of the evening. On February 27, *Exposure*, Dr. J. F. Farrar.

Richmond Camera Club.—February 12, the President in the chair.—Mr. St. John Hunt showed and explained Roberts's hand camera, Mr. Arthur Hunter a home-made apparatus for viewing lantern slides, and Mr. Ramsey some negatives and positives enlarged with cresco-fylma, and some by a process of his own discovery. Mr. Hodgkin then read a paper on *Photographing Pottery*, explaining that he had taken up that branch of work at the request of his father, Mr. J. E. Hodgkin, who was bringing out a book on the inscriptions on early English pottery, with illustrations, chiefly from his own valuable collection. For this purpose Mr. Hodgkin photographed some fifty or sixty pieces, most of them by lamplight, and his paper clearly explained his *modus operandi*. Edwards's isochromatic plates were used, the reflection and distribution of light varied to suit each subject, and exposures of varying duration, up to four hours, were given. A paraffin lamp, with ground-glass globe, was the principal source of light, a candle being placed as near as possible to the object to bring out the highest light at the proper point. The required negative having been obtained, a silver print was sent to a firm in Vienna for reproduction by photo-mechanical process. Specimens of negatives and prints were handed round, and showed how successfully Mr. Hodgkin had carried out his difficult task. One of the process blocks was also shown, and a proof copy of the book, which is doubtless destined to become one of the standard works on ceramics.

Birkenhead Photographic Association.—February 11, the President (Mr. G. A. Carruthers) in the chair.—Some prize slides had been announced as the attraction of the evening, but they failed to turn up, owing to some error in the date of booking. An excellent programme for the entertainment of the members was, however, provided by the President and the Secretary, the former exhibiting a set of slides in description of a trip in the north of Ireland, whilst the latter read an illustrated paper on "Emral," Flintshire, the ruined family mansion of the Pulestons. The limelight used during the evening was produced from oxygen alone, by means of A. W. Scott's warm air saturator, which was manipulated by Mr. W. F. Archer, of Liverpool.

Bristol and West of England Photographic Association.—February 12, the President in the chair.—The Secretary distributed some samples sent by the Eastman Company of their rapid bromide paper. They also sent a neat and well got up *souvenir* of the Washington eleventh annual Convention. After some discussion on the local photographic survey, Mr. HARVEY BARTON gave a lecture explaining his new apparatus for flashlight portraiture. The prints shown were soft and very nice. An adjournment was made to Mr. Barton's studio, specially fitted up for flashlight work, and some half dozen plates exposed on different people present were afterwards developed, and turned out perfect negatives. Mr. Barton uses eight flashlamps (connected together by piping with bellows) placed ten or twelve feet above the ground, muslin curtains being placed between the sitter and the lights. Half a grain of magnesium powder is used each time in each lamp, which contains a sufficient quantity for a number of discharges. On February 19, the Secretary will give a short paper on *Photographic Prints in Colours*.

Derby Photographic Society.—February 9.—A quantity of sample packets of Eastman's bromide paper were distributed. The Thornton-Pickard Company also sent specimens of their new shutters, which were much appreciated. It was proposed to hold a *conversazione* and public exhibition of members' work early in November, thus giving the members an opportunity of preparing pictures for this purpose during the summer.

Preston Camera Club.—February 11.—Mr. Macintosh gave a practical demonstration of lantern-slide making by contact. This Club intends to hold an exhibition of members' work, with lantern evenings, on March 1, 2, 3.

Correspondence.

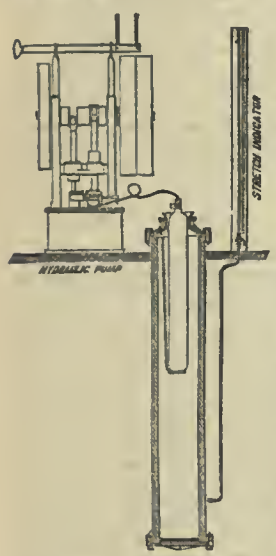
☞ *Correspondents should never write on both sides of the paper.*

TESTING OXYGEN CYLINDERS.

To the EDITOR.

SIR,—My attention has lately been drawn to several letters in your JOURNAL touching upon the strength of oxygen cylinders, and it has occurred to me that some of your readers may be interested to learn how they are treated before being placed upon the market.

It has generally been considered sufficient to test cylinders by simply pressing them with water to the desired pressure, but this system is very faulty, inasmuch as, although it shows a cylinder's capability of withstanding the required pressure on that occasion, it does not indicate if it has become damaged thereby. To overcome this difficulty, several trials were made in 1890 with an apparatus which was designed to indicate the stretch of cylinders, with which very marked results were obtained, and this plan of testing has now been adopted at these works.



The illustration shows the testing apparatus, which explains itself. Each cylinder, on reaching the works, receives a number, by which it becomes known; it is filled with water in the usual manner, and is placed vertically in an iron envelope, as shown, and is supported by three chains. The envelope also is filled with water to the exclusion of air. A perfect joint is made round the shoulder of the cylinder by means of a flexible rubber ring, which can be at will instantaneously inflated by means of water drawn from any convenient source; in this manner all communication between the envelope and the atmosphere is closed, with the exception of an outlet through a small-bore glass tube, which serves as an indicator of displacement or stretch. The cylinder is then coupled up to the hydraulic pump, and the test is made as follows:—The height of the water in the gauge glass is first marked. The pressure is then put slowly into the cylinder by means of the pump, and stretch in every case is shown from the moment the first indication of pressure is seen on the pressure-gauge; the water in the gauge glass rises with every stroke of the pump, until the maximum pressure is reached, on release of which it falls, with good cylinders, to its original position, showing that the elastic limit of the metal has not been passed, and the cylinder in no way damaged. The cylinder is then stamped with the test-mark if proved sound, the pressure of the test, and the date, and the test is recorded in a book, with the name of the maker and the signature of the person who saw the test carried out.

All cylinders destined for a working pressure of 1800 pounds are in this manner tested, in these works, to 4000 pounds per square inch; and, for fear of over-straining them, special care is taken that the makers do not previously test them to more than this pressure, which is considered to be a safe and sufficient test for cylinders of the section and quality of steel now employed.

I feel that I have already trespassed on your space, and will not go into the many experiments which have been made, but will simply point out that a forty-foot oxygen cylinder, when tested to 4000 pounds, has sufficient elasticity to displace, an an average, a column of water 22 inches high × ¼ inch diameter, and to return again to its original state; this cylinder would measure 5½ inches diameter × 31 inches long × $\frac{7}{32}$ inch thick. It will, therefore, be readily seen that this system of testing gives an insight into the behaviour of the cylinder whilst under pressure, with sufficiently broad results to be easily applied and appreciated in the ordinary workshop by any intelligent man.—I am, yours, &c.,

HENRY BRIER.

The Scotch and Irish Oxygen Company, Limited, Glasgow,
February 15, 1892.

PERSONAL.

To the EDITOR.

SIR,—Mr. Coles, at the meeting of the London and Provincial Society, as reported in your last, plainly suggests that I misquoted Professor Burton, with a view to make good my statement. This is a question of fact, and can easily be verified, if true, and I invite Mr. Coles to do so, or to make apology for thus traducing me. I press this point because I am known to be more than moderate in any claims I make, and I do not want to lose this reputation undeservedly.—I am, yours, &c.,

JOHN HOWSON.

The Britannia Works Company, Ilford, London, E.

RATIO OF GRADATION.

To the EDITOR.

SIR,—Does not all this discussion arise out of a mere confusion of terms? Nine hundred and ninety-nine photographers out of one thousand use the word density (as applied to negatives) in the sense of opacity, that being the only property of the deposit which is of importance in the printing frame. But Messrs. Hurter & Driffield (and Mr. Phillips in your last issue) use the word density as signifying the amount of silver deposited on a given unit of space, which is an entirely different matter.

Therefore, while Messrs. Hurter & Driffield may be, and probably are, quite correct in saying that the ratio of gradation in density cannot be altered by development, the practical photographer is equally correct in asserting that it is an every-day experience with him to alter the ratio of gradation in *his* density (or opacity) by a modification of development.

Messrs. Hurter & Driffield's original article in the *Journal of Chemical Industry* was a difficult nut to crack, but they put the matter in a clearer light in the April number of your defunct contemporary, the *Photographic Art Journal*.—I am, yours, &c.,

ALFRED WATKINS.

Hereford, February 12.

To the EDITOR.

SIR,—The thanks of photographers are due to Messrs. Hurter & Driffield for publishing the results of their further experiments detailed in your issue of February 12. Unfortunately, the conditions of that experiment do not seem to have been made to approximate as nearly as could be wished to the conditions present in the case of the experiment of Captain Abney, with which a comparison is sought to be made.

The problem is this:—

1. A plate is exposed upon a subject for such a time that a given density (rightly, and quite usefully, described as printing density) is developable in the parts of the negative which represent the least bright parts of such subject.

2. The range of gradation in the subject is such that the application of a normal developer to the plate so exposed results in full printing density being developed in those parts which have been exposed to the brightest lights before the parts which have been exposed to the least bright light show sufficient developed density to be of printing value.

These being the postulates, is it possible, by an alteration of the relative constituents of the developer, to develop up to printing density the parts which have been exposed upon the least bright portions of the subject by the time that, or before, the parts exposed to the brightest portions have attained full printing density?

Captain Abney says that it is possible, and that he has done it.

A consideration of the result of Messrs. Hurter & Driffield's experiment, tabulated in the column headed B, would seem to show that the second of the conditions postulated was not complied with, for the application of the normal developer resulted in developing a very considerable relative density in the parts of the plate which had been exposed to the least light at the time when the parts exposed to the brightest light had attained what may be described as full density.

In other words, the range of gradation, though apparently great (being 1 : 64), "is insufficient to decide the question;" and this objection was foreseen by Messrs. Hurter & Driffield, for they state, apparently as a reason for not taking a more extended range of gradation, "that the total range of gradation which the plates we used were capable of rendering truly lies in between exposures of 40 and 220 candle-metre seconds."

It may, however, be remarked that photographers have to do the best they can with the total available potentiality of rendering gradation of which the plate they are using is capable, and that if in practice a subject has such an extended ratio of gradation that at both ends the plate is incapable of rendering it with mathematical accuracy, nevertheless, they must make the nearest approach possible thereto; and, if science is to aid them in their work, science must investigate, by means of experiment, the factors which come into play when the plate is forced beyond its capacity, and made to render, as well as it can, such an extended range of gradation.

Once more, therefore, in searching for an explanation which will reconcile the apparently discrepant results given by exposures in the field and exposures in the laboratory to a sensitometer (using that word as it was used by me before, and as I conceive it rightly may be used, not as meaning exclusively Warnerke's or Spurge's sensitometer, but generically to describe any apparatus for facilitating the exposure of photographic plates to lights of various intensities), we are led to suspect that the explanation will be found by a consideration of the effects of over-exposure, perhaps carried so far as to result in partial reversal, and that, under the abnormal conditions thus introduced, the action of the developer may itself be

abnormal, in the sense that alterations of its constituent parts may effect changes in the resulting negative different both in kind and in degree from those which would have been effected had there been no over-exposure.

A very simple example of general occurrence will exemplify this. A plate may be so over-exposed that the application of a normal developer, however long applied, will result in a flat negative—*i.e.*, one in which there is no great density in the highest lights, and a clouding of the shadows. If, however, a suitable developer be applied instead of the normal developer, density may be developed in the highest lights, and the shadows remain clear. Surely the ratio of gradation in such a case is altered, and, if so, is not unalterable by the constituent parts of a developer, which is the proposition Messrs. Hurter & Driffield adhere to, though it appears now contrary to what I believe was the general impression of readers of their original paper, that they are not prepared to assert that the *ratio of gradation* is the same, or practically the same, whatever developing agent be used. Perhaps they will forgive me for pointing out that the passage cited from their original paper, "There is a theoretical possibility that a plate may be rapid to one developer and slow to another, so as to require different exposures according to the developer used," does not imply that there may be any variation in the *ratio of gradation* if different developers be used, but merely that, with a developer X, a plate would be slow, showing only the effects of exposures equivalent, let us say, to 40 and 20 candle-metre seconds; whereas, with a developer Y, the same plate might show the effect of the feebler light of 10 candle-metre seconds as well as the 40 and 20.—I am, yours, &c.,

Davos-Platz, Switzerland, February 14, 1892. M. J. MICHAEL.

ALUMINIUM CAMERA FITTINGS.

To the EDITOR.

SIR,—As some of your correspondents were good enough to put me on the right track for procuring aluminium, it may interest them, as well as other readers of your JOURNAL, to learn the result of my inquiries.

One letter was returned, noted "Gone away." In a second I was told, "We shall be glad to quote for whatever quantity you require." In the third case a list was enclosed, from which, for the information of your readers, I extract the following prices per pound, ninety-eight to ninety-nine per cent. pure:—

Sheet: B. W. G., 0 to 14,	8*s.* 2*d.*;	15 to 24,	9*s.* 3*d.*;	25 to 30,	10*s.* 3*d.*
Wire:	,, 10*s.* 6*d.*;	,,	10*s.* 9*d.*;	,,	11*s.* 6*d.*
Rod: ½–¾ inch,	10*s.*;	⅛–½ inch,	9*s.* 8*d.*;	¾–1 inch,	9*s.* 2*d.*

As I was passing through Birmingham I thought it well to pursue my inquiries. I was directed to a shop in Warstone-lane, which I could not find; but, seeing a likely shop in the immediate neighbourhood, I went there to inquire. My questions were answered with some evasion and reluctance, and, upon stating that my idea of the price was from 8*s.* 6*d.* to 10*s.* a pound, I was laughed to scorn, and told that aluminium in ingots was 3*s.* 6*d.* an ounce (say, three shillings and sixpence an ounce)! Eventually, I bought some ingots, warranted ninety-nine per cent., at 4*s.* a pound (four shillings a pound).

When I was last in London I procured sheet aluminium, cast rods, and castings for milled heads from stock patterns from the Phœnix Engineering Company, 40, Prince's-street, Stamford-street, S.E. These, including a triangular tripod head, with castings for nut and screw, cost me 21*s.* The quantity was considerably more than I shall require for one half-plate camera; but, as I have had no experience in working the metal, I thought it best to allow for wastage.

Being in Birmingham again about a fortnight ago, I extended my inquiries. At a metal and tube shop I was asked, for aluminium ingots, 8*s.* 6*d.* an ounce! This, I was told, was absolutely pure; but, upon pressure, it came down to ninety-nine per cent. A camera manufacturer was good enough to supply me with a small quantity of sheet at 5*s.* a pound; at another shop I was offered ingots at 2*s.* 9*d.* a pound. It is quite beyond my power to explain these discrepancies.—I am, yours, &c.,

February 16, 1892. QUADRILOBINUS.

A COMEDY OF ERRORS.

To the EDITOR.

SIR,—In your last issue reference is made to me in a way that is misleading. The facts of the matter are these: I have on several occasions urged that *gelatino-chloride* prints, being minus that unstable compound albumenate of silver, or any equivalent thereof, may be considered as permanent.

To this end I have quoted the opinions of Captain Abney, Professor Burton, Mr. Chapman Jones, Mr. C. H. Bothamley, and Mr. E. J. Wall, as scientific experts; of Mr. John Barker and Mr. John Stuart as practical workers—on whose theory and practice I have founded my claim.

Mr. Coles first attacked me, saying that certain *bromide* prints had faded. I replied that bromide was not in question, and, if it were, we must first know whether the prints had had proper manipulation.

Now some *Alpha* prints are brought out, some of which have faded.

As we have since ascertained that many of these prints were "acid-toned," being passed out of the acid-clearing bath direct into hypo, owing to the culpable carelessness (or worse) of the photographer who made them for us, there need be no surprise that many of them have faded; but this has not any bearing on the question whether gelatine prints in general are unstable or otherwise, neither has it the very remotest reference to my original claim for *gelatino-chloride*.

Mr. Debenham is reported, in one of your contemporaries, to state "that he did not, of course, include as wanting in permanency those images which, printed originally in silver, had been converted by substitution into gold or platinum."

Qualifying this by excepting albumen prints, owing to the possible formation of albumenate of silver, as above mentioned, this confirms to the full my opinion, and I shall therefore continue to consider Ilford printing-out paper as permanent until some higher authorities than those I have quoted, or some well-proved facts, show I am wrong.—I am, yours, &c., JOHN HOWSON.

The Britannia Works Company, Ilford, London, E.,
February 18, 1892.

A PHOTOGRAPHIC INSTITUTE.

To the EDITOR.

SIR,—In your article last week on *A Photographic Institute*, I observe that you would exclude the teaching of art at present, on the ground of some uncertainty in the minds of photographers as to what is "the meaning and application of Art in relation to photography." The very statement that you make, that just now every one has his own pet idea, might have suggested that many must of necessity be wrong; and, if so, the greater the reason for Art being included in a projected curriculum.

The importance of this subject to the general public, to say nothing of photographers, coupled with the fact that personally I have taken very great interest in this subject, and, inferentially from the pet ideas, wasted much breath and ink on it, may possibly excuse my intruding an idea of my own on your notice.—I am, yours, &c., PHILIP H. NEWMAN.

February 13, 1892.

WEST LONDON PHOTOGRAPHIC SOCIETY.

To the EDITOR.

SIR,—The Council of the West London Photographic Society desire to call the attention of photographers residing in the west of London, particularly Chiswick and Gunnersbury, to the fact that the head-quarters of the Society have been moved to the Chiswick School of Arts and Crafts in Bath-road, Bedford Park, one minute's walk from Turnham Green Station, and they hope to have a considerable accession of members from that district. They have arranged to hold frequent meetings of a social character in addition to the ordinary meetings, when papers are read, &c.; and, considering that the Society is now so well known, they think that many ladies and gentlemen would like to join it now that it has moved to Chiswick. Any information as to the Society will be gladly furnished.—I am, yours, &c., LIONEL C. BENNETT, *Hon. Sec.*

30, *Blandford-road, Bedford Park, Chiswick.*

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Will exchange an excellent Lerebour whole-plate portrait lens for a good quarter-plate set.—Address, P., 3, Hinckley-road, Leicester.

Wanted, Dallmeyer's patent "3 D" lens in exchange for really good backgrounds, interiors, exteriors, and graduated.—Address, DRAYCOTT, 11, Gold-street, Northampton.

Wanted, posing chair, smoking-chair pattern; will exchange English lever silver watch.—Send photograph to J. C. O'LOAN, 26, Fernside-terrace, the Common, Woolwich, S.E.

Wanted, 15 × 12 rapid rectilinear or symmetrical lens, by Dallmeyer or Ross, in exchange for pneumatic safety bicycle; difference adjusted.—Address, J. H. GERMAN, photographer, Paignton, Devon.

I will exchange background (interior), 8 × 7, for a graduated ditto; also half-plate single landscape lens and Tylar's print washer for tapestry curtain or exterior background.—Address, FRED. C. D. HUBD, Shepton Mallet.

Wanted, good lantern or half-plate camera in exchange for eight volumes of the JOURNAL, three volumes bound, all complete and clean as new, with plates, ready for binding, up to December '91.—Address, SIDEY, 35, Richmond-road, Dalston, E.

Will exchange whole-plate portrait lens, by Derogy, Paris; Kershaw's instantaneous shutter; Perkin, Son, & Haymont's instantaneous shutter. Wanted, studio chair or table, balustrade or rock, in exchange.—Address, Porter's Studio, Chippenham.

Will exchange very fine 12 × 10 lens, by Horne & Thornthwaite, rack and pinion, two interior canvas backgrounds, large size Booth's mitre machine, nearly new, Optimus rocking print washer for 9 × 7 prints; wanted, 1 × 1 lens for views, ship's bulwark accessory, or rock accessory.—Address, COUSE, Durham-street, Hartlepool.

I will exchange a Burr's extra quick-acting portrait lens, No. 2*a*, two and three-quarter inches diameter, four and a half inches focus, cost six guineas, in new condition, for a good half-plate folding camera and stand, with three double slides; also a well-made mahogany Kinnear camera, screw adjustment, one single and one double slide, for a good half-plate rapid rectilinear lens.—Address, GRIMSHAW, 16 Dale-street, Haslingden, near Manchester.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

W. M. BUTLER and F. S.—Thanks; in our next.

JAS. CONNOLLY.—A piece of washed chamois leather.

W. R. THOMSON.—We have no information beyond that which appears in the report referred to.

ARTHUR BUTLER (10, King's-square, E.C.).—Mr. H. J. Channon's address is, Woodlands, Lewisham, S.E.

A. B. M.—Unless the copyright is registered, no proceedings can be taken for its infringement, or, at least, they would be of no avail.

A. HENDRY.—The letter *re* the Kimberley Exhibition appears in the JOURNAL for September 18, 1891. It gives all the information required.

A. W. N.—No great skill is required in enamelling prints. By following the instructions referred to, a little experience will beget proficiency.

E. DENVERS.—An article on another page will give about all the information you require. If that does not make the matter clear, write again.

REV. WALTER MARSHALL.—"Stereoscopic Photography" forms the subject of our article in the ALMANAC for 1887. This will probably suit your purpose.

E. J. S.—1. None that we are aware of. 2. Weak gaslight would suffice. 3. No. 4. Practically about the same sensitiveness. 5. Yes, if no moisture be present on the stone.

QUADRAGESIMUS asks: "Nickel-plated screws, &c. Will any one kindly tell me where to procure nickel-plated hood screws (brass or iron), and aluminium strap and butt hinges?"

PRINTER.—Dextrine, though a very convenient mountant, should never be used for photographs, as it is invariably acid, and therefore likely to act deleteriously on the picture.

A. WOOD & SON (6, St. Bernard's-row, Edinburgh).—We have not kept the address of "Lux," who wrote us regarding a prism. Perhaps, if he sees this, he will communicate with you direct.

M. GARDNER.—The process by which opal pictures are produced of the colour of red chalk, or the Bartolozzi tone, is the "carbon" process, the tissue being made with a suitable red pigment.

BERKS.—The work is in German, and there is no English edition of it. As it was published some years ago, and consequently is not up to date, there is no probability of one being issued now.

P. CORNELL.—In making chloride of gold for toning silver prints, the small quantity of alloy, when using current gold coins, may be entirely disregarded, as its presence will practically do no harm.

C. RAYNER.—If the carbon tissue in its insensitive state has become mouldy through being kept in a damp place, it is, we fear, of little use. The only way to determine the point for certain is to sensitise a piece and try it.

S. PRATT wishes to make a solution of indiarubber in chloroform, and asks if methylated chloroform will answer the purpose, or must the more costly kind be employed?—The methylated will answer quite as well as the other.

CARL NORMAN & Co.—The address of the Frederick Crane Company, the makers of the varnish mentioned at p. 762 of the ALMANAC, is Birmingham, but Mr. J. R. Gotz, of 19, Buckingham-street, Strand, is their London agent.

R. H. P.—The prints themselves are not in the least altered. The paper has, however, undergone a change for the worse. You must bear in mind that, in this regard, photography is almost entirely at the mercy of the paper makers.

BURNISH.—There are so many good burnishers now in the market that it is very much a matter of taste as to which is considered the best. It may, however, be taken somewhat as a guide that price, in a great measure, governs efficiency and durability.

C. JONES.—1. Perhaps some of the readers of the JOURNAL may be able to supply you with "a good formula for removing the silver stains from a negative." We are not aware of one. 2. There is no reason why the solutions should not be kept mixed.

R. G.—Gelatino-bromide prints are obtained by development of a latent image exposed to artificial light. Gelatino-chloride is a "printing-out" process. Whether one process is "better" than another depends entirely upon your own requirements, and these you do not specify.

BURNETT.—1. As near as convenient. 2. By the brilliancy of the disc. 3. Yes; with sufficient exposure. 4. Not necessarily. 5. Quite. 6. A round silver burner answers every purpose. 7. An excellent plan; we should, however, recommend artificial light on account of its invariability.

AVONDALE.—Are you sure that the oxalate of potash you have used is all right? We should advise you to procure a fresh sample from another source, and supposing the paper has not been allowed to absorb moisture, if that does not get over the trouble, send samples of the failures to the makers of the paper.

F. PEEL says: "To-day I developed a negative, and to my astonishment the subject came out reversed—that is, what was on the right-hand side came out as if it had been on the left. Can you in any way account for the phenomenon?"—Yes; certainly. The plate was put into the dark slide glass side towards the lens.

R. ST. JOHN.—To give *full* working details on any of the photo-mechanical processes in the space allotted to this column is quite out of the question. To give full practical information on any one of them could not be done in an entire JOURNAL. Plenty of sound information on the different methods is to be found diffused through our back volumes.

NOVICE.—The preservative bath should be discarded before it begins to deposit crystals. We do not know the strength it is made, or how compounded; possibly it may become super-saturated by evaporation. There is no necessity to trest the solution with kaolin. It is better, as it is so inexpensive, to throw it away after it has been used a few times.

A. ROGET.—From the sketch, the proposed studio will answer every purpose. It is not at all necessary to have glass on both sides. If it be glazed, as suggested, it will answer every requirement. One end may be used in the morning and the other in the afternoon. The opaque side of the room should be papered, or painted, of some light neutral tint, such as a French grey or an unobtrusive pale green.

J. O. B. says: "Can you explain to me the following circumstance? When I mixed the toning bath for the Ilford printing-out paper for the first time or so, instead of getting a clear fluid, I got one which threw down a white flocculent precipitate, and refused to tone. A friend of mine got the same. I was told it was the excess of sulphocyanide of ammonia, but I don't think it is, because next time I carefully weighed it."—If the bath were prepared according to the instructions issued with the paper, and it refused to tone, there was some fault with the materials used. Possibly impure water or unclean vessels were employed.

O. A. K. says: 'I want to make lantern slides of a number of hymns, and I find the greatest difficulty in getting a good black deposit with a clear glass ground. My negatives are made on Mawson's photo-mechanical plates, and are good strong ones; a genuine black and white, quite clear of fog in the letters."—Our correspondent adds that he has tried several brands of lantern plates and different developers. He also complains of the keeping qualities of lantern plates. There ought to be no difficulty in the matter, as such slides are easy to make. Possibly the negatives, though clear, are not dense enough, though of a black and white character.

W. WRAY.—Your correspondent cannot have had much acquaintance with lenses, else would he have known that, in comparing two, the first thing to be done is to bring them both to the same angular aperture by the insertion of a suitable diaphragm in the one which has the largest relative aperture. Both the interior and exterior photographs enclosed speak strongly for the admirable covering power and definition of the lens, although it was used with full aperture, which ought not to have been the case with a lens possessing so large a diameter relative to its focus.

THE PHOTOGRAPHIC CLUB.—February 27, Monthly Lantern Meeting. March 2, *Halation.*

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—February 23 (Technical Meeting), *Retative Merits of Different Processes for the Production of Lantern Slides.*

WE are informed that Messrs. R. Field & Co. are now sealing up the rolls of sensitive paper for refilling the Watkins' exposure meter, so that the paper will keep perfectly good for any length of time in all climates.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—February 25, Members' Open Night. March 3, *A New Enlarging Lantern without Condensers*, Mr. S. H. Fry. March 10, *Collodio-bromide Emulsion*, Mr. A. Mackie.

WEST LONDON PHOTOGRAPHIC SOCIETY.—1892: February 26, Lantern Evening. March 4, Technical Social Meeting. March 11, Mr. John Howson, *New Ilford Plate.* March 18, Technical Social Evening. March 25, Mr. C. Whiting, *Useful Hints on Picture-making.* April 1, Technical Social Meeting. April 8, Lantern Evening. April 22, Mr. R. Whiting, *The Artistic Improvement of Negatives.* April 29, Technical Social Meeting. May 6, Technical Social Meeting. May 13, Annual Dinner.

BRIGHTON PHOTOGRAPHIC SOCIETY.—The next meeting of the Society will be held on Tuesday, February 23, 1892. Immediately upon the termination of the meeting, a special general meeting will be held. The following is the agenda:—To consider the deficiency, and to adopt resolutions thereon. Motion by Mr. Cansh: "That the members be asked to contribute towards a fund to pay off the deficiency." Motion by Mr. Foxall: "That this Society, known as the 'Brighton Photographic Society,' be dissolved, such dissolution to take effect immediately upon the settlement of the liabilities of the Society."

ON Monday afternoon the boys of the Liverpool Institute, Mount-street, were called together in the Lecture Hall for the purpose of presenting the honorary testimonial on parchment of the Royal Humane Society to James H. G. Wood, aged fourteen years, son of Mr. James Wood, the inventor of the "washer" called after his name, "for having, on September 1, 1891, gone to the rescue of Thomas Shields, who was in imminent danger of drowning at Milford Haven, and whose life he gallantly saved." The Head Master, Mr. Alfred Hughes, M.A., gave particulars of the rescue, and praised the boy for his pluck.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1660. Vol. XXXIX.—FEBRUARY 26, 1892.

BICHROMATED GELATINE AND ITS EXPANSIVE PROPERTIES.

In a leading article in our penultimate issue, the analogy in the behaviour of a film of gelatino-bromide of silver to one of bichromated gelatine was treated of. As the interest taken in photo-mechanical processes is increasing, we shall here point out some of the peculiarities of bichromated gelatine as regards its expansive properties. In the first place different samples of gelatines vary considerably in the proportion of water they will absorb. Some take up several times the quantity that others will, and the larger the proportion of water absorbed the greater is the expansion of the gelatine.

When gelatine is soaked in cold water, it not only expands in thickness but distends in all directions. It may be mentioned here that the temperature of the water in which the gelatine is soaked is a factor in the case. The higher it is the greater is the absorption, and *vice versâ*. By way of experiment we placed a thin flake of gelatine, of German manufacture, containing twenty-two square inches, and weighing the same number of grains, in water at 60° Fahr. After soaking for twelve hours it measured just thirty square inches, and had increased in thickness from about that of thin foreign note paper to that of a stout visiting card, while its weight had increased to 235 grains. It will be noticed that the expansion was proportionately greater in the thickness than it was laterally. The lateral expansion of gelatine is familiar to most persons, even those who have not given special attention to the subject, in the frilling of dry plates. Advantage has been taken of this, coupled with Plener's method of stripping the film with hydrofluoric acid, to obtain a patent for enlarging negatives. The plate is simply placed in a mixture which contains fluoric acid until the film is detached, and allowed to expand, when it is floated on to aother glass.

When a photographic image in high relief is required, a gelatine should be chosen that is the most absorbent of water. For, as a rule, gelatines retain their original characteristics after treatment with the bichromates, that is to say, a gelatine which is highly absorbent before treatment is proportionately so afterwards. We say as a rule, because the presence of foreign matters, such as alumina or other insolubilising substances, greatly modify the conditions; yet with a tolerably pure article it holds good. Now, if a film of gelatine, containing a small proportion of bichromate of potash, be spread rather thickly on a glass plate, and dried in the dark, then exposed to light under a negative, until a visible image is seen, and afterwards soaked in cold water, an image more or less in relief will be obtained. Those portions protected by the negative will be in the highest relief, and those exposed in the lowest. Instead of spreading fluid gelatine on glass, a thin sheet of it, such as that used by lithographers, may be sensitised and printed. When the print is allowed to soak in cold water, it will expand in all directions, consequently the image will become larger laterally, while, all things being equal, the relief will be less than in the former case.

While the image is in the swelled state it may be moulded from with plaster of Paris, or other material that does not require heat for its application. As the raised portions are still soluble in warm water, it of course follows that any substance applied hot would bring about their solution. If the swelled film is allowed to dry, the relief nearly or quite disappears; but it can be restored again by resoaking, though, perhaps, not quite to the original extent.

Supposing that the film is formed of a tolerably hard gelatine and, after sensitising it, dried at the normal temperature, the surface of the image, after soaking, will be smooth, hence a cast taken from it will be smooth also. It is quite possible, however, to so modify the gelatine with different materials, and, at the same time, varying the temperature at which it is dried, to obtain a rough or grained surface instead of a smooth one. For example, if a bichromated film on glass be dried at a temperature of 60° Fahr., and then exposed under a negative, it will have a perfectly smooth surface when swelled in water; whereas, if it be dried at a higher one, say, from 110° Fahr. to 130° Fahr., it will be found to be rough and grained. A close examination will show that the grain is a discriminating one, inasmuch as it is coarser in the deepest shadows, finer in the middle tints, while in the high lights, where the light had least action and consequently the gelatine is most swelled, there is practically no granularity at all. Upon this property are based collotype and analogous processes of printing.

It is usually explained in text-books that the collotype process is dependent upon the property of bichromated gelatine, after exposure to light, becoming more or less non-absorbent of water, while the protected parts retain their original state, so that when the ink is applied it "takes" on the film in proportion to the light's action. That is so; but it is not all. The reticulation or puckering up of the surface is an important point in the case as it becomes an ink-holding grain, which is strongest where most ink is required; finer in the more delicate portions, and almost, if not quite, non-existent in the highest lights.

By selecting a suitable gelatine, as well as further modifying it in the preparation of the plates, the collotypist is enabled to obtain a plate possessing the requisite qualities for his purpose with quite a minimum of swelling up of the film, which is an undesirable quality in a collotype plate. Hence it will be seen that the expansion properties of gelatine are subject to considerable modification when necessary.

LOSS OF DENSITY IN FIXING.

In a letter which we published in the Journal of February 5, our esteemed correspondent, Mr. Albert Levy, attributes a property to the hypo fixing bath which we do not think it really possesses. After suggesting that the makers should tell us whether their plates do or do not "lose much" in the fixing

bath, he goes on to inform us that he obviates loss of intensity in the hypo by over-development. He believes that many so-called under-exposed pictures are simply not developed enough to suit the extra loss in hypo, and that a somewhat under-exposed negative will lose much more in the hypo than a fully exposed one.

Now, density depends upon two operations, namely, exposure and development, and their product is an image of metallic silver on a layer of unaltered salt. Hitherto we have always understood that the only thing which a developed plate could lose in the fixing bath was the unaltered part of the picture. Mr. Levy, however, appears to imply that the developed silver image itself suffers removal, more or less, and in that implication he virtually attributes to hypo the property of dissolving metallic silver, since the density of the image is entirely dependent upon the quantity of the latter which has been thrown down by the developer. Probably hypo, employed at its normal strength and for a normal time, has some slight solvent action on the developed image of a gelatine plate; but, if so, it is tolerably certain that such an action is so inappreciably small as to be practically unworthy of notice in regard to the "loss" of density thereby caused.

Assuming, however, that our correspondent would not be willing to support the foregoing deduction, which, let it be remarked, naturally issues from his own premisses, some other cause for the loss of density of which he complains must be sought, and here we point out that, if hypo does not, as we submit it does not, dissolve the reduced silver of the image, there can be no *actual* loss of density in the fixing bath. We can, nevertheless, fully understand that with many plates there is an apparent loss after fixing, and the reason for this we believe to be easily explained.

In the first place, the image on a richly coated plate might, upon development, appear to have greater density than was subsequently found to be the case, simply because the thick film would lend itself to the illusion, and in such an instance, where development was stopped too soon, we can perceive how the fallacious idea might arise in some minds that the fixing bath itself was responsible for the "loss," the real explanation being that the plate was under-developed. With a thin film, on the other hand, the obstructing power of the non-actinic light would be considerably less than the thicker one, and thus this very paucity of emulsion might actually conduce to the obtainment of density by inducing the operator to carry on development until he had secured sufficient opacity, part of which, in the case of the thickly coated film, would be already provided for him.

But, in addition to thickly coated films, yet another property of gelatine plates might conceivably lead one astray in the estimation of the density of the developed negative. This is the presence in so many of the commercial plates of the present time of a certain proportion of iodide of silver, which, by its colorific property, may impart to the film an appearance of thickness, and thus also mislead one in the matter of the amount of density obtained. Iodide of silver, again, is to a great extent inert under the action of the alkaline developer, so that here, too, we may discover one of the causes of the assumed loss of density in the fixing bath.

The foregoing may possibly throw some light on the true cause of the difficulties experienced by our correspondent. That the image itself, as he seems to infer, loses appreciably in the fixing bath, we are unable to admit. The loss caused by the hypo can only be that of the unreduced salts, and the apparent loss of density is consequently in the inverse proportion of the undeveloped parts of the film. Hence it probably follows that the so-called loss of density in the fixing bath arises wholly and solely from under-development or under-exposure, or both in combination.

The Chicago Exhibition.—In our correspondence columns we print a letter from Sir H. Trueman Wood which conveys to intending exhibitors at Chicago a great deal of desirable and, at the same time, useful information in reference to their exhibits. It will be seen that applications for space should be sent in not later than February 29, after which date they can only be received subject to space being available.

Star Discovery by Photography.—The new star which has been discovered in the constellation Auriga turns out to have been photographed at Harvard in December last. The Astronomer Royal points out that it thus appears the new star had been photographed on three separate occasions in the course of the photographic mapping out of the stars, and that thus, with the aid of funds provided as a memorial of Dr. H. Draper, a photographic record of this star has fortunately been obtained two months before its recognition as a new star.

The New Hon. Secretary of the Photographic Society.—At their last meeting the Council of the Photographic Society of Great Britain appointed Mr. H. Chapman Jones, F.I.C. F.C.S., to be Hon. Secretary in place of Captain A. M. Mantell, R.E., who has resigned. We are certain that this appointment will give every satisfaction, not only to the members of the Society but also to many others who are interested in its welfare, Mr. Chapman Jones's personal and scientific claims eminently qualifying him for the position. The vacancy on the Council thus created will, we believe, be filled by Mr. Francis Cobb.

Photographic Measures of Stars.—The Astronomer Royal recently communicated a paper to the Royal Astronomical Society on this subject. This operation of measurement is by no means so simple a matter as would at first glance appear. The first point to determine was the relation between the diameter of the image of a star on the plate and the time of exposure. A large number of measurements were made with this object, and an empirical formula, for variations with a particular star, was developed for use, and, with other calculations regarding different magnitudes, a formula was obtained which, making use of the before-mentioned constant connected magnitude, diameter of image, and time of exposure.

Action of Light on Mercury Compounds.—A paper containing many facts of possible value in photography was read at a recent meeting of the London Chemists' Association. The subject was the action of light on mixtures of salts of mercury with compounds containing iodine mercurous chloride (calomel), and iodoform, decomposed red spots being produced on the sides of the bottle containing the mixture exposed to the light. With mercuric chloride ("bichloride") no action took place. Either green iodide of mercury, or iodoform mixed with the mercurous salt, quickly produced scarlet spots. Oleate of mercury and iodoform became first green, and then scarlet. In some cases, further action of light created a kind of reversal, the scarlet disappearing, and the original colour being restored. In most cases iodine was given off.

Something for Nothing.—Mr. Arthur Debenham, of Ryde, sends us a card, which was recently being delivered from house to house in that town. He says it shows the state of trade obtaining in the Isle of Wight, and adds, "What remains now except to offer a glass of grog in the bargain?" The card runs as follows: "Something for nothing! Do not miss it. Messrs. Billinghurst & Dovey, photographers, 121, High-street, Ryde, Isle of Wight, beg to thank the inhabitants of Ryde and vicinity for their very liberal patronage during the past nine months, and herewith make a special offer of

photographs gratis. Messrs. Billinghurst & Dovey will photograph any adult person producing this ticket free of charge, and give them one cabinet-sized photograph. Available any day from February 15 to February 22, both inclusive, from ten o'clock a.m. till four o'clock p.m. each day. These will be good photographs, executed in first-rate style, and sent out in rotation of taking. Messrs. Billinghurst & Dovey reserve to themselves the right of refusing to photograph any one not properly dressed, also babies and young children. Something for nothing! Read this carefully." We have carried out this last injunction to the foot of the letter, and are at a loss to understand why, if Messrs. Billinghurst & Dovey have enjoyed, as they say they have, "very liberal patronage" during the last nine months, they should have to resort to such methods as] the above for increasing their business.

Argentometer Indications.—Dr. William Ramsay, F.R.S. has been making a series of investigations on the action of particles suspended in liquids, and, in the course of the discussion that followed the question was asked whether muddy water gave a higher density than the same free from suspended particles. Mr. Friswell said it was well known that when oil of vitriol contained lead sulphate in suspension it was not possible to ascertain its density exactly; and Professor Ramsay pointed out that, as particles possessing the specific motion in a liquid which had been shown to exist exercise pressure, the result of their presence would tend to force the hydrometer bulb upwards, and thus cause an apparent increase in the density of the solution. It is, therefore, quite likely that one of the causes of the untrustworthiness of the hydrometer form of argentometer may be traced to this cause. It is, however, very surprising in how few establishments any other form is employed. There really is no need for this ignoring of a valuable instrument or method. For about half-a-crown it is possible to purchase a graduated tube, in which any schoolboy could, in one minute, gauge the strength to a nicety of any silver bath. The sample under examination is poured in the tube till it reaches a zero mark, and then, by small quantities at once, a solution of chloride of sodium of definite strength is added, till no further precipitate takes place. The figure on the tube opposite the level of the liquid at once, and without calculation, gives the grains per ounce. But even this simple instrument is not actually necessary. A definite quantity of silver bath is placed in a bottle; a two-ounce measure is filled with the salt solution, and drachm by drachm added till precipitation ceases. The bath then contains, say, four grains per ounce—or any other quantity, according to the strength of the precipitator—for each drachm of the salt solution required. It is very probable that one cause of this most valuable method being neglected is the fact that its use was originally complicated by the recommendation to employ an "indicator," that is, a further chemical added to indicate, by a change of colour, the approach of complete decomposition. This is absolutely unnecessary. In adding the chloride solution it will be noticed that, so long as all the silver is not thrown down, the flocculent particles remain suspended through almost the whole mass, and the surrounding liquid is evidently quite bright and clear; but, the moment the last particle of chloride of sodium necessary is added, the whole mass of precipitate sinks to the bottom, and the supernatant is no longer clear, but quite milky-looking.

WHY PHOTOGRAPHS FADE.

I.

At several photographic meetings lately, the subject of the fading of silver prints has been raised, and many amateurs will be in a state of doubt who to believe. On the one hand they are told that, if they print in silver (whether bromide developed prints or by the various printing-out processes), their time and money are simply wasted so far as any permanency in the results is concerned. On the other hand, they see in the advertisement pages of the journals silver printing processes said to be permanent.

Now, which is right? When one sometimes sees silver prints done thirty-eight years ago, with the whites of the picture perfectly pure, and not the slightest trace of yellowing or fading in the lightest tints—in fact, the prints as perfect, apparently, as the day they were done—one cannot but help thinking that there cannot be much the matter with a silver printing process that gave such results, and this even when the mounts had been damaged by damp.

But who produced these photographs? Ah, that is the secret, to a great extent, of the whole matter! They were done by men thoroughly well up in photographic chemistry. They used the best paper they could procure; they salted, sensitised, and prepared their *few* prints with every care. The time taken up in preparing the sensitive paper made them careful in their work at every stage. Then they altered their salting and sensitising baths, so as to obtain the best results from each one of their few negatives. A negative in those days represented time, enthusiasm, and patience. There was no "pull the string, press the button, and we do the rest" about it.

Their method of work is the only one by which any process ought to be judged, and yet we are actually asked to judge of the permanence of the various processes of the present day by the illustrations bound up in some book, probably produced, piecework, by the thousand, by a group of workpeople who would know and care as much about the permanence of their work as they would if they were making linen buttons at so much a gross.

To condemn a process under such circumstances is about as fair as the way one often hears at our Society's meetings in which a certain make of plates, &c., is condemned by some young fellow who has bought a shilling instruction book and a few dozen of plates, and thinks he is competent to give a conclusive opinion about everything connected with photography. It speaks much for the permanence of the printing processes of the present day, after seeing some of these young fellows at work, that their prints stand—I was going to say for a week.

And this brings me to the subject that is really the reason of my writing this article. How few photographers' assistants (and, in many cases, even the principals themselves) know anything of the causes that conduce to the fading and deterioration of their prints, whether they are working in silver, platinum, or carbon? It must be remembered that there is not a single one of these processes but will give prints which will deteriorate in time if proper care is not taken in their production.

Indeed, it is a grave point to my mind whether some of the manufacturers are as particular in the selection of their paper, &c., and its preparation as they ought to be. To get the best results when the prints are produced seems often to be the only thing they can think about, because they advise the addition of substances to the developer, &c., that cannot but be injurious to the prints as regards permanence. I believe it is done, as a rule, through ignorance, or, perhaps, want of thought, but it gives, or rather will give in time, their goods a bad name.

How many a photographer in a country town has had to curse the manufacturer for the ruin of his reputation through the fading of his prints, every one of them backed with the name and address of the producer.

At the same time the manufacturer and his goods are often blamed for the fading of the prints, which is really due to carelessness, or, perhaps, more often, want of knowledge of the importance of small details in fixing and washing the prints on the part of the photographer.

Perhaps a few notes which I have made during my many experiments on the subject of the fading of photographic prints may be of use to some who are at present quite unable to account for the reason of the deterioration of their prints.

As there are many amateurs who prepare their own chloride of silver printing papers since Mr. L. Clarke brought out his platinum toning process, I therefore purpose to go to the very beginning, namely, the paper before and after it is sensitised and follow on during the succeeding processes to the production of the finished print, and at each stage try to show how causes may arise to account for the fading or, at least, deterioration of the prints in a few years.

HERBERT S. STARNES.

AMERICAN NOTES AND NEWS.

Our Coming Convention.—And here *place aux dames*. It is somewhat gratifying to know that our United Kingdom Convention is sufficiently recognised by our Transatlantic *confrères* as to influence at least some of them in selecting the time of their visit to Europe. From a letter received from Miss Catherine Weed Barnes, Associate Editor of the *American Amateur Photographer* and *Outing*, we learn that our accomplished sister is arranging the duration of her intended visit to this country so as to embrace her participating in the pleasures of the Convention to be held in Edinburgh in July. It is altogether unnecessary to say that she will receive a most cordial welcome, both on account of her own acquirements and as repre-

senting photographic literature and art of a country which permits adies to occupy, like cream on milk, a high position.

A Law-suit Terminated.—We understand that the suits between the Celluloid Company, of America, and the Eastman Company, of Rochester, have now been satisfactorily settled in the interests of both parties.

A Specimen Letter.—The Scovill & Adams Company recently received the following letter: "Please send me one of those woden thing that wholes the lense to the Camera on the Scholars outfit i broke mine someway I don't know how. Yours truly R. S. P.S. Enclose 5c. if it is to much let it go & if it is not enough write & i will send you the ballance." Even in these enlightened days we ourselves not unfrequently receive communications equal in opacity to this.

An Edition de Luxe.—We have once or twice said that the Americans know how to engrave, and how to get up a book in an attractive form. It is not for us here to speculate as to the causes which have operated to conduce to this, but so it is. Of the various handsome books which America has produced, we question whether any has been issued which surpasses the *édition de luxe* of the last *American Photographic Annual* (Scovill & Adams Company, New York). Special paper, special ink, and special binding, it forms, quite apart from the merits of its contents, a book that in its get-up has never been surpassed.

Exhibition at Boston.—The fifth annual exhibition of the Photographic Society of Philadelphia, the Society of Amateur Photographers of New York, and the Boston Camera Club, which is open to all photographers, American and foreign, will be held under the auspices of the Boston Camera Club, at the galleries of the Boston Art Club, May 2 to May 11, 1892, inclusive. Mr. J. Herbert Seaverns, of 5, East India-avenue, E.C., will act as the English forwarding agent for the exhibition, full particulars of which may be obtained from Mr. George M. Morgan, Chairman of the Committee of Arrangements, 50, Bromfield-street, Boston, Mass.

Destruction of Silver Prints.—Discussing Mr. T. Bolas recent theory as to the fading of bromide prints by sulphuretted hydrogen, caused by keeping the prints in a damp place, our contemporary, the *Photographic Times*, remarks: "This is not quite correct. The image is not destroyed; it exists as silver sulphide, and may be revived." Probably; but we can understand that, if the prints be mounted in a book, and the paper of that book be damp, the sulphate of calcium in the paper, together with the organic matter also therein contained, may so react upon the silver sulphide originally formed as to cause the latter to diffuse throughout the book. In that case the image would not easily be restored. We believe that, on the occasion referred to, Mr. Bolas alluded to some such hypothesis in the course of his remarks.

Should Amateurs Sell their Pictures?—The Newark Camera Club held an exhibition the other day, and the visitors were given the opportunity of buying copies of such pictures as took their fancy, the money so obtained being devoted to defraying the expenses of the exhibition. Some of the local professional photographers took exception to this procedure, asserting that such sales injured the profession—the vendors, of course, being amateurs. But suppose the amateur's pictures were better than the professional's? And, whether they were or not, would anybody argue in favour of the prohibition of amateurs selling their pictures if opportunity offered? To do so would, we fear, be productive of considerable ridicule. The only remedy is for the professional to "go one better" than his amateur rival in the quality of his work. At present it is too often the other way. *Hinc illæ lachrymæ!*

Philadelphia Society's New Rooms.—We read in the *Public Ledger* an account of the recent opening of the Philadelphia Society's new room in the presence of a large assemblage of invited guests. The apartments consist of a commodious meeting and exhibition room, admirably arranged and adapted for the purposes in view; a reading room and library, well supplied with comforts, and a stock of books and magazines pertaining to photography in English and other languages, and a fully equipped working department, including dark rooms, &c. All are suitably fitted up, and furnished with modern appliances. The copy of our contemporary which brought us this item of information was stamped "Rescued from the wreck of the s.s. *Eider*," the unfortunate North German liner which went ashore off the Isle of Wight the other week. The paper had evidently had a good soaking of sea water, but the print was unimpaired.

Negatives for Enlarging.—Dr. Elleralie Wallace, in an article, "Negatives for Enlarging" (*American Journal of Photography*), gives it as his opinion that, with snap-shot exposures by the hand camera, in the case of animals, sharp results can only be expected when a finder, the duplicate of the lens used for making the picture, is employed. The focussing of landscapes is a very easy matter; but for all work of this nature, that is, for subsequent enlarging, it is advisable to have a stand of some sort to keep the camera steady. As a developer for such negatives, he favours an admixture of eikonogen and hydroquinone. Eight ounces of distilled water are heated to boiling point, five drachms of sulphite of soda are then added. When dissolved, forty-five grains of eikonogen, and fifteen grains of hydroquinone are added. When cold, the mixture is made complete by the addition of ninety grains of carbonate of potash, and for use it is diluted with an equal volume of distilled water.

Photography and Billiards.—The Lynn Camera Club has added a billiard table to its attractions, and the editor of the *Photographic Times* endorses the club's action. So far, so good; but our contemporary goes on to say that "One of the reasons why the English camera clubs are so popular is that they unite with the photographic attractions of their club rooms social attractions as well. Some of the leading clubs are not only provided with billiard tables, libraries, and reading rooms, but have well-furnished gymnasiums," &c. This is the first time we have heard of gymnasiums in connexion with photographic clubs, and we only know of one of the latter which boasts of a billiard table. We also learn that "the consequence is that the English camera clubs take the place to a great extent of other clubs." Oh, come now, good *Times*, who told you so? Again we say, this is the first time we have heard it; but there, as Mrs. Gamp observed, "What I knows *I* knows, and what you knows *you* knows."

Beauty and Temperament.—Instituting, in *Wilson's Magazine*, a comparison between so-called beautiful women and children, Mr. G. C. Rockwood, in speaking of what is expected of the photographer, says that mature beauty is often temperamental and not physical. With the children, everything is different. They are natural, tractable, and the impossible is not expected of artist or photographer. An adult, in sitting to the artist, endeavours to assume the expression he or she desires to wear in the picture. Few artists can divert her mind from the fact that she is being recorded. A child knows nothing about expression, has no vanity or desire to look its best. No man can make a speciality of children; the children must make a speciality of him. It's a pure case of selection or Nature's ordination. The children must love him. They have intuitive perceptions, and cannot be deceived by smooth words and pretty gifts, any more than the animal. They know their affinities by a nicer, surer test, which they cannot express.

Composite Photography.—We entirely sympathise with that veteran artist, Mr. Abraham Bogardus, who, in the *St. Louis and Canadian Photographer*, asks: "What has become of Composite Photography? During the excitement attending its short-lived popularity, I wrote my opinion of it for a New York daily paper. I characterised it as the most ridiculous nonsense to which photography had ever been applied. How any man of ordinary intelligence, or one

who had ever been accused of having brains, could have been induced to advertise and recommend a thing so utterly devoid of common sense and truth, is more than I could ever understand. I think it is very dead. It certainly keeps out of sight, and I hope it is buried so deep that it will not be resurrected." In this latter respect Mr. Bogardus is wrong; the artistic nuisance is not out of sight, and it is not buried. In an illustrated American paper we saw a few days ago there were numerous vile composites, composed of the forehead and eyes of one public character, and the nose, mouth, and chin of another—offensively patched together. And one of the newest of the new school of periodicals, the *Idler*, seems to depend exclusively for such popularity as it may attain upon a few examples of composites.

A Model Camera Club.—The St. Louis Camera Club have just completed their new quarters in the club house at 911, N. Vandeventer-avenue, where they will gladly welcome visiting members of foreign clubs. The quarters are provided with a commodious dark room, furnishing ample room for eight persons to work at once. It is equipped with electric lights, shielded by ruby, orange, and ground glass, giving an abundance of safe light by which to carry on work. All necessary chemicals for development are kept on hand for the *free* use of members in the rooms. The reading room is supplied with the best journals. The rooms are all heated by steam, and are therefore always comfortable, even in extreme cold weather. The gallery is properly arranged with a suitable skylight, and has attached to it another very comfortable dark room, which may be used for changing plates or for developing. It contains a good 10 × 8 copying camera, with lens for enlarging and reducing; an 10 × 8 portrait camera, with stand, &c.; also the usual backgrounds, screens, head-rests, &c. The large hall in the club house seats about 600, and is admirably adapted for lantern exhibitions, as it is lighted by incandescent lights and comfortably seated. The club hopes that their English friends who may visit St. Louis will not forget to pay them a visit; and, in making ourselves the medium of their invitation, we take leave to congratulate our St. Louis friends on the possession of such an excellent club house.

URANIUM TONING OF BROMIDE PRINTS.

[A Communication to the North London Photographic Society.]

Since I first published the results of my experiments for obtaining warm tones on bromide papers a good deal of attention has been given to the subject, both at home and abroad. I should like, if I could, to give you what I might call the whole subject of bromide toning up to date; but this would be a large order, as there are now so many methods suggested. In my first communication on this subject to THE BRITISH JOURNAL OF PHOTOGRAPHY, I expressed a hope that what I had written might lead others more experienced than myself in photographic chemistry to take up the subject and perfect the process—to complete the ship, of which I had laid down the keel, or to build another. It is gratifying to me to find that the matter has been pursued by several able workers, that many suggestions have been made for the production of these warm tones, that some others are promised us in the near future, and that, generally, the question of toned bromides has "caught on," as THE BRITISH JOURNAL OF PHOTOGRAPHY put it the other day.

VARIOUS METHODS OF TONING.

Some of the methods that have been suggested had formed the subject of experiment with me, and had been discarded before I hit upon the uranium toning method. Others—some being for the production of the tone by development direct—I had not tried. One of these, published in one of the German papers, and copied into the *Year-book*, seems to rely on the same principle as the method of development I have suggested *preparatory* to toning, the difference being that the developer is still more dilute than what I recommended. But there is another difference which takes the process quite away from what I had done. The tone is obtained by a *second* development. The first being much of the ordinary character, a weak eikonogen developer, giving a yellowish brown tone, the finished image is reconverted into bromide of silver. This is then redeveloped in daylight in very weak eikonogen, something like one-thirtieth the strength of the original developer. The reappearing image presents itself first as a peachy pink, and proceeds through different stages of warm to dark brown.

The action, of course, is very slow; I think you might set it to work in the morning, go to business, and find it not overdone when you return in the evening. This is roughly the principle which is followed, but you will find full particulars in the *Year-book*.

Another method which is promised, but which has not been publicly shown, comes from America. I saw some prints by this process some months ago, not knowing then that they were not produced by uranium toning. It is now announced, however, that the uranium, or whatever be the colour-producing agent, will be contained in paper, or rather in the emulsion. This forms the subject of a patent, and no doubt it will prove a valuable one. The prints I saw were very fine in colour. Yet another method is promised us by my friend, Mr. Haddon. He is said to employ a salt of copper, but I have no information on the subject beyond what was stated in the brief notice in the BRITISH JOURNAL OF PHOTOGRAPHY.

The various methods that have been suggested seem to me to be hampered mostly with two drawbacks. First, as a rule it is difficult to estimate beforehand what tone it is possible to get, or to obtain the same tone at two different times from the same negative. The second is that all these methods are more or less tedious, and this would particularly apply where redevelopment was resorted to. The perfect simplicity of the acid uranium method of toning, the variety of tones obtainable by it, and the power of getting the same time after time, has always appeared to me its special charm. You may be going over your collection of bromide prints, and one may strike you as being too cold for the class of subject. In a few minutes, if your laboratory contain the necessary stuff, you can judge of its appearance in sepia or a warmer brown. If it pleased you better as it was, pop it into running water, and in a couple of hours you will have it as it was.

WORKING OF THE ORDINARY URANIUM TONING PROCESS.

As regards the working of the process, for the benefit of those who may not have heard or seen it described, I will run rapidly through it, but I really do not think that there will be much to add to what has been already published. The first thing, of course, is to get good negative. One made with lantern-slide work and enlarging in view will save you a lot of trouble. Dense negatives require long exposures which are difficult to estimate, and seldom, with that, give soft results, develop ye ever so skilfully. As to exposure, the effect you wish to produce will have to be taken into consideration, but, in any case, I recommend a liberal exposure. A print that develops very brilliant—one that has been a little under-timed—will not tone well to the sepia or warm brown. It will be apt to look hard. For red chalk tones, however, which I will allude to hereafter, a stronger print should be produced. But for the present, we are dealing with the sepia and warm browns. A full exposure should, therefore, in my opinion, be given. The developer, again, should be made up to suit exposure and effect desired. I have recommended a dilute hydroquinone developer—say, one part of the mixed solution with two parts or more of water added; or, to put it otherwise, one part each of what we are in the habit of hearing called Nos. 1 and 2, or A and B, and four or more parts of water added.

This will not give a good black and white print. With slow Ilford paper it will give, in some cases, a very fair sepia, but generally a dirty brown. This brown image is the most amenable to the after-toning. With rapid papers you do not get this colour. In using them, you must expose and develop so as to get a soft grey image with full gradation. I don't mean the flat grey image resulting from over-exposure. The difference between the slow Ilford and any of the rapid papers under development is remarkable. With the recommended full exposure and dilute developer the image on the slow paper first makes its appearance in a yellowish fawn tint, getting redder as development progresses, and passing on through brown to what appears to be black by canary light. After fixing, this apparent black turns out to be a brown. This is my experience most markedly with hydroquinone, and not so much with para-amidophenol. This yellow and brown appearance during development has made me conjecture that the slow paper might be a chlorobromide. I have used a sample of para-amidophenol, which was kindly given me by Mr. Sargent, for some trials, and found it very suitable if sufficiently diluted. The development was slow. For producing good black and white bromides, however, it is not necessary to use it so dilute, but, as the development is very rapid, only the correct exposure is any good. It gives beautifully clear results.

A DEVELOPED BROWN IMAGE NOT A NECESSITY.

The brown image got by development is by no means a necessity, as the BRITISH JOURNAL seems to make me insist. I have only *recommended* it, when working with hydroquinone developer, as being more suitable for receiving the after toning. What, however, *is* necessary is that a soft and harmonious image be produced. Since the introduction of the

phenol developer I have found it very useful for this purpose, and have used it in the form of rodinal almost constantly in place of hydroquinone. It gives a print of great delicacy of a soft grey tone, and may be diluted for that purpose to from 1 in 100, to even 1 in 400, according to the strength of the negative from which you are working, and the effect you wish. Of course, diluted so much as the last figures, rodinal would be useless for producing black and white prints. They would be much too flat, but such an image, you must remember, gives very often an excellent toned print, as the toning agent has a decided intensifying effect.

The prints are, of course, fixed in the usual way, and the after-washing must be very thorough, as the least trace of hypo produces a red stain the moment it comes in contact with the toning bath. "Tae mak' siccar," as we say in Scotland, before toning, I treat the print for five minutes in a bath of—

Peroxide of hydrogen (20 volumes)	1 part.
Water	40 ,,

and wash again for five or six minutes.

The toning bath may be conveniently made up of the following strength:—

Glacial acetic acid	10 minims.
Potassium ferricyanide.....	½ grain.
Uranium nitrate	½ grain.
Water	1 ounce.

This will not act too rapidly. It may, of course, be made stronger if desired, and I do so on occasions. The prints quickly change colour, the sepia stage being reached in a couple of minutes, and five or six minutes, as a rule, being sufficient to get the warmest brown you would care for. If carried on, the toning will continue till it reaches a heavy black red, and until recently this was the nearest I could get to the chalk-red or Bartolozzi print tint. Within the last few weeks, however, I have discovered a mode of getting much brighter red tones, and this I will describe presently. The toning action may, if you like, be carried on some shades beyond the colour it is intended to finish, and the final determination of the stopping point left till the next stage, the washing. But this over-toning, again, is by no means a necessity, although it has been suggested that I have insisted upon it, and that I thereby erected a barrier to its simple working. The print may be taken from the toning bath as soon as the desired colour is reached, for the necessary after washing is so slight that very little reduction will occur.

Washing, Drying, and Finishing.

The coloured image, or rather the coloured deposit on the image, however, is very soluble in water, so that any *too great* redness can be easily got rid of simply by continuing the washing a little longer. When the print leaves the toning bath, the high lights are of a lemon yellow colour. Five or six minutes in running water will be sufficient to remove this, and the print is then ready for drying and finishing. If it be, however, still warmer than is desired, the washing will be continued till the colour has reached almost what is wanted, some allowance being, of course, made for a little darkening in the drying.

This point being reached, it is important that the print be blotted off in clean blotting-paper or calico till it is surface dry, as, if the moisture be left in patches on the surface, there will be inequality of tone when the paper is dry. This forms a decided drawback to the use of uranium as a toning agent for lantern slides, as it would be sure to spoil a slide to blot it surface dry, unless there is some absorbent substance that could be used for the purpose that leaves no woolly stuff behind it. The use of spirits to expel the water will, no doubt, obviate this difficulty. The omission of the blotting off in the case of paper prints has been the cause of a good many failures which have been referred to me by correspondents. To produce a set of prints, all of the same depth of colour, blot off one at the required colour, and set it on a glass plate, or any other clean support, at the side of your washing tank, blotting off the others, one by one, as they reach the same tint.

I may just add a word here as to the mounting of prints. Some enlargements have been submitted to me in which the tone has been considerably reduced at places. This is caused by the prints having been wetted on the surface by the mountant, and allowed to dry in that state. After mounting I always run the print over with a sponge just damp, and in that way secure equal moisture on the surface and even drying.

Chalk Red or Bartolozzi Effects.

This, I think, brings me to the end of the ordinary toning process. It has taken a lot of telling, but in practice ten minutes will do the toning and washing for a print in warm brown. I have now to speak of the chalk red or Bartolozzi print colour. To produce this the procedure is very little different. Development should be carried further so that the faintest details are decidedly out, as the strength of the picture will depend altogether on the colour deposit, the unchanged silver being removed afterwards. For this colour it is advisable, also, to produce pluckier prints than are used in the brown process, as, if too soft, your deepest shadows are apt to look weak after the silver is removed. When this fully developed image is toned for a considerable time it will have attained a black-red appearance, as shown in the left hand section of this print. This appearance will present itself in fifteen to twenty minutes, but is desirable to let the action go on for an hour, as, at first, the colour deposit is only on the surface, and if the unchanged silver underlying this be then removed the whole of the force in the shadows would be lost. When it is judged that the tone has penetrated the deepest shadows the print is washed in running water for five minutes, or till the acid is removed, and is then immersed in a bath of Farmer's reducer. All the black heaviness dissolves out, and you have left something approaching a red chalk drawing. The hypo is now to be got rid of, and to effect this as speedily as possible I again resort to peroxide of hydrogen. A couple of minutes' washing before immersion in this bath, and five minutes after washing, will have freed the paper from the hypo. The immersion should also be for five minutes. If the high lights now seem to want clearing continued washing will have the desired effect, or, if you are impatient, add a little alkali to the water, and it will reduce quickly enough. If you use washing soda for this, or any other alkali in crystals, see that these are all dissolved before immersing the print, as, if any crystals touch the paper, the colour will be removed from the spot in contact almost at once.

For a dark green colour, which would give something of a night effect to a seascape, it is only necessary to place a toned print in a very weak solution of perchloride of iron and hydrochloric acid; but this I call playing pranks. I must warn you that it is rather fluky, and you may get a bright blue instead of a green.

I will not say more upon the chemical action involved in the uranium toning process than that a theory has been put forward by Mr. Levy, of the Photographic Club, in which he suggests that the ferricyanide of potassium combines with the silver image and forms a ferrocyanide of silver, with which the uranium nitrate enters into combination. I am not aware whether chemists accept this as the correct explanation, and no doubt the subject may still be forming the subject of investigation. It has, however, been proved by Mr. Haddon that there is no loss of silver when the toned image seems to have been washed away by long subjection to running water. Although a bright red-toned print—one, of course, from which the silver *has not been removed* by Farmer's reducer—may be washed out to a mere ghost. This ghost may be revivified by conversion into bromide of silver, exposure to light, and redevelopment, and may be again toned to any desired colour.

Mr. Haddon's Suggestions.

I have now described the process as I am in the habit of working it myself, and at this stage I wish to express my thanks to Mr. Haddon, of the London and Provincial Association, for his recent communication as to a means of improving the working of the uranium toning process. This is the first outcome of the appeal I made for help more than a year ago, for although many have tried to put forward other methods of toning bromides, Mr. Haddon has been the only one to make any practical suggestion for the improvement of the uranium method. The suggestions made by that gentleman were three: First, that by using an acidulated washing water the loss of tone in clearing the print would be done away with. Second, that by increasing the quantity of uranium nitrate to about five times the amount of the ferricyanide, the precipitate of ferrocyanide of uranium in the toning bath would be avoided, and a saving of precious metal effected; and also that the bath in that condition would be of good keeping quality. The third suggestion had reference only to the chalk red process. To avoid the reduction which may occur in removing the hypo used in that process, he suggests that the silver can be removed from the print by the substitution of sulphocyanide of ammonium and ferricyanide of potasium in place of Farmer's reducer.

To deal with the last suggestion first, I may say at once that I have not yet tried it. But it occurs to my mind that the sulpho-cyanide will have to be removed from the paper in the same way as the hypo, or if it be left without more than a few minutes' washing, I would like some one who knows to say whether its retention in the print would not set up some combination which might endanger the print. As regards this suggestion, I would say that the difficulty it is designed to obviate is more imaginary than real, as those who will practically work the process will immediately see, The red image, from which the silver has been removed by Farmer's reducer, is sufficiently hard to wash out as to be very little affected by the amount of washing required to be done in the way

I suggest. The full development of the image, in the first place, is not, as suggested by Mr. Haddon, for the purpose of allowing for washing out, but for the purpose of getting decided strength in the weakest detail, as they, when toned and the silver removed, would naturally look weaker in a faint red than they do in the original grey. By using the peroxide of hydrogen the hypo is so quickly eliminated or decomposed that there is little perceptible reduction in tone, and I have not found any one to positively state that the prints will suffer from the hypo eliminator if they have five minutes' washing in running water after they are removed from it.

Comparative Experiments.

Now, as regards Mr. Haddon's suggestion to wash after toning in water acidulated with acetic acid, with a view to removing the yellow stain without reduction of the tone, I have made a comparative experiment to illustrate to you the advantage or otherwise of this suggestion. I submit to you a print which has been toned to a red-brown colour, and from which section "A" was cut off and thrown into running water, and there remained for nine minutes, and then blotted off and dried. Sections "B" and "C" were washed in thirteen changes of acidulated water over a period of sixty minutes. Section "B" was then cut off, blotted, and dried, while section "C" was thrown into running water and washed for seven minutes, and then dried.

It will be observed that the yellow stain is not removed from "B," although it has been treated with constant changes of acidulated water for an hour, and that it is only when it has received a further washing of the usual time in plain water that the print is cleared. In the gaslight this is not so apparent as it is in daylight, but you can, I think, clearly see the marked difference between "B" and "C."

Now, on comparison of "B" and "A," it will be observed that "B," which was treated with acid, has decidedly suffered less loss of tone than the section treated only with plain water. This latter, however, I may say, received four minutes more washing than was absolutely necessary to remove the yellow stain, while "B" was removed from the water the moment the stain was sufficiently removed to make the high lights match with those of those of "A." On the whole, I admit an advantage for this suggestion; but it is so unimportant, and obtained at the expense of an extra expenditure of time, that, in my own practice, I shall probably content myself with the old method.

And now I come to the suggested alteration in the proportions of the constituents of the toning bath. This alteration is, no doubt, based on sound theory, and it is too soon yet to say whether, in actual practice, it will not result in some improvement. My experiments, however, so far do not give me such satisfaction as I anticipated from Mr. Haddon's suggestion. As you will observe from the bottle of solution I submit to you, and which has been made up according to the formula given, and used to tone four half-plate prints, there is not that absence of precipitate which was anticipated. There is, in fact, more precipitate than in a bath of the old proportions which has done nearly double the work. It may be urged, of course, that the one contained ten times more uranium at first than the other, but it was with a view to retaining that uranium in solution that this great increase was made. If the alteration be advocated on the score of economy, I think it is very doubtful if the aspirations of its proposer will be realised. The altered bath costs ten times more than the one made by my formula, and, even at that, is not a very ruinous affair, but when it is considered that an eight-ounce toning bath, made by my formula, will cost for uranium nitrate (2s. 4d. per ounce) exactly one farthing, it is scarcely worth while saving it after it has been used for a few prints. I should think it will be less trouble to put it down the sink. As to the keeping quality of the bath (Mr. Haddon's), my experiments are satisfactory. After keeping for eleven days, I toned a print (the fourth) in quite as short a time as was required for the third. The precipitate, however, further increased, and it is questionable if it will keep sufficiently long in use as to do the same proportion of work as could be done by ten fresh baths of the original composition. I have tried a bath of the altered proportions, diluted to the same strength of uranium as my formula; but, although it tones at first exactly the same as mine, it rapidly deteriorates. I have put on the blackboard a table showing the comparative time taken to tone six prints in succession at intervals of half an hour in each of the two baths, from which it will be seen that, whereas the first prints in each were toned to a standard colour in five minutes, the sixth prints took respectively twelve and thirty-two minutes.

Table of Results.

These two baths were again tried eight hours later, when the old bath toned its print to the standard tint in eight minutes; whilst the new diluted bath was found to be practically inert. Upon adding, however, sufficient ferricyanide to bring it up to the same composition as my formula, it toned a print in five minutes, and the amount of precipitate, as you will observe, is very slight indeed. No doubt it will do its work all right still, after a further lapse of forty-eight hours. We will probably try it when giving the little bit of demonstration with which I now propose to conclude this paper.

The toning bath, made by the original formula, and used for toning ten half-plate prints, was tried again, after a lapse of eleven days, and found to be practically useless. It took thirty minutes to produce the standard tint, but, as I have said, when it has done a fair amount of work, we can afford to throw it away.

The following table will show the relative rate of working of the three baths. The time taken to tone a print to a standard colour is stated in minutes:—

Uranium Nitrate	5 grains.	0·5 grain.	0·5 grain.
Potassium Ferricyanide	1 grain.	0·5 grain.	0·1 grain.
Glacial Acetic Acid ...	30 minims.	10·0 minims.	10·0 minims.
Water	1 ounce.	1 ounce.	1 ounce.
	Mins.	Mins.	Mins.
Print No. 1	2½	5	5
" " 2	3½	5	5
" " 3	5	8	13
" " 4 Eleven days later	5		
" " 4	... ...	10	15
" " 5	... ...	10	20
" " 6	... ...	12	32
" " 7 Eight hours later	... ...	8	Bath exhausted.*

J. Weir Brown.

CARBON PRINTING.†

Stages of the Process.

Carbon prints may be divided into three stages. Suppose that the requisite number of pieces of tissue have been exposed on the negatives:—

1. They are slightly soaked in cold water and squeegeed down upon some temporary support for development.

2. After remaining for a time in contact under slight pressure, the tissue and supports are placed in warm water, and when thoroughly soaked the outer skin of paper is pealed off and thrown away, leaving, the print of the face of the support, but buried in a mass of dirty gelatine, which has to be washed away to expose the true prints, and which, when cleansed from all insoluble gelatine, shows a reversed print on the temporary support. This is placed in a solution of alum, to harden the gelatine and extract any trace of bichromate which may be left on the film. This shows a perceptible tint in prints developed on a flexible support, but is almost invisible when working on opal glass. After a wash in water to extract alum, it is dried and completed.

3. The reversed image has now to be transferred to its final support of paper, or any other material which may be desired. The print on the temporary support and the paper for transfer are placed in warm water and brought into contact, squeegeed together and allowed to dry spontaneously, when the picture will leave the support of its own accord and become firmly attached to the paper, and is ready for mounting in the same way as any ordinary silver print.

That is the process known as the "double transfer;" but where reversed negatives can be made, or ordinary negatives can be stripped from the glass and printed from the reverse side, or where film negatives are used, the process is more simple and expeditious, because the tissue can be squeegeed at once upon its final support-paper, and when developed and dried it is finished; but in such case the gelatine is exposed on the surface of the print, and the general effect is a glazed surface somewhat resembling lightly albumenised paper, and you fail to obtain the perfectly matt surface which results from the double transfer upon smoothed opal or ground glass, which has been previously waxed, when the print shows a softly grained matt surface, which is exceedingly like the face of a platinotype print.

The final result, as regards face of print, depends entirely on the surface of the temporary support. If such support is a sheet of polished glass,

* On the addition to this bath of a quarter of a grain of ferricyanide of potassium per ounce of solution, a print is toned five minutes. This, no doubt, proves the value of one of Mr. Haddon's suggestions, and that by the addition of the ferricyanide little by little the last trace of uranium in the bath may probably be utilised.

† Continued from page 122.

previously waxed and coated with collodion, the result will be a highly polished enamelled print; but if, as I shall show to-night, the support used be of smoothed opal glass, the result is a beautiful matt surface, and I consider that there is no form of carbon printing which is so convenient to work and so delicate in finish as this, and that it fully repays for the slight extra trouble of working the double-transfer process.

Of course, the tissue can be squeegeed at once upon opal glass, developed, and dried upon it, and thus becomes a fixture, which can only be got off by some grinding process, but will be a reversed print, unless it is developed on some flexible temporary support, such as is supplied by the Autotype Company, and then transferred to the opal.

I will now proceed to the first portion of the process, and attach to the opal glass the tissue I have exposed to-day, and, whilst the water bath is being raised to the necessary temperature, I will make a few more remarks.

A Critical Point.

Note that there is just one critical point in this attachment to the opal. It is necessary to watch very closely the state of expansion of the tissue. If squeegeed down too soon, it will not lie flat, and if left to soak too long the adhesion will not be perfect, and is apt to strip up and come away from the support in taking off the paper, or in development. If the dry tissue is fairly dry, on contact with the water it has a tendency to curl inwards towards the gelatine; as it absorbs moisture it flattens out, and if left long enough will eventually curl outwards, but it must be taken at the moment when it is just flat enough to lie evenly on the support, and before it curls outwards, when the attachment is perfectly safe for the after-operation. I prefer to work in a tank of sufficient size to take two prints—one to soak the paper off, and one to go on developing, as time is thus saved. Indication of the softness of condition for stripping is seen by the oozing of the gelatine from the edges, and sometimes of blisters forming between the paper and support; but care must be taken not to attempt to strip it too soon, or the print may be lifted from the support and spoiled.

The Autotype Company, in their *Manual*, advise the temperature of the water for development to be raised to 100° to 110°. This may be all right for tissue, which is attached to a final support of gelatine paper, as the adhesion is very strong; but, in using a fine-grained waxed support, I find a great risk of blistering the tissue, and that a temperature of 96° to 100° is much safer and better, though somewhat slower in action; but I find it produces better half-tone, as there is less tendency to boil away the delicate skin of gelatine where it is at its thinest texture, viz., in the high lights and lighter half-tones.

90° is described on the thermometer as "warm water," and 106° as "hot water," and I find it becomes unpleasantly hot to the hands inside of indiarubber gloves when it gets up to 110°.

(To be continued.)

A NEW LANTERN MICROSCOPE.

By courtesy of the London Stereoscopic Company, we have had an opportunity of inspecting a new projection microscope, invented and made by Mr. R. G. Mason, which should be welcomed by science teachers, lecturers, and all who use the microscope for lantern projection as well as for ordinary direct examination of either opaque or transparent objects. We have been furnished with a comprehensive account of its construction and uses, from which it appears that it is not only a lantern microscope, but possesses the advantage of being instantly, and without loosening a screw, convertible into a student's instrument for table use.

When adjusted for projection work, the microscope consists of a brass tube, with screw to fit the flange of an ordinary optical lantern. Inside this slides another tube, carrying at one end a parallelising lens, and at the other the sub-stage condenser; this can be slid to and fro, so that the object can be illuminated as desired.

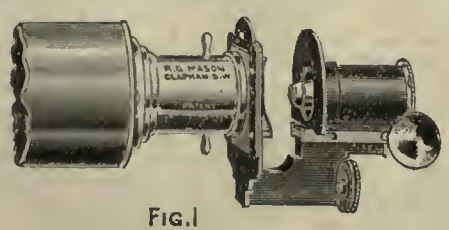


Fig. 1

In the instrument under notice an addition has been made in the shape of a polarising apparatus, by means of which the Nicol's prism may be rotated entirely by means of a milled head fixed at the side. A fixed stop indicates when a complete revolution has been made. An extra socket is supplied to hold the second prism in front of the objective, and this has also an indicator, to show the amount of rotation. The sub-stage condenser is of the standard size, and the fitting is, therefore, available for use with any sub-stage appliances the student may already possess. The stage is furnished with the ordinary wheel of diaphragms and a neat and practical object-clip of entirely novel construction, the arms being lifted by pressure on a small thumb-piece, while the object, which may be a thick zoophyte trough or a thin piece of paper, is slipped under them.

When great magnification is required while using a low power, an amplifying lens is used, mounted to slide into the front of the objective carrier. Two kinds, suitable for projection and photo-micrography respectively, are issued with the instrument. For photo-micrography nothing more is necessary than to fit the instrument to an ordinary camera, supported in any convenient way. The milled head of the fine adjustment has a deep groove cut upon the edge, so that a small band may be placed upon it and connected with a grooved wheel and rod running under the camera, to permit of accurate adjustment on the ground glass.

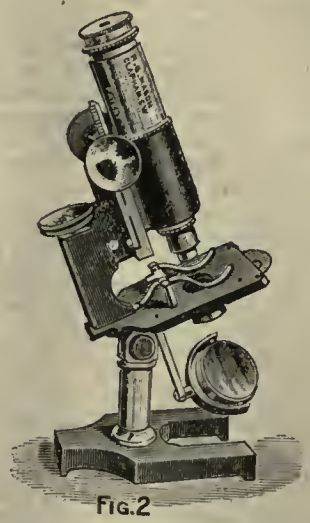


Fig. 2

When required for use as a table microscope, the stage is slipped off it lantern attachment and slipped on to the foot, which is of the ordinary pattern. The way in which this is done is very simple; the stage is, so to speak, split into two layers, one of which is permanently attached to the lantern fitting, and an exact duplicate to the table stand which carries a standard sub-stage fitting; the other layer, which is really the stage proper, is fixed to the body of the microscope in the ordinary way, and can be slipped into grooves in its counterparts for either purpose. These grooves, as well as all other working parts of the microscope, are compensated, so that with fair usage it is almost impossible for wear to impair its usefulness. The rack of the coarse adjustment is spiral, so that there is always contact during movement, while the fine adjustment is made with the usual very finely threaded screw. The draw tube permits of extension to the full English length, and can be so placed as to permit of a four-inch objective being used, if desired. Any objective may be used, but Mr. Mason prefers to supply a special form, which, while having large aperture, gives sharp and clear definition to the edge of the field.

ELEMENTARY NOTES ON PHOTOGRAPHIC LENSES.*

Flatness and Curvature of Field.

Flatness of field is the power of bringing the rays from equally distant objects to a focus in a true plane. No lens is perfect in this respect, the margin of the picture being well defined nearer the lens than the centre, as in diagram 5, the curve representing the points of greatest sharpness. If the field were absolutely flat, the marginal ray would be as shown in dotted lines.

To test or compare lenses for flatness of field, arrange the camera so as to have some well-defined object, such as a leafless tree, in the centre of the plate; then, when this has been focussed as sharply as possible, make a pencil-mark on the moving part of the baseboard, and then revolve the camera on the triped-head until the same object is seen at the edge of the plate, when it will be decidedly out of focus. Refocus, and make a second pencil-mark, the distance between the two being the curvature of the field. This is one of the points in which the greatest

* Continued from page 126.

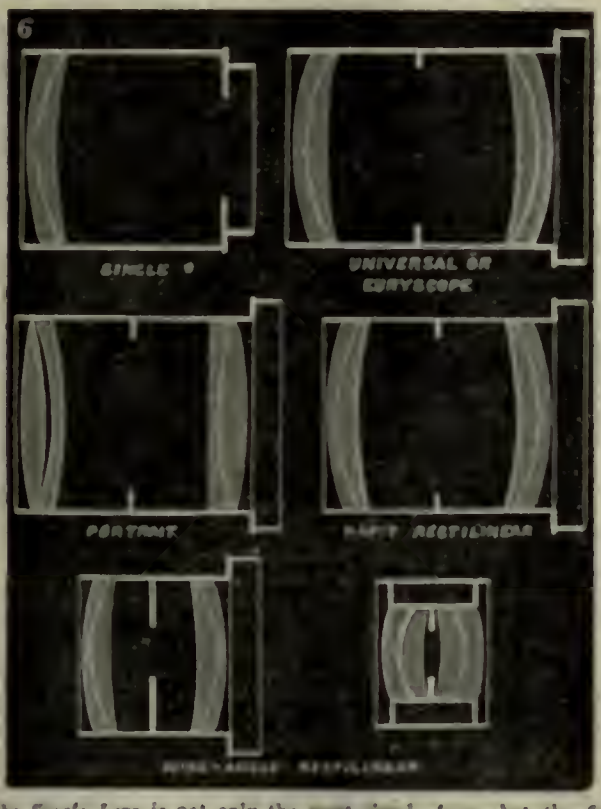
difference exists between good and inferior lenses, some having fully double the curvature of others.

This curvature of the field may, in some instances, be utilised, and almost amount to an advantage. In photographing an interior, the sides of the building being nearer the lens than those parts forming the centre of the picture would be, as I have previously shown, in sharp focus

farther from the lens, or beyond the curve in the diagram, either between the curve and the plane, or even on the plane itself, as shown by the dotted lines. In taking groups or subjects within the photographer's own power of arrangement, knowing that this defect exists, the sitters near the ends should be placed rather nearer the camera than those in the centre, when it will be much easier to get all the faces well defined.

The Single Lens.

Sections of the principal types of lenses are given in diagram 6.



The Single Lens is not only the most simple form, but the finest possible for landscape work. It consists, generally, of two glasses, occasionally three, cemented together, mounted at one end of a tube, the stop being at the other. They are most frequently concavo-convex, this form being termed "meniscus," and sometimes plano-convex. The convex side is always nearest the sensitive plate, the stop being at the concave or flat side.

The great value of a single lens is that it gives a more brilliant and vigorous image than any other form. For this there are two reasons. First, being one combination only, there are fewer surfaces to reflect stray light than in others; and, second, being at the back of the tube, it is well protected from diffused light, only those rays striking the lens that are utilised in forming the image. Unfortunately, it has corresponding disadvantages, the most important being its distortion.

It is an inherent defect in all single lenses to produce a distorted image, *i.e.*, one in which true projection is not obtained, straight lines near the margin of the picture being reproduced as slight curves, as in diagram 7, the curvature being outwards as A if the stop is in its usua

position on the outside of the lens, and inwards as B if the position were reversed, or the stop inside.

While these curves are greatly exaggerated in the diagram, yet they are sufficiently pronounced to render the lens useless for ordinary architectural or true copying work where straight lines may occur close to the edges of the plate. In many instances, however, by judiciously arranging the subject so as to keep long straight lines well away from the margins, this distortion will be inappreciable. In landscapes or figure subjects, this slight distortion being of no importance whatever, full advantage may be taken of the merits of this type of lens.

Its second disadvantage is that it cannot be used without a stop, and is consequently much slower than those that allow of their full diameter being utilised for each cone of rays. By the defect known as spherical aberration, if the full diameter is used, the margins do not bring that portion of the beam of light passing through them to a focus at the same point as the part that passes through the centre, but rather nearer the lens, and so crisp definition cannot be obtained until a stop is so placed as to cause a central ray to pass through the centre of the lens only, and marginal rays through its edges. A good single lens that is well corrected for this defect will generally give fairly good definition with a stop half its own diameter.

There is an incidental advantage in this necessity for the lens being so much greater in diameter than the largest stop, the plate is very evenly illuminated, much more so than with any other form of lens.

Its rapidity is ample for most outdoor work, and for such I should strongly advise its selection preferably to any other. In many cases, beginners are taught to somewhat despise a single lens, and consider it a thoroughly inferior article to a rectilinear; they are told that "it will do to commence with, they can get something better later;" but, as their acquaintance with photography extends and their powers of discrimination increase, they will be very unwilling to substitute any other. The editor of The British Journal of Photography, an eminent authority on photographic optics, in an article on this subject, said, "Some of the finest landscapes the world has ever seen have been produced by this lens."

The Portrait Lens.

The portrait lens is, to an amateur, the most useless form possible. Originally introduced in the days of collodion, when plates were much slower than at present, its great object was to reduce the time of exposure as much as possible; but to obtain its great rapidity every other good quality has to be sacrificed. It is a double combination, a plano-convex cemented element at the front of the tube, and at the back a double convex and a concavo-convex, with this peculiarity that, instead of being cemented together as usual, there is a small air space between them. In this, as in all other double forms of lens, the stop is placed between the combinations.

Many amateur photographers have imagined that there is some unique property in a portrait lens, rendering it specially capable of taking portraits, or that they could not be taken so successfully with any other. This is a fallacy; its only advantage is its rapidity, and this is so great that it is quite unmanageable, for most outdoor work, unless considerably stopped down, and then any other lens is better.

Amateur portraits are mostly best when taken out of doors, as the softness of lighting necessary can be so much more satisfactorily arranged than in any ordinary room, and for this any landscape lens is specially suitable.

The disadvantages of the portrait lens are, the field is very round, and it has more reflecting surfaces, this last being a very serious objection. It is probably familiar to every one that, when a gas flame is reflected in a mirror, in addition to the principal image, two or more others somewhat fainter are seen, which are principally reflections from the front unsilvered surface of the glass, and multiplied reflections from the two surfaces. A similar species of reflection is constantly occurring in photographic lenses, and, though not always in the form of a visible

image, it is frequently present in a diffused form, detracting from the brilliancy of the image. In very extreme cases, such as a very dark interior, with a bright window at one side, or even a view in which one side of the plate is occupied by a dark mass of foliage, and the other by a brilliant sky, a lens that possessed this reflecting capacity very strongly marked would produce a "ghost," or faint diffused image of the bright object on the dark side of the view.

Where two glasses are cemented together, these faces in contact do not reflect—it is only the surfaces that are exposed to the air. It will be seen from the diagram of the portrait lens that it has six such surfaces, four of these being concave towards the plate, which seem to be far more active in producing these reflections than those that have their convex side towards it; and so strong is the tendency of this lens to produce "ghosts," when used with stops especially, that it is practically impossible to use it for most outdoor work.

H. W. BENNETT.

(To be continued.)

Our Editorial Table.

FLASHLIGHT PICTURE.

By J. G. HUDSON, 4, Randolph-gardens, Maida Vale, W.

AT the conclusion of the meeting of the National Association of Professional Photographers, at Anderton's Hotel, on Thursday, February 11, Mr. J. G. Hudson (of the "Kolm" lamp) took a flashlight negative of the members, prints from which are now before us. The results are most successful. Mr. Hudson informs us that he is willing to supply copies at 1*s.* 6*d.* each, and that the proceeds of such sale will be handed over to the Photographers' Benevolent Association.

MR. W. TYLAR, of Birmingham, sends us a small pamphlet of eight pages devoted to a description for beginners of the art of photographing microscropic objects. It is clearly written.

MESSRS. W. B. WHITTINGHAM & Co.'s Photographic Price List comprises within its 150 pages descriptive details of the innumerable requisites demanded in modern photography.

THE second number of the *Idler* (Chatto & Windus) contains another instalment of "Choice Blends," a series of composite photographs by Boning & Small, of not wholly dissimilar persons, such as Colonel North and Mr. Burns, Mr. Grossmith and Lord Halsbury, Mr. Labouchere, and Mr. Yates. Many of the other illustrations to the magazine are of the singular quality known as "impressionistic." They do not favour the artists, who, in their turn, have little cause to be grateful to the process of reproduction. As for the literary matter of the *Idler*, that part of it which is meant to be witty is dull and forced, and the remainder has a distinctly "spectral" flavour. Remove the big names from its titlepage, and the contents as literature, or even humour, could not possibly produce any other impression than that of the commonplace.

WE have received the ANNUAL REPORT AND PROCEEDINGS OF THE PHOTOGRAPHIC CLUB for 1891. The condensed discussions upon a great variety of subjects, which are given in the volume, are a mine of valuable information. A paper *On the Theory of Development*, by Mr. A. M. Levy, which is printed *in extenso*, is a most able examination of the subject, and its restriction to the Club's proceedings is a loss to photography.

THE OPTICAL LANTERN AS AN AID IN TEACHING, by C. H. Bothamley, is a reprint of some articles published in a contemporary. As an introduction to lanterniana, the *brochure* is all that could be desired. It is published by Messrs. Hazell, Watson, & Viney.

FROM Messrs. Mawson & Swan we have received quite a parcel of useful little publications, comprising *An Exposure Note-book*, *A Set of Labels for Photographers*, *How to make Transparencies*, *The Wet-collodion Process for Iron Development*, and the *Gelatino-bromide Paper Process*. Herein will be found a number of practical hints likely to be of material assistance to the amateur in the various processes dealt with.

ANLEITUNG ZUR PHOTOGRAPHIE FUR ANFANGER, by Captain Pizzighelli (Halle, Wilhelm Knapp), is now in its fourth edition. It is an exhaustive and practical treatise on photography, small in bulk but rich in value, and contains no fewer than 166 illustrations of apparatus.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 3014. — "Improvements in and relating to Automatic Photographing Apparatus."—H. J. B. THIROUX.—*Dated February* 16, 1892.

No. 3025.—"Apparatus for Producing Light by the Combustion of Magnesium or other Highly Luminiferous Bodies."— H. AXTMANN.—*Dated February* 16, 1892.

No. 3226.—"Improved Automatic Lock or Spring Catch for Folding Camera Tripod Stands."—A. BIANIE.—*Dated February* 19, 1892.

No. 3337.—"Improvements in Tripod Stands for Photographic Cameras."—E. UNDERWOOD and T. A. UNDERWOOD.—*Dated February* 20, 1892.

PATENTS COMPLETED.

IMPROVEMENTS IN PHOTOGRAPHIC CAMERAS KNOWN AS "DETECTIVE," OR HAND CAMERAS.

No. 4459.—JAMES W. MORGAN, 35, Princes-street, Tunbridge Wells, Kent. *January* 30, 1892.

THIS invention relates to improvements in photographic cameras of the character known as hand cameras, or "detective" cameras, and has for its object to simplify the construction of such cameras, and reduce their size, and for other purposes.

According to my present improvements I arrange and construct a camera as follows :—

The case or frame of the camera is of any suitable shape; but, for the sake of example, I will describe an oblong box or case.

The lens is, or may be, mounted on a sliding plate, sliding in grooves or bearings inside of the case, such slide being actuated in any convenient manner —for instance, by a knob or handle projecting through the case, by which also it is secured in the desired position, a pointer on such knob or handle serving also to indicate (on a scale or dial provided) the distance the lens is set for.

Any usual or suitable shutter may be used, and also any usual or suitable view-finder may be used.

The sensitive plates or films are mounted in sheaths or plate-holders, and are placed in position at the back of the camera, to which admission is gained by any suitable door or opening provided for that purpose.

All the plates when in position are pushed forward by a spring in the back of the camera, which spring is controlled by, and can be drawn back by, means of a knob, or the like, projecting through the back end or side of the camera, as and for the purpose hereinafter explained.

The front plate is thus pressed firmly up against a beading or sort of frame, where each plate in turn takes its position for exposure.

The front plate, after exposure has taken place, is then allowed to drop through a transverse slot in the bottom of the case by simply withdrawing the pressure of the aforesaid spring and shaking the camera, and the said exposed front plate will then drop through the slot into a light-tight bag or case made of any suitable fabric or material, which case is made just large enough to hold said plate, and is attached to a slide which travels in guides, or is so held that it can travel freely backwards and forwards (within a certain limit) in line with the plane of the bottom of the camera case, and in the direction of its length.

The slide with the attached bag containing the exposed plate is now slid back until the bag and slot in the slide coincide with a second slot in the bottom of the camera case; the camera is then turned upside down, the aforesaid spring at the back is again drawn back, and the exposed plate drops out of the bag back into the camera, right at the back of all the other plates, and so on with each successive plate, until all have been exposed. The bag, when out of use, lies flat against the bottom of the camera.

To indicate how many plates have been exposed, so as to show when all have been exposed, and prevent exposing by accident any of the plates a second time, I have invented the following device :—

The carrier or sheath of the last plate to be put in the camera (when filling same in the dark room *et cetera*) has a lug or projecting pin, which is inserted in the eye of a sliding dial or indicator, which it pushes forward when each plate in front is changed to the back, and through an aperture in the case successively indicates the number of the plates exposed (or not exposed, as desired), and, when it ultimately reaches the front position, and has been exposed, it cannot be removed through the aforesaid slot, as the said pin or lug prevents its dropping out through the slot in the bottom, and hence unmistakably indicates that all the other plates have been exposed.

I wish to remark that I do not limit myself to the use of any particular shutter and apparatus in connexion therewith, as any shutter suitable for the purpose may be used as desired.

IMPROVEMENTS IN AND CONNECTED WITH PHOTOGRAPHIC CAMERAS.

No. 21,605. RUDOLF STIRN, 34, Sebastianstrasse, Berlin S., Germany.—*January* 30, 1892.

THIS invention relates to a photographic camera in which the plate exchange, in contradistinction to the corresponding devices of other known cameras, is effected in the exposure chamber.

The light-sensitive plates are each arranged in a peculiarly constructed sheet-metal case or frame, and are laid one above the other in the plate chamber, separated from the exposition chamber by a partition which, in order

to permit the insertion of the plate to be exposed and the removal of the exposed plate, is at its superior and inferior side provided with an appropriate slot.

The movement of the plates to and from the exposing chamber, out of the plate chamber and back again into the same, is effected by means of two slides connected by bands running over suitable rollers, so that both slides move simultaneously but in opposite direction.

The lower slide effects the feed of the lower plate of the series from the plate chamber into the exposition chamber, and the upper slide, the withdrawal of the exposed plate into the plate chamber and deposits the same on the series of plates.

A full exchange of plates, *id est*, feeding in a plate, adjusting the same in the focal plane, and removing the same after the exposition into the plate chamber, is effected by twice operating the lower slide. The second movement of the slide effects the removal of the exposed plate, and the feed of a further plate from beneath the series of plates into the exposition chamber, which, on pushing back the slide a second time, is placed into proper focus, whilst the exposed plate is deposited in the plate chamber, and the upper slide brought into a position for removing the next following exposed plate when the lower slide is pushed in.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
February 29	Dundee Amateur	Assn. Studio, Nethergate, Dundee.
„ 29	Rossendale	Townsend-chambers, Rawtenstall.
March 1	Exeter	College Hall, South-street, Exeter.
„ 1	Glossop Dale	Rooms, Howard-chambers, Glossop.
„ 1	Herefordshire	Masonic House, Hereford.
„ 1	Keighley and District	Mechanics' Institute, North-street.
„ 1	Lewes	Fitzroy Library, High-st., Lewes.
„ 1	North London	Wellington Hall, Islington, N.
„ 1	Oxford Photo. Society	Society's Rooms, 134, High-street.
„ 1	Rotherham	
„ 1	Sheffield Photo. Society	Masonic Hall, Surrey-street.
„ 1	York	Victoria Hall, York.
„ 2	Edinburgh Photo. Society	Professional Hall, 20, George-street.
„ 2	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
„ 2	Portsmouth	Y.M.C.A.-buildings, Landport.
„ 2	Southsea	
„ 2	Walmsley	Egremont Institute, Egremont.
„ 2	West Surrey	St. Mark's Schools, Battersea-rise.
„ 3	Bolton Photo. Society	Baths, Bridgman-street.
„ 3	Camera Club	Charing-cross-road, W.C.
„ 3	Dundee and East of Scotland	Lamb's Hotel, Dundee.
„ 3	Glasgow Photo. Association	Pollok Inn, Rooms, 207, Bath-st.
„ 3	Leeds Photo. Society	Mechanics' Institute, Leeds.
„ 3	London and Provincial	Champion Hotel, 18, Aldersgate-st.
„ 3	Oldham	The Lyceum, Union-street, Oldham.
„ 3	Tunbridge Wells	Mechanics' Inst., Tunbridge Wells.
„ 4	Bristol and West of England	Rooms, 29, Berkeley-sq., Bristol.
„ 4	Cardiff	
„ 4	Croydon Microscopical	Public Hall, George-street, Croydon
„ 4	Holborn	
„ 4	Leamington	Trinity Church Room, Morton-st.
„ 4	Maidstone	"The Palace," Maidstone.
„ 4	Richmond	Greyhound Hotel, Richmond.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

FEBRUARY 23.—Technical Meeting.—Mr. T. Sebastian Davis, F.C.S. (Vice-President) in the chair.

The CHAIRMAN stated that the Council had appointed Mr. H. Chapman Jones, F.C.S., to be Hon. Secretary of the Society. He also announced the death of Mr. Edwin Cocking, formerly Assistant Secretary of the Society, and said that, having been associated with him for a number of years, he felt the sudden separation keenly. He referred to the extreme personal interest exhibited by Mr. Cocking in the prosperity of the Society during his fifteen years' office, more especially with reference to the annual exhibitions. The Council had voted an expression of sympathy with the family.

Mr. J. SPILLER joined in the Chairman's expression of sympathy, and said that Mr. Cocking had worked for a great number of years in the interests of photography and photographers. Those who, like the Chairman and himself, had worked so long with Mr. Cocking felt deeply for the family in their bereavement.

Mr. Chapman Jones having brought the old and new forms of Sawyer's actinometers for the inspection of members, and compared their respective merits,

Mr. W. SWAN said that the old form of Johnson's actinometer was probably more useful than the recent one, especially for carbon and platinum printing.

Mr. SPILLER asked whether the paper was first sensitive to the tints in the dry state when moisture was present.

Mr. H. A. LAWRANCE quoted from Eder's experiments, proving that bichromated gelatine in the dry state was insensitive compared with it when it was wet and moist.

Mr. T. SEBASTIAN DAVIS exhibited a modification of his printing frame, designed to obviate the shearing action caused by the movement of the springs. Catches placed at each side of the frame prevented movement of the paper by holding the back of the frame in its place, and allowing the springs to be moved without altering the position either of the back or the paper.

The subject for discussion was *The Relative Merits of Different Processes for the Production of Lantern Slides*.

The CHAIRMAN said he had been much struck by the beauty of the slides prepared by the ordinary wet-collodion process by Mr. P. H. Fitzham. Absolute clearness in the high lights was not to be expected with modern processes. With gelatine there was a certain tendency to slight haze in the more transparent parts of the picture; with wet collodion there was not the slightest tendency of that kind. Comparing one thing with another, the brilliancy of gelatine slides was not equal to wet collodion. He also spoke of the advantage of isochromatic plates in certain branches of photo-micrographic work.

Mr. A. COWAN said that with gelatino-chloride the high lights were as clear as gelatine and glass could make them. Bromide plates would give the same results if they were slow enough.

Mr. T. E. FRESHWATER always used wet plates where possible, as in his hands the process was much the simpler, and certain in its results. For contact work he used all sorts of commercial plates. He had tried the new developer, rodinal, and found it gave clearer shadows than the other developers. He agreed with the Chairman that isochromatic plates were a great advantage in photo-micrographic work. He always toned his wet-plate slides with gold.

Mr. CHAPMAN JONES asked whether the clearness said to be given by wet collodion was necessary? He thought it might conduce to a great amount of hardness.

Mr. J. D. ENGLAND showed a number of slides on gelatino-chloride plates having great clearness, and showing different colours, obtained by lengthening the exposure and restraining development. He also exhibited Scanlan's metal holder for film lantern slides. In reply to a question, he said he got just as good slides on films as on glass—in fact, he could detect no difference.

Mr. T. SAMUELS said, if he made his own slides, he should use the wet-collodion process in preference to any other, as by that process the best results could be got from inferior negatives. It had been said that wet-collodion lantern slides were sometimes hard. Probably it was so with under-exposed negatives. A great point with over-exposed negatives, useless for printing purposes, was that, by timing the exposure and regulating the development and intensification, excellent slides could be made by wet collodion, which was a great advantage. If one had good negatives, good slides could be made on commercial plates; but, unless the negative was good, they were unable to get the same result with gelatine as with collodion. Lantern slides by contact could also be made with wet collodion by using paper to keep the film from the negative. A nice, soft picture resulted, the "diffusion of focus" being very pleasing. He would give the preference to wet collodion, because there was no doubt about the permanence of collodion slides, and, besides, they could be toned.

In reply to a question, Mr. T. R. DALLMEYER said crisper definition by copying than by contact could be obtained, particularly in reducing; a rectilinear lens answered the purpose, it was only a question of exposure.

Mr. CHAPMAN JONES said that some people thought that in exposing by contact they got a certain quality of slide by using magnesium, not obtained by gaslight or daylight. Was that so?

Mr. T. C. HEPWORTH said a deal depended on the colour of the negatives. If they were yellow, there was a decided gain in using magnesium, especially with chloride plates.

The CHAIRMAN said that in illuminating microscopic objects they occasionally had a great amount of detail and little contrast, and in photographing them it was difficult to obtain contrast in the light and dark portions of the picture. If they reduced the light considerably, they got a much more even image, and the contrast became increased. The difference was obtained by simply altering the position of the lamp, and it was analogous to the different effects produced by printing in full sunshine and in shadow.

Mr. T. R. FRESHWATER said that the whole secret of photo-micrographic work was that the object should be properly lighted. The light wanted modifying to suit the objects.

Mr. W. ENGLAND said that for copying he would use both wet and dry plates from a business point of view; but, simply as an amateur, he would not touch wet plates. He thought that practically as good results could be got with the one as with the other, though perhaps with wet plates there was a greater range of power, because from inferior negatives, as had been pointed out, better results could be obtained.

After some further discussion the meeting terminated.

Camera Club.—February 18.—Mr. S. B. WEBBER read a paper upon *Orthochromatic Photography*. Captain Abney occupied the chair.—The lecturer gave an account of some experiments in photographing certain subjects, including stained-glass windows and old documents, and described his method of preparing and treating the plates in orthochromatic work. A number of slides of the different subjects was shown and described illustrative of the lecture. March 3, a complete demonstration of the carbon process will be given by the Autotype Company.

Holborn Camera Club.—February 19, Mr. T. O. Dear in the chair.—Samples of Eastman's extra-rapid bromide paper were distributed amongst the members present. A representative of the Incandescent Gaslight Company, Limited, demonstrated the use of this form of gaslighting as applied to the optical lantern. The light seemed very powerful, and was, without doubt, a long way ahead of the oil lamp for use in the lantern. Next Friday (February 26), American slides.

Lantern Society.—February 22.—Three sets of slides, which had been made from three different 12×10 negatives, each set consisting of seven slides by seven different processes, were submitted for comparison. Two lanterns, each having the same kind of lenses and condensers, and arranged to give equal-sized pictures with an equal amount of light, were used. Two slides from the first set were then shown on the screen, and, the best having been selected by the audience, the other one was removed and a third slide substituted, and so on, until the best of the seven was finally selected. The same process was then gone through to get the second best; and so on with all the seven. This was done with all three sets. No information whatever was given to the audience concerning the slides, either as regards the maker's name or the process, until the judging was finished, when it was found that the order of merit was as follows:—*First Set*: 1. Collodio-bromide (Ackland); 2. Gelatine; 3. Wet collodion (York); 4. Wilkinson; 5. Collodio-bromide (Brooks); 6. Albumen (Levy, Paris); 7. Collodio-albumen (Ackland). *Second Set*: 1. Collodio-bromide

Ackland); 2. Gelatine); 3. Wilkinson; 4. Collodio-albumen (Ackland); 5. Albumen (Levy, Paris); 6. Collodio-bromide (Brooks); 7. Wet collodion (York). *Third Set:* 1. Collodio-bromide (Ackland); 2. Gelatine; 3. Wet collodion (York); 4. Albumen (Levy, Paris); 5. Collodio-bromide (Brooks); 6. Wilkinson; 7. Collodio-albumen (Ackland). The agreement between the two best slides in each set is worth noting. A new spirit set by Mr. Turnbull, of Edinburgh, and a lantern-slide printing frame by Mr. Dove, of Sandown, Isle of Wight, were exhibited; also a new projection lens, by Wray, of nine inches equivalent focal length and two and a quarter clear aperture of back lens, which gave most admirable results. This lens is corrected for photographic work as well.

Polytechnic Photographic Society.—Some prize lantern slides were shown. It was suggested that these exhibitions would be very much more valuable if the size of the original negative, method of preparing the slide, &c., were given, instead of having only the titles of the pictures, as in the present instance. March 4, *Flashlight Photography*, by Mr. T. Paternoster.

North London Photographic Society.—February 16, 1892, Mr. J. Traill Taylor in the chair.—Mr. A. MACKIE reported that, under the rules governing the affiliation scheme of the Photographic Society of Great Britain, the Society was entitled to send two delegates to the Committee, and Mr. E. W. Parfitt was accordingly elected to act as second delegate. Mr. J. WEIR BROWN then read a paper *On Uranium Toning of Bromide Prints* [see page 133], dealing very fully with the discussions which had taken place since he introduced the process, and the various modifications which had been recommended. In the result, he was disposed at present to prefer the process as he originally recommended it, although some of the alterations suggested would possibly be of assistance when more fully tested by experiment. The paper was followed by a demonstration, in which a number of bromide prints were toned under varying conditions, and a cordial vote of thanks was tendered to Mr. Weir Brown at the close of the discussion which resulted from the paper. Bromide prints were shown by various members. Next meeting, Tuesday, March 1, *Platinotype Printing*, by Mr. J. Martin. Visitors are invited.

North Middlesex Photographic Society.—February 22, Mr. J. W. Marchant (President) in the chair. Mr. T. SMITHIES TAYLOR, of Leicester, delivered a lecture on the *Use and Design of Photographic Lenses*, fifty-four members and friends being present. Mr. Taylor dealt with the subject in a most lucid and concise manner. Beginning by illustrating the progression of the waves of light by comparing them to the motion communicated to a rope, when the long, slow waves represented red light, medium waves yellow, and short, rapid waves blue, he followed on by showing diagrams by means of the lantern, explaining that light proceeded from its source in a succession of hollow shells or spheres; the manner in which a minute ray of such a wave of light would be transmitted by a pinhole, or larger quantities of the wave would be condensed by a lens to form an image. In this connexion he used and amplified Professor Sylvanus Thompson's illustration of a line of soldiers marching forward, and encountering rough ground in their course, showing how the line of march would be altered by the obstacles met, and showed the similarity of effect when the waves of light meet a dense medium, in their passage through the air, in the shape of a lens. Having dealt with the principles involved, Mr. Taylor conducted his audience with equal esse through the bewildering varieties of lenses, explaining the suitability of each for its special purpose, and its disadvantages for others. Samples of lenses in various stages of preparation were shown, and the general methods of production explained. In answer to a number of questions, Mr. Taylor supplemented his lecture by dealing with standard tests for the desirable qualities in lenses which might be applied by photographers—*e.g.*, for flatness of field, definition, spherical aberration, mechanical perfection of surface of lenses, centering of lenses in the mounts, ratio value of stop in single and R. R. lenses as compared with their actual diameter, and the coincidence of visual and chemical foci. On March 14 Mr. Walker will have a chat with beginners on *Photographic Procedure*.

South London Photographic Society.—February 15, the President (Mr. F. W. Edwards) in the chair.—Specimens of work with the rodinal developer were shown, and the merits of it were discussed. The following proportions were found to give better results than those advised by the manufacturers:—One part in twenty-five parts of water for negatives, one in forty-five for lantern slides and transparencies, and one in sixty for bromide paper. The PRESIDENT brought to the meeting a large number of prints from isochromatic and ordinary plates, and explained the occasion on which the use of the former was advantageous. Mr. Miller exhibited some prints from negatives taken on Britannia plates which had been kept at the Cape for over twelve months before use. The platinotype paper used was over two years old, and the results were quite equal to any which can be obtained on fresh plates and paper. The competition for the best print on bromide paper had but few entries. Mr. Whitby was declared to have produced the best results. Messrs. Whittingham & Co. showed their new pattern cameras for the coming season.

Brixton and Clapham Camera Club.—February 18, Dr. J. Reynolds in the chair.—Mr. Crouch, who had been announced to deliver a lecture *On Lenses*, had telegraphed at the last moment to say that, by his doctor's orders, he was confined to his house. An *impromptu* question box was made of the Chairman's hat, and various remarks and difficulties, which had occurred to members, were discussed.

Lewisham High Road Camera Club.—February 19, Mr. H. Davis in the chair.—Professor CARLTON J. LAMBERT, M.A., gave a lecture *On Light Measurement*. He showed the difference between the visual, actinic, and heating effects in the spectrum, and explained the cause of colour blindness. The following tables, by Captain Abney, showed how rapidly the actinic value of sunlight falls off as the sun's altitude decreases:—

	Candles at 1 foot.	Actinic.
Sunlight—June, overhead—visual	5500	120,000
30° altitude	4700	72,000
20° ,,	3300	42,000
10° ,,	2000	9,000
Before sunset	140	1·7

Professor Lambert tested the tables on February 18, 1892, when the sun's altitude was 20°, and found the visual effect equalled 2700 candles at one foot. The following is another table, by Abney, of actinic values:—

1 visual candle of sunlight	= 20	ordinary candles.	
,, ,,	electric arc = 10·7	,,	,
,, ,,	magnesium = 2·5	,,	,,
,, ,,	limelight = 2	,,	,,

Professor Lambert found that 20-candle-power gaslight gave a print on albumen paper in 27 hours. Captain Abney found a trace of a print on platinum paper in 20 hours. When there is a very bright moonlight night, people are apt to say that it is almost as bright as day. To show how ridiculous that is, Professor Lambert found that full moonlight in February = 1 candle at 10 feet, and that full sunlight in June = 550,000 such moons, which would cover the whole vault of the sky five times over. By means of photometers he compared different kinds of lights with a standard 16-candle-power Argand. Vulcan petroleum lamp = 30 candles (badly trimmed); limelight (blow-through jet) = 107 candles (gas was running short, or it would have been 150 to 200); Welsbach incandescent, with special mouth = 60; small incandescent electric lamp, lighted by 9 E.S. dry batteries = 1¼. He explained the method of comparing sunlight with standard candle by means of a rotating disc, with section cut out measuring ¼ part of sunlight; this was compared with magnesium light directly, and the magnesium compared with a standard candle. It is worked out in the following manner, viz.:—¼ sunlight = magnesium at 2 feet = 200 candles at 2 feet = 50 candles at 1 foot. ∴ sunlight = 54 × 50 = 2700 candles. Thia is how the result, stated as obtained on February 18, 1892, was arrived at. Abney's corresponding figures for same at 20° elevation were 3300. The following tables have been worked out by Professor Lambert, the cost of electric light being obtained at the Crystal Palace Electric Exhibition, so are right up to date:—

EFFICIENCY OF GAS-BURNERS.

	Candle Power. Standard Candles.	Consumption. Cubic ft. of Gas.	Efficiency. Candle Power per Cubic foot.
Common Bray, No. 2	3	3	1
,, ,, No. 5	9	6	1·5
,, ,, No. 7	14	7	2
Bray's Special Batswing, No. 9	20	8	2·5
London Argand	16	5	3·2
Albo carbon	20	3	6·6
Wenham	90	10	9
Welsbach	36	3	12
Gas engine, driving dynamo and 100 incandescent lamps	3200	400	8

DOMESTIC LIGHTING.

Annual cost of maintaining a light of 48-candle power, say, 2000 hours' burning. Results of tests under practical conditions:—

Gas.

Argand.—Three 16-candle lamps, consuming each 5 feet of gas per hour = 30,000 cubic feet of gas, at 3*s.* per 1000, 90*s.*; renewals of chimneys, 3*s.*:—Total, 93*s.*

Wenham Regenerating.—One small Wenham lamp, consuming 6 feet per hour = 12,000 cubic feet of gas, 36*s.*; repair of lamps, &c., 5*s.*—Total, 41*s.*

Albo-carbon.—Two No. 2 Bray burners, consuming each 3½ feet per hour, carburetted with naphthaline = 14,000 cubic feet of gas, 42*s.*; 52 pounds of naphthaline, at 3*d.*, 13*s.*—Total, 55*s.*

Welsbach Incandescent.—One new large mantle 48-candle power, burning 3½ feet per hour = 7000 cubic feet of gas, 21*s.*; renewal of mantles, 3 at 2*s.* 6*d.*, 7*s.* 6*d.*; renewal of chimneys, 1*s.* 6*d.*—Total, 30*s.*

Petroleum.

Large Lamp.—One 48-candle Vulcun, burning 1 gallon in 28 hours = oil, at 7*d.* per gallon, 41*s.* 8*d.*; chimneys, wicks, &c., 2*s.* 4*d.*—Total, 44*s.*

Small Lamps.—Four 12-candle lamps, each burning 1 gallon in 84 hours = oil, 55*s.* 6*d.*; chimneys, &c., 2*s.* 6*d.*—Total, 58*s.*

Electric.

Incandescent.—Three 16-candle lamps, absorbing each 56 Watts = cost of current, at 8*d.* per Board of Trade unit (1000 Watt hours), 224*s.*; lamp renewals, 6 at 3*s.* 6*d.*, 21*s.*—Total, 245*s.*

Note.—The figures above apply to the use of the various illuminants under ordinary household conditions. Careful laboratory tests, of course, give better results.

COMPARATIVE ESTIMATE OF COST OF LIGHTING BY ELECTRICITY AND GAS.

ELECTRICITY.

Outlay on Plant.

	30 Lamps.	300 Lamps.
6-lbs. gas engine, 2 h. p. nominal, 4½ h. p. indicated	£85	£330
Dynamos—50 volts, 40 ampères	40	200
Lamps (16-candle), switches, &c.	20	100
Fitting	10	60
	£155	£600

Annual Expenditure.

Renewal of lamps, 30, at 3*s.* 6*d.*	£5	£50
Depreciation, 10 % on £130	13	55
Labour	20	30
Gas and oil for Engine, 3 h.p., 1500 hours, ¾ per h.p. per hour	14	120
Interest on plant, 4 % on £150	6	27
	£58	£282

(If using accumulators, add £100 to cost of plant.)

Gas.		
Gas consumption 288,000 cubic feet, at 2s. 6d. per 1000, using good ordinary burners, averaging 2½-candle power per cubic foot	£36	£360
Depreciation, repairs, interest on cost of fittings	4	40
	£40	£400

Note.—If electricity is supplied from public mains, at 8*d.* per Board of Trade unit, the annual cost, including renewal of lamps, will be £89 and £890.

Of course, what cannot be reckoned in above figures is the improved health when electric light is used; besides, the furniture, &c., does not get spoilt as when using gas.

Croydon Camera Club.—February 15, the President (Mr. H. Maclean, F.G.S.) in the chair.—Mr. A. Smith, junior, was elected a member. Mr. J. Wirth Brown gave a paper, which dealt with the newest modifications of his now well-known process for obtaining warm tones on bromide paper by means of the uranium toning bath. Prints and various solutions of precipitated uranium were shown, and a demonstration of the procedure necessary was given. Besides the usual brown and red tones, the lecturer explained how a green image could be obtained, suitable for sea pieces, also a blue one. The voting to decide the winner of the President's prize for the best print from a negative taken at a Club excursion in 1891 resulted in favour of Mr. Holland. The Annual Dinner of the members and friends will be held at the Greyhound Hotel, at eight o'clock on Thursday, March 17. An early application for tickets, price 4*s.*, should be made.

Putney Photographic Society.—February 17, Dr. W. J. Sheppard in the chair.—Undoubtedly the most elaborate, and one of the most practical, demonstrations before the Society was given by Messrs. Burton and Braham (representing the Autotype Company) *On Carbon Printing*. A short introduction and history of the process by Mr. Braham was followed by detailed explanations and the working of each stage in the process. Numerous prints, enlargements, opals, and transparencies, in all colours, were arranged about the room, and samples of the tissue supports, with the various actinometers, were handed round for inspection. That the process possesses the merits of cheapness, beauty and great simplicity, there can be no doubt. Its wider adoption by members of this Society is assured.

Brechin Photographic Association.—February 17, Mr. A. R. McLean Murray in the chair.—Mr. J. D. Ross (the Secretary) read a paper on *Shutters*. A large number of shutters were described, and about a dozen specimens shown, including snap-shot shutters with safety blind and time and instantaneous shutter with speed indicator, kindly sent down for exhibition by the Thornton-Pickard Manufacturing Company. These shutters were favourably commented on by the members, the safety blind being a particularly useful adjunct, especially in "magazine" cameras. Samples of the new Eastman rapid bromide paper were distributed.

Leeds Photographic Society.—February 15, Mr. S. A. Warburton (Vice-President) in the chair.—The subject for the evening was *Toning Bromide Prints*, upon which Mr. A. A. Pearson spoke as follows:—It is averred that after development, and before fixing, a bromide print will tone to almost the same range of colours as an albumenised one in the following bath:—Ammonium sulphocyanide, twelve grains; hypo, one grain; gold chloride, one grain; water, four ounces. I have failed to get anything but a little strengthening of the natural black, though gold is evidently deposited on the image, because it refuses to bleach in a solution of mercuric chloride. A second method is to bleach a finished print in a saturated solution of mercuric chloride, made by dissolving about ten grains to the ounce of warm water, and allowing it to cool, until the image nearly disappears; wash thoroughly for at least one hour, and immerse in a very weak solution of ammonia—not more than one drachm of "880" to a pint of water. The result is a rich, dark brown, which is unaltered by drying. If the ammonia is stronger, the colour disappears on drying. As this process intensifies the image, it is necessary to allow for it by a little over-exposure and under-development. A similar, but rather warmer, brown is obtained by substituting for the ammonia a ten per cent. solution of hypo. In this case the intermediate washing may be reduced to a mere rinsing under the tap, by immersing it after the rinsing in a five per cent. solution of potassium bromide for a few minutes, which is again washed out under the tap before immersing in the hypo. The tone is also improved by its use. We now come to the uranium method, by which any colour from dark brown, through sepia to Bartolozzi red, is easily obtained. The formula issued by the Eastman Company answers well, and will keep for a day or two in the dark:—Ferricyanide of potassium, nine grains; nitrate of uranium, eight grains; glacial acetic acid, five drachms; water, sixteen ounces. Drop the ferricyanide into a measure, pour a little water on, and run it off to dissolve away the coating of ferrocyanide which may have formed by the action of the light and air, add the nitrate, a few ounces of water, crush the crystals with a glass stirring rod, and, when thoroughly dissolved, add the acetic acid, and finally, the uranium nitrate. Immerse the finished print, which has been properly fixed and washed, and preferably dried. If dried, it is advisable to wet it again, by immersing in water. The brown tones appear in a few minutes, and finally the reds. Then wash well in running water for about twenty minutes, until the stain is cleared from the high lights. Too long washing will dissolve away the tone as well. The secret of success lies in thoroughly eliminating the hypo after fixing, the slightest trace causing a stain in the high lights which cannot be removed. If running water is not available, the prints may be floated, face downwards, for half an hour or more in a dish of water, which is changed several times. The above quantity will tone equally well a single quarter-plate, or a dozen 10 × 8 prints, the toning of the greater surface being only a question of time. It is recommended to tone by daylight. The acetic acid may be dispensed with if the solutions is to be used immediately, but if the water is hard, a little must be used to prevent the decomposing action of the lime, and any precipitate must be filtered out. Don't use rain water unless boiled and filtered. In this case, use three or four grains of each salt to the ounce, and after toning, clear, by immersing in a weak alum bath, or an ordinary hypo fixing bath, followed by a final washing. For brown tones, the print must be developed to about full density, but for reds the intensifying action is so great that it must be allowed for by using a rather weak and somewhat flat print. I find it best to use the ferrous oxalate developer—one drachm of iron to eight drachms of oxalate, and a single drop of bromide solution (Eastman's formula), and give a full exposure, so as to develop rapidly. Hydroquinone may be used; preferably the Ilford formula:—No. 1. Hydroquinone, one hundred and sixty grains; potassium bromide, thirty grains; sodium sulphite, two ounces; water, to twenty ounces. No. 2. Sodium hydrate, one hundred grains; water, twenty ounces. Use one part No. 1, one part No. 2, one part water. The exposure required will be about twice that for ferrous oxalate. Hydroquinone has a tendency to blister and soften the film, whereas ferrous oxalate hardens it. For blue and green tones put five or six drops of a saturated solution of ferric chloride (perchloride of iron) into a measure and add two ounces of water; pour this on to one of the washed red or red-brown prints in a dish; the half-tones will rapidly become bluish-green, and, if stopped by immersion in water before the shadows are fully changed, the resulting print will present a moonlight effect, with dark olive-brown shadows and blue-green half-tones, and just sufficient tinting of the whites to be natural. This tone is most effective in a transparency or an enamelled print, which should not be weak or flat to begin with. For pure Prussian blue, put three or four drops of hydrochloric acid into a measure, add two ounces of water, and pour over the print. In the meantime put three or four drops of the ferric chloride solution into the measure, and return the acidulated water to it; flood the print with the mixture, which will rapidly change it to the colour of a ferro-prussiate print. If this be well washed, and a very weak solution of ammonia (not more than two drops to the ounce) poured over, it will change to a purple blue, very like the bloom of the agapanthus, or African lily. A stronger solution will completely bleach it. In all cases, wash the print finally as directed. With regard to any slight stain in the high lights, it does not appear to be detrimental to the artistic effect of a picture, if the stain is not so deep as to materially shorten the scale of gradation.

Manchester Photographic Society.—February 11, Mr. Abel Heywood, jun. (President), in the chair.—A number of every-day matters photographic were introduced. The question of plate backing received attention from several of the members, who gave their methods and experiences. Mr. Chilton used burnt sienna, as sold at the colour shops, mixed with a weak solution of gum, laid on the back of the plate with a flat brush. Mr. Coote used a brown pigment in a similar way. Mr. Wood was in favour of black tissue paper stuck on with glycerine. This is easily removed, and he did not consider the glycerine left on the plate any detriment to the developer. Mr. Hughes employed a piece of black velvet pressed against the plate in his single backs. The opinions as to the benefits from backing plates were varied, as far as the speakers' experiences went. Under some conditions backing was of very little use, and a reliance on correct exposure, in the opinion of a few, was more important in obtaining good results. To dry plates treated with a moist pigment, a light-tight box or packing case, which had been previously well warmed before a fire, was recommended as the simplest and safest, the well-dried wood being sufficient to absorb the moisture given off. Mr. Edwards gave a demonstration of his method of working. He first explained his hand camera, which was the result of several seasons' experiences. It is for plates 3¼ × 3¼, a special feature being that the lens is fixed on the outside of the roller blind shutter and a little above the centre line of the plate. This gives the benefit of a raised front, which he had found to be most required. By placing the camera on its side, the horizon would be central on the plate, and by holding the camera upside down the advantage of a falling front was obtained. Mr. Edwards did not print direct from his small negatives, but by means of a very simple home-made apparatus printed enlargements on bromide paper. He very successfully demonstrated the ease with which these were obtained, though good results could only be obtained by proper timing of each negative and careful development. He used the albo-carbon gaslight in his lantern. This gives a fairly regular light, so that, once the correct exposure is obtained for each negative, any number of prints of a uniform quality can be made. In developing, ferrous oxalate was used; and, by the control given by the use of the acid bath and local application of developer with a brush, he considered it the best for general work. Mr. Edwards promised to show his method of putting in clouds to the developed prints, and other dodges in finishing up pictures, at the next meeting. Swinden and Harp's latest hand camera was shown and explained by Mr. Bennington. Several improvements have been made since the last appearance of this firm's apparatus was before the Society. A developing contest was arranged for. A number of variously exposed plates were to be distributed to the members, who were to develop them to the best of their ability, and bring the results to the next meeting.

Midland Camera Club.—February 19, Dr. Hall Edwards in the chair.—Mr. Belcher showed the "Cytos" electric dark-room lamp, a new introduction of Philip Harris & Co., worked by five cells; Frederick Iles, a method of his own of etching lantern slides; Professor Allen, two platinum prints, to illustrate charp versus fuzzy prints. The meeting then adjourned to the Examination Halls, where a good muster of ladies and gentlemen, friends of the members, were waiting for the lecture by the President on *Photography as an Art*. In the course of his lecture, the President showed slides by the following members:—Mrs. Welford, Roland White, S. G. Mason, and W. D. Welford; also by Mr. and Mrs. Francis Clarke, J. P. Gibson, Edgar G. Lee, Harold Baker, and G. W. Wilson & Co. The slides receiving most appreciation at the hands of the audience were decidedly those of Mrs. Clarke and Edgar G. Lee. A number of freaks and distortions were shown as, "what not to do."

Newcastle Photographic Association.—February 16, Mr. J. P. Gibson (Vice-President) in the chair.—The Secretary (Mr. Edgar G. Lee) read the report of the Council for 1891, which congratulated the members upon the continued prosperity of the Association, the membership having increased from 115 to 140 during the year. Outdoor meetings had been held at Bellingham, Fountains Abbey, Rothbury, and Barnard Castle, and had been unusually well attended. In the competition promoted by the Association, the

class devoted to lantern slides was of very high quality; but the class for prints, confined to amateur members of the Association, both in number and in quality, was much below what ought to be expected from an Association like theirs. The report was adopted. Mr. T. O. MAWSON read a paper *On Platinum Toning on Matt-surface Paper* [this will appear in a future number].

North Wales Photographic Society.—The want of an amateur photographic society has long been felt in North Wales, as, notwithstanding the fact that there are some 250 such Societies in Great Britain, only three of these are in Wales, and they are in the southern portion of the Principality. To meet this want a few of the leading local photographic lights met at the Llandudno News-rooms on the 18th inst., and, as a result, a Society has been formed under the title at heading. Two well-appointed, commodious dark rooms are already being fitted up with the latest, most approved appliances and fixtures. All the daily and weekly papers—of course, including the photographic—will be available to members; a billiard room, with two tables, adjoins the reading-room, and there is a well-stocked library. It was decided to admit visitors to membership during the time they are staying in the neighbourhood for a subscription of 1*s.* per week, the use of dark rooms for developing being charged for at the rate of 1*s.* per hour, which charge includes gas lamp, fixing bath, water, trays and measures, &c. For changing plates a charge of 3*d.* for ten minutes will be charged. This is expected to prove a great boon to visiting amateurs, who flock to the town in large numbers during the summer months. The Secretary will be glad to receive further names of members wishing to join, addressed to him at the Llandudno News-rooms, Mostyn-street, Llandudno. Meetings, first and third Thursday in each month; also, monthly lantern exhibitions, demonstrations, lectures, or *soirées*. A paper was read on the 19th inst., in the rooms of the Llandudno Debating Society, by Mr. W. A. Whiston, on *Amateur Photography*. The lecturer gave a very complete history of the birth and development of the "black art." This he followed by a practical demonstration, comprising, *inter alia*, the production of a negative by flashlight of the Chairman (Rev. J. Raymond). This was developed in view of the audience, fixed, dried with spirit, and a lantern slide printed, developed, fixed, dried in a very few minutes, and shown by the oxy-hydrogen lantern, ably manipulated by Mr. Hughes, of Rochester House. Several defective slides were then thrown on the screen, the lecturer pointing out the faults in each. One slide, made by the lecturer, was a most amusing instance of double printing. It was a large steam yacht, steaming up Lake Ogwen. Puzzle—How did the yacht get to this inland Welsh lake?

Tyneside Camera Club.—February 11, the President (Mr. J. F. McKie) in the chair.—A paper was given by Mr. W. BELL *On Chloride of Silver Emulsion Papers*. In the discussion Mr. ROTHWELL said he printed a piece of chloride of silver paper, and made a toning bath ten months ago, and toned the print last week; the whites of the print were slightly grey, but it toned splendidly; the print was not kept from the air, but in a dark place.

Correspondence.

DALLMEYER'S REFLECTING MIRROR.

To the EDITOR.

SIR,—I have just finished reading, in your last number, Mr. T. R. Dallmeyer's paper on *Reflections Combined with Refractions*. It concludes thus: "Another application that has struck me as useful for such class of reflecting mirrors, on account of the large angular aperture attainable, is in regard to use in naval work for scanning the horizon in dull weather. If such a mirror, a foot or more in diameter, were mounted in some manner, such as a ball and socket mounting from its centre, carrying an eyepiece on an arm, a rapid and powerful search might thus be made of the horizon." If by this Mr. Dallmeyer means the employment of the mirror he describes to throw a strong beam of light over the sea as a search-light, he has been anticipated in his suggested application several years ago, the mirror being a lenticular one, similar to that which he describes in his paper. Reflectors of this nature, that is, concavo-convex lenses, silvered on the convex surface, have long been before the public, and have been applied to the very purpose now suggested.

The credit of this application of the reflector belongs to Messrs. Mangin, Lemonnier, & Co., of Paris, who protected their invention by patent some years since. There are eight special claims in their patent, the two first being as follows:—"1. The construction of a reflector of silvered glass, with spherical surfaces having different curvatures, and in which the spherical aberration, due to reflection, is compensated by the spherical aberration due to the refraction. 2. The employment, substantially as described, of the said reflector in the construction of apparatus for projecting light." If, therefore, Mr. Dallmeyer has presented the reflector as a novelty, I hope he will not take it unkindly of me in pointing out its antiquity relative to every-day inventions.

Perhaps I may also be permitted to express my surprise at such veterans as Captain Abney and Mr. Traill Taylor, who, according to your report, were present when the paper was read, and both of whom must have known better, listening to the paper without saying a word indicating knowledge of the previous existence and application of the mirror, facts of which they must have been well aware.—I am, yours, &c.,

Devonport, February 16, 1892. COMMANDER.

[Our correspondent is too clever. Mr. Dallmeyer's paper consisted merely of a mathematical demonstration of means by which the spherical aberration of parallel rays from a large reflecting concave surface could be eliminated, and the exhibition of a reflector in which this was accomplished. His suggestion for the employment of such a mirror for naval purposes had not necessarily any connexion with its use as a search-light, and if "Commander" had grasped the subject more comprehensively he would have noted, what he quotes above, that an *eyepiece* forms an element in the suggestion, implying the formation of an image, a thing totally different from the scope of a search-light. We freely grant to the French firm named the credit of the application of this special form of mirror to the purpose claimed, but take exception to the validity of the first of their claims, viz., the construction of such a reflector; for in a work on the ophthalmoscope, by Dr. Adolf Zander, kindly brought under our notice by a friend, a translation (from the German) of which, by Dr. Brudenell Carter, was published by Hardwicke in 1864, we find a drawing of just such a reflector as that claimed by the French firm, whose patent only dates from 1880, thus being anticipated by sixteen years. There was nothing in the paper to call for other remarks from Captain Abney and Mr. Taylor than those made by them—viz., the former speaking of the advantages of a reflector for a certain class of investigations made by him, and the latter stating that the reflector made and exhibited by Mr. Dallmeyer exceeded in angular aperture anything he had ever previously seen.—ED.]

MR. COLES AND MR. HOWSON.

To the EDITOR.

SIR,—The remarks made by me at the meeting of the London and Provincial Photographic Association to which Mr. Howson takes exception were to this effect, that Mr. Howson claimed *absolute* permanency for gelatino-chloride prints, and quoted Professor Burton as an authority for such claims, but that I thought the Professor was too careful a writer to have committed himself to the statement that either gelatino-bromide or gelatino-chloride prints were *absolutely* permanent. (The reports vary slightly, but the above is what is evidently alluded to.) As Mr. Howson says last week, "This is a matter which can be easily verified;" but it is, I submit, for him to do it by quoting the Professor's words from his published writings.

I am, of course, responsible for mixing up the questions of the permanency of bromide and chloride prints, but it never occurred to me that any one would claim greater permanency for the latter than for the former. Although in the latter, when toned with gold, the image may consist partly of that metal, yet, as the toning process is usually carried out, the substitution of gold for silver is by no means complete, and, unless special precautions are taken to the contrary, the image must consist to a certain extent of silver.

It did therefore, and does still, appear to me that if bromide prints are found to be unstable under the unfavourable conditions to which photographs must frequently be subjected, it is somewhat premature to claim "absolute permanency" for gelatino-chloride prints.

I have no wish to injure any reputation which Mr. Howson may have gained for moderation, but it was precisely because his claims seemed the reverse of moderate that I ventured to call it in question.

I readily agree, after the admission that has been made, as to the way in which the Alpha prints used as illustrations to THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC were produced, that we cannot regard any faded copies as necessarily implying instability of the process. No one would rejoice more than myself to find eventually that we could look upon the new gelatino-chloride paper as thoroughly reliable under all conditions to which photographs have to be subjected. As, however, there are probably no prints by that process existing which Mr. Howson would admit as evidence if found in a faded condition, may I be allowed to make the following suggestion, which I think many of your readers would like to see carried out?

Let Mr. Howson arrange with the publishers of one of the photographic papers to issue a print on the new printing-out paper, bearing a statement to the following effect:—

"This print is on . . . . paper, the correct manipulation of which is guaranteed by . . . . Prints, by this process being *absolutely* permanent, may therefore be subjected to the same treatment as engravings or platinum prints, *i.e.*, may be hung on a damp wall, sent abroad to damp climates, exposed to the impure atmosphere of badly ventilated rooms in which gas is burnt, used as book illustrations in contact with ordinary printing paper, or mounted with ordinary paste on common cardboard without risk of fading."

Notwithstanding occasional differences of opinion, Mr. Howson's genial presence is always welcomed at the various photographic meetings, and it would enhance the value of the print if he would let it be a portrait of himself. He is a good subject for the camera, and no doubt many would like to have a portrait of him, which we must hope would prove to be permanent.—I am, yours, &c.,

WILLIAM COLES.

Watford, February 22, 1892.

P.S.—I have no wish to prolong the controversy; but, if continued, may I ask the favour of its being restricted to one paper, as I cannot undertake to write letters on the same subject to two or three different periodicals.

ROYAL COMMISSION FOR THE CHICAGO EXHIBITION, 1893.

PHOTOGRAPHIC DEPARTMENT.

To the EDITOR.

SIR,—I should be much obliged if you would kindly give publicity to the following facts relating to photographs, &c., at the Chicago Exhibition.

Photographic apparatus and photographs are classified under Group 151 (instruments of precision, experiment, research, and photography, photographs), which is included in the department of Liberal Arts.

Photo-mechanical prints and processes, photogravures, &c., are classed under Group 76 (photo-mechanical and other processes of illustrating), which is, like lithography and printing generally, included in the department of Machinery.

All the photographic exhibits, however, will be placed together in the portion of the Liberal Arts and Manufactures building allotted to the British Section.

Screens will be fitted up for the exhibition of photographs, photogravures, and other pictures produced by photographic methods.

For the space on these screens the charge will be 2*s.* 6*d.* per square foot, with a minimum charge of 2*l.*

Exhibitors desiring to erect their own screens or stands can do so. In that case they will be charged for the ground they occupy according to the same scale as other exhibitors, viz.:—

									s.	*d.*	
For spaces not exceeding 100 sq. ft.					...	...	...		5	0	per sq. ft.
,,	exceeding 100 sq. ft.		and not exceeding		200	sq. ft.			4	6	,,
,,	,,	200	,,	,,	,,	300	,,		4	0	,,
,,	,,	300	,,	,,	,,	500	,,		3	6	,,
,,	,,	500	,,	,,	,,	750	,,		3	0	,,
,,	,,	750	,,	and upwards		...	...		2	6	,,

The minimum charge will be 5*l.*

All goods intended for the Exhibition will be admitted duty free, but on anything sold the usual Customs duty will have to be paid.

The English railways have undertaken to carry goods for the exhibition at half rates, and several of the more important steamship companies have consented to convey them at the reduced rate of 11*s.* per ton. The American railways will charge their ordinary rates on goods to the Exhibition, but undertake to bring them back free.

The Exhibition will be opened on May 1, 1893, and closed on October 30, 1893.

Applications for space in the British Section must be made upon forms to be obtained from myself, at the Society of Arts, John-street, Adelphi, London, W.C., and I shall also be very pleased to supply any further information. The forms should be sent in, properly filled up, not later than February 29, 1892, and addressed to me as above. After the end of this month, applications can only be received subject to space being available.—I am, yours, &c., HENRY TRUEMAN WOOD, *Secretary*.

Society of Arts, John-street, Adelphi, London, W.C.,
February, 1892.

PHOTOGRAPHERS AND THE TRADE.

To the EDITOR.

SIR,—Allow me to thank you for your article on this subject, and, as a member of the N.A.P.P., to congratulate the executive on what it has achieved in inducing some of the trade houses to treat photographers a little better than they have hitherto done. I have no doubt that if, during the last eight or nine years, the manufacturers and trade houses had invariably accorded such terms to the profession as they had a right to, the severity of the depression which has afflicted professional photography would not have been felt so keenly as it has. It is notorious that amateurs and the general public have very frequently been allowed to buy as cheaply as, if not more cheaply than, the poor professional, and the consequence of this is that a great deal of work that should have passed through his hands has been diverted from them. In fact, the amateur and the public have been allowed to buy too cheaply.

In other fields of commerce the wholesale houses make a study of protecting the trade by not supplying their goods retail, and by this means they encourage the retailer, and are sure of his support, and consequently of the ultimate patronage of the public. To the system lately obtaining in the photographic trade I can only see one finish—namely, depression among the manufacturers and trade houses, arising out of the fact that the middlemen (*i.e.*, the dealer and the photographer) have been passed over in favour of the general public, whose support wants cultivation of a particular kind which the wholesale man is less able to exert than the photographer.—I am, yours, &c., A COUNTRY PHOTOGRAPHER.

Leeds, February 22, 1892.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—March 7, *History of Gelatino-bromide Photography*, by Mr. J. Burgess. Visitors invited.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—March 3, *A new Enlarging Lantern without Condensers*, by S. H. Fry. 10, *The Wet Collodion Process*, by W. E. Debenham. 17, Monthly Lantern Evening.

ON Saturday afternoon last the *employés* and friends of Messrs. Percy Lund & Co., to the number of over one hundred, held their annual social evening in the Temperance Hall, Bower-street. Tea was served at 4.30 p.m., and at six o'clock the entertainment was commenced with a few opening remarks from Mr. Percy Lund. The principal items of the programme were an action-song, "Merry Gleaners," in which twenty-four of the junior *employés* took part, and a performance by the Practical Professional Amateur White Minstrels. A number of songs, duets, recitations, and instrumental items were given, with games interspersed.

CHICAGO EXHIBITION.—We understand that the British railways have undertaken to carry goods for British exhibitors at the Chicago Exhibition, to and from the port of shipment, at half rates. The American railways will charge their usual rates to Chicago, but will bring back the goods free at the close of the Exhibition. Many of the principal steamship companies have reduced their rates considerably, and will take freight for the Exhibition at 11*s.* per ton. Many of them have also consented to adopt a reduced passenger tariff for exhibitors and their *employés*, certified as such under the authority of the Royal Commission.

THE Birmingham Photographic Society's exhibition of photographs by the members will be held in the Young Men's Christian Association Rooms, Needless-alley (electrically lighted), on April 5, 6, and 7, 1892, from ten a.m. until ten p.m. each day. Twenty-six silver medals, a silver cup, two hand cameras, and other valuable prizes (besides certificates), are offered for competition among members only. In connexion with the exhibition there will be an exhibition of apparatus, and lantern shows will be given each evening. The Hon. Secretaries are Messrs. J. T. Mousley, 26, Portland-road, Edgbaston, and A. E. Tucker, 26, Paradise-street, Birmingham.

A CAMERA CLUB FOR CHISWICK.—A meeting of a few of the amateur photographers of Chiswick was held at the residence of Mr. R. W. Watson, to consider the advisability of forming a Club for this district. The matter was fully debated, and a resolution to form such a Club was carried unanimously. A Committee was appointed, and a number of members enrolled. A room has been taken at No. 344, High-road, Chiswick, which will be open for the use of members every Monday evening from seven to ten. Mr. H. Harding Miller has been appointed Hon. Secretary, and will be pleased to see any inquirers at the rooms on Monday evenings. A meeting was held on the 22nd inst., Mr. R. W. Watson in the chair.—The subject of platinum and bromide printing was discussed. February 29, *Lenses*, by A. E. Steadman.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN AFFILIATION SCHEME.—At a meeting of delegates, February 15, 1892, Mr. W. Bedford (P. S. G. B.) in the chair, the rules of the affiliation, as approved by the Council, were adopted. It was agreed that the Lantern Slide Sub-committee should put the Indian and Colonial set in circulation, obtain other sets as gifts or loans, and formulate regulations. It was decided to await the report of the Committee appointed by the Photographic Society of Great Britain on the methylated spirit question before taking any steps in the matter. It was decided to ask the Council what funds were at the disposal of the Committee, and that a list of dark rooms, available for the use of the members of the affiliated societies, should be prepared. It was decided that summonses to meetings should be sent to delegates only; all other communications were to be addressed to the secretaries of the affiliated societies. It was also decided to form a collection of good and instructive work for circulation, and that steps should be taken to promote the interchange of papers between the societies forming the affiliation.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—In the St. George's Hall of the Champion Hotel, Aldersgate-street, on Thursday evening, February 18, the Annual Musical and Lantern Entertainment was given to a large assemblage, including many ladies. Mr. J. Traill Taylor presided, and, in welcoming the guests, remarked that the London and Provincial Association was recognised as the leading English technical photographic Society, the reports of its proceedings always being read with great interest. A deal of useful work was done by the Association, and the entertainment of that evening was a relaxation from those labours. A capital programme was then gone through, to the extreme pleasure of the visitors. Misses Edith Teape and Helen Anderson, and Messrs. F. Bull and W. A. Ellesten contributing songs, Misses Jessie Drage and Edith Teape pianoforte soli, Messrs. Ashley Cowan and A. S. Newman recitations, Mr. H. Ellesten mandoline and Mr. F. W. Parfitt violin soli. Displays of lantern slides, the lantern microscope, by Mr. T. R. Freshwater, and the lantern polariscope, by Mr. J. J. Briginshaw, lent an agreeable diversity to an entertainment which was most successful throughout.

RICHMOND CAMERA CLUB.—An Entertainment was given in the College Hall, Richmond, on Friday, the 19th inst., consisting of music and a display of lantern slides by members of this club. About 300 friends of members were present. Mr. F. P. Cembrano, the President, in a few introductory remarks, asked for a little indulgence as regards the lantern part of the performance, the club being a young one. He said, however, that, although the club was young, it was rapidly growing. The programme was so arranged that music and slides alternated, an arrangement which gave considerable satisfaction. The musical part of the programme consisted of glees, songs, recitations, party and piano solos, all being well rendered by friends of members. The lantern display was of a miscellaneous character, slides being shown by Messrs. Cembrano, Behan, Such, Hunter, Ardasser, Faulkner, Davis, Perry, Bickerton, Ramsey, Keysey, and Ennis. The slides by Mr. Cembrano of Salisbury Cathedral and Glastonbury Abbey, taken during the meeting of the Photographic Convention last year, attracted a good deal of attention; and Mr. C. H. Davis's slides of Venetian and Tyrolese scenery were much applauded. The lantern was kindly furnished and manipulated by Mr. Beard. The entertainment passed off without a hitch, and the members of the Richmond Camera Club have every reason to congratulate themselves on this—their first—performance.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

R. T. MARSLAND.—Received.

J. F.—Either form of jet will answer.

IRIS.—Thanks. By all means let us hear from you.

BART ROUS; D. D.; and others.—Thanks; in our next.

E. W. MANDEN.—No such report has appeared in our pages.

C. J. KIRK.—See answer to "E. P. C.," in the JOURNAL of February 12.

ARGUS.—From what we know at present we would give preference to No. 2.

H. J. BRISTOWE-DAVIS.—The picture is an admirable example of this class of work.

W. A. T.—1. There is a chapter on "Enamelling Prints" in the current ALMANAC. 2. Yes.

W. BARNETT.—The use of cyanine is not patented, neither is that of chlorophyll. The results are interesting.

CHARLES SWAIN.—Thanks. Such an arrangement as you sketch has been in use for a number of years.

ECONOMY.—Modern developers do not hold silver in solution, hence the "reduction" you speak of would be futile.

HERMANN ERNST.—Dr. Kopp exposed the paper in the camera, by which means he is said to have obtained positives in colours.

W. A. LEGG.—For the proceedings of the Physical Society, apply to the Secretaries of that body at the Royal College of Science, South Kensington.

AMATEUR.—With stops of equal size, both lenses named will work with equal rapidity. Your orthographic lens will not be suited for architecture, as it will give pincushion distortion.

YORKS.—Most large dealers in photographic materials supply glasses with bevelled edges for the so-called "opalines," also ground opal glass for "porcelains." Write to some of those whose address you will find in our advertisement columns.

R. A.—Quite right; you can patent anything you like, and the patent will be sealed in due course if no one opposes. The patent being sealed is, however, no protection to the owner of it from being proceeded against for infringement of another patent for the same thing.

T. PAGE.—If you get "an excellent emulsion that yields perfectly clear shadows, but is rather too slow," its rapidity may be increased by extending the time of "cooking." As you are giving an hour and a half, try two hours or more, until you obtain the necessary sensibility.

M. STARKE.—The fault in the two negatives forwarded is that of over-exposure. As a beginner, you have overlooked the fact that the quality of the light has improved greatly during the past few weeks. It will continue to do so rapidly during the next month or two, so be on the alert.

A. F. M. POWELL.—The idea is good. The movement will work quite well. It was employed more or less extensively in or about 1854. It has not been patented. If you turn to our ALMANAC for 1874, you will see the subject dealt with on page 29. It is rather more fully dealt with on page 56 of our 1887 ALMANAC.

E. S. J. says he has some bromide paper that he has had by him several years, and it works all right. He asks if enlargements made on it now will be likely to prove as permanent as those on freshly made paper?—If the results are good, we see no reason to doubt their stability as against those on newly prepared paper.

C. DE PASS.—A cast from a Woodbury gelatine relief can be made in the ordinary "fusible metal," but not from a swelled gelatine relief, as the heat of the metal would cause the raised and more soluble portions of the gelatine to melt. A mould can, however, be made in plaster of Paris. A plaster cast from a soft gelatine relief will not be so sharp and crisp as one in fusible metal from a dry Woodbury one.

D. W.—1. One ounce of hyposulphite of soda to the pint of water is quite insufficient to fix prints, even if the time be prolonged to twenty minutes. Better risk blistering than have fugitive prints. 2. One grain of chloride of gold ought to tone a full-size sheet of paper, or its equivalent in prints, to a rich tone. Of course, the deeper the prints are toned, the more gold will necessarily be consumed in the operation. If only red-browns are wanted, less gold will be required.

SCOTSMAN writes that he has heard it stated that celluloid prints do not keep so well as plates, that is, after a time only foggy negatives can be obtained. He asks if this is correct?—Different opinions have been expressed on the subject. Theoretically, glass is inert on the gelatino-bromide. That can scarcely be said of a substance containing camphor and other volatile compounds. The emulsion may also be a factor in each case. On glass even some emulsions prove more stable than others.

WANDSWORTH asks, Can the rector of a village church prevent any one who has not obtained his permission from taking a photograph of it from the roadway? He adds that a friend of his was, some time back, "ordered off" by the sexton, on the ground that the rector had given a local photographer the exclusive right of photographing the building.—The rector has no power to prevent any one from taking photographs of the church, and we should not have surmised that any minister would be so foolish as to usurp it.

C. F. R.—1. Both Messrs. B. J. Edwards & Co. and Mr. J. Cadett would, we believe, supply you with a coating machine. 2. *Photography with Emulsions*, by Captain Abney (Piper & Carter).

SIWASH writes: "1. Can I copyright a portrait of a gentleman taken by me gratis without a letter of assignment? 2. Or a portrait, the negative of which was taken in my studio on the sitter's plate and then presented to me?"—In reply: 1. The copyright in a photograph is vested in the author of it. 2. The mere fact that a photograph was taken in a certain studio does not confer a copyright in it to the owner of the building, nor does the presentation to him of the picture itself, for the reason given in reply to the first query.

S. W. sends us a cabinet photograph, half of which has been stuck on to a mount, while the other portion is left free. That part which is attached to the mount shows unmistakable signs of fading, whilst the other does not. Our correspondent asks if this is not conclusive evidence that the cards are the cause of the fading, and if the dealer who supplied them is not liable for damages?—The evidence is by no means conclusive, inasmuch as the material used for mounting may be the cause of deterioration. Before taking proceedings to recover damages, our correspondent must make sure that he can prove that the fading is caused by the cards, and the test applied certainly does not do that.

H. HOLMES write as follows: "Most modern songs now bear the following on the titlepage, This song 'may be sung in public without fee or licence.' With this intimation, should I be doing wrong in making lantern slides of the music and showing them on the screen for the audience to sing from?"—All the modern music we have seen bearing the above intimation also bears something to the following effect: The sole and exclusive right of making manuscript or other copies of this work is vested in the owner of the copyright, and any other persons making such copies, without permission, render themselves liable to heavy penalties or damages. "Other copies" would certainly include photographic ones, whether for the lantern or on paper.

F. S. writes: "1. Can you kindly inform me if it is a usual thing for makers to put up seven drachms in the so-called one-ounce bottles of pyrogallic acid? Of late I have noticed that negatives having had plenty of exposure fail to give the required density without a further addition of pyro. On searching the formula of another maker, they say, 'Pyro, one ounce; but if the ordinary one-ounce bottles are used, add an additional drachm.' On following this advice, I found it answer my purpose. 2. In another formula, where carbonate of soda is used, the mention of (not bicarbonate) is made. Will you be kind enough to inform me of the difference, if any, between them? for on purchasing some at a chemist's, I informed him I wanted carbonate (not bicarbonate), which caused him not a little amusement. On mixing my developer, I failed to get the least appearance of my subject. Having tried two or three times, I purchased some at another chemist's, and, lastly, at a grocer's, all to the same effect. On writing to the makers of the plates, explaining my failure, they kindly offered to develop a plate for me, and, on the return of same, I found they had produced a negative with good printing qualities, informing me the only thing they could suggest was the impurities of the carbonate of soda. If you can kindly give me any information through your 'Answers to Correspondents,' you will oblige."—1. An ounce bottle of pyrogallic acid should contain 437½ grains of the acid, which is, roughly, three-quarters of a drachm short of the old apothecary's ounce of eight drachms, of sixty each, to the ounce. If eight drachms, or 480 grains, of pyro are required, the necessary addition must be made to the ordinary avoirdupois ounce-bottle. 2. The difference between the carbonate and bicarbonate has frequently been dealt with in our columns. The former is rarely kept by dispensing chemists, but it may be obtained from all dealers in photographic chemicals or from any operative chemist.

PHOTOGRAPHIC CLUB.—March 2, *Halation* and *Public Exhibitions*, by F. P. Cembrano, jun. 9, *The Oxyhydrogen Microscope*, by Mr. T. E. Freshwater, and *The New Incandescent Light*.

MESSRS. TAYLOR, TAYLOR, & HOBSON offer twelve and six guineas respectively for the two best negatives taken with their photographic lenses. The conditions of competition may be obtained from Slate-street Works, Leicester.

LIMELIGHT ENTERTAINMENT.—On the 15th inst. Mr. George Mason, of Glasgow, delivered his popular lecture, *Jack and I in Norway*, in the Patrick Free High Church. Sir Andrew Maclean presided. A good audience was present, and a cordial vote of thanks was awarded to the lecturer.

THE Ashton-under-Lyne Photographic Society held a very successful exhibition last week. The Society is only a year old, and numbers 190 members. In addition to the members, such men as W. L. Howe, J. Crooke (Edinburgh), W. W. Winter, W. D. Welford, R. Keene, G. W. Wilson & Co., Horsley Hinton, Rev. H. J. Palmer were represented on the walls, and there were lantern lectures by Paul Large, G. E. Thompson, and others. Want of space precludes us from entering into details of the exhibits, but we cordially congratulate the young Society on its success.

CONTENTS.

THE BRITISH
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No. 1661. Vol. XXXIX.—MARCH 4, 1892.

SLUM LENSES.

And why should there not be slum lenses as well as those for portraits, landscapes, or architecture?

A 'slum,' from our special point of view at present, may be considered as a narrow, darkly lighted court, with numerous squalid women and children grouped about the doors, especially during fine weather. Owing to the high surroundings and narrowness, the light which falls upon such groups is poor and attenuated, and hence, to obtain instantaneous photographs of them, a more than usually quick-acting lens is necessary.

For some time we employed for this purpose a small quick-acting Petzval portrait combination, having a rather round field; that is, one by which the oblique rays were brought to a focus on a plane nearer to the lens than the central rays. It is obvious that when, in naval phraseology, the court was raked by the camera, the sides of the subject were much nearer than the centre, and, according to the laws of conjugate foci, they would be brought to a focus on a plane approximating to that of the centre. But, as lenses of this class do not embrace an angle sufficiently large to give proper effect to this principle, we have concluded that every object is attained by the employment of one corrected to give a flat field. And, whereas a lens with a round field cannot be efficiently used for ordinary outdoor purposes, one with a flat field can. The balance of advantages is, therefore, to be found in the latter.

After a trial of several of the portrait class specified, we cannot find one in which a diaphragm can be inserted without a more or less pronounced flare spot resulting. We are now referring to outdoor, not studio, photography, and therefore it is important that for this purpose the portrait lens be employed with its full aperture, which, it need scarcely be said, is inimical to penetration, or, as it is popularly termed, "depth of focus." It is not considered necessary at present to give the optical reasons for the production of a flare spot when a stop is employed; it is enough to know that it is so. When a lens of this class is employed for the special purpose now before us, it should, as we have hinted, be one of sufficiently long focus to ensure its covering the plate to the margins with a degree of sharpness such as will not provoke comparisons between the margin and the centre; and this necessitates its being of more bulky dimensions than is sometimes desirable, and also precludes the possibility of getting near objects in, unless these are so focussed as to render the other portions subordinate to them.

The slum lens should partake somewhat of the character of the portrait combination in being able to define well with full aperture a narrow angle of included view in a weak light; but, to render it generally useful, it should, like the lenses of the rapid rectilinear type, be also capable of being employed with a small diaphragm without giving a central flare spot. This, we know, a portrait combination would do provided it were so shielded as to prevent the sky from having access to it, a condition almost impossible to be realised. Pending the advent of a lens which shall fulfil both conditions, we can only suggest for slum purposes the employment of one of the rapid cemented type.

This is a field of research which, when the season advances, will richly repay those who enter it. The picturesqueness of the groups there to be found is often such as to cause a slum photographer to produce pictures even when the pictorial or artistic instinct is almost wanting in the camerist.

DEVELOPMENT "THEORIES."

Although avowedly designed to submit for the consideration of his auditors the various hypotheses which have been made on the subject of the theory of development, the admirable paper by Mr. Adolphe M. Levy, which was recently read before the Photographic Club, and which will be found in another part of the Journal, nevertheless concerns itself in a distinctly practical manner with the applied branch of the subject, and within a brief space reveals its whole philosophy with such clearness and succinctness that, be the reader concerned with either its theory or its practice, or both, it would be difficult for him to rise up from a perusal of the paper without a feeling of intelligent satisfaction and, perhaps, profit. The sections of the paper dealing with normal exposure, under-exposure, and over-exposure respectively, concise as they are, would, in regard to accuracy and luminosity, be difficult to excel. For the beginner and the student their expository merits are as considerable as those of any previous contribution to the literature of the subject, which is saying much.

Mr. Levy discounts the value of discussing the "theory" of development by aptly observing that we know little or nothing about the nature of the latent image, which forms the basis of development. To that knowledge, slight though it is, he attempts no addition in the paper before us, nor can we gather that he himself favours any particular "theory" or "explanation" of the change induced by light on a gelatinous film of silver haloid. While fully appreciating this reserve in the first respect, we think that his paper would have gained in interest if, as a chemist of experience and competency, he had told us which of those "theories" (we use the term advisedly) struck him as being the most feasible, and therefore the one most worthy of attempted substantiation; for, until among experimentalists there is a commonly agreed basis upon which the rails of investigation and research may be laid down, it will be futile to look for either accepted proof or disproof of any one particular "theory" of the latent image.

But Mr. Levy possibly suggests the source of a clue to the mystery which has so long baffled photo-chemical investigators by premising that to his knowledge chemical action has never been said to take place between the silver compound and its vehicle during emulsification. Two facts, however, point to the assumption that such an action is tolerably probable—the first being that a film of pure bromide of silver, unenclosed by any vehicle, is far less sensitive to light than when incorporated with gelatine; and the second, that gelatine acts as a sensitiser, *i.e.*, an absorbent of liberated halogen at the moment of exposure. For aught that we know to the contrary, some true chemical reaction between gelatine and the silver haloid may take place during emulsification, the proof of which may conceivably be deduced from the circumstance that the mixture, when exposed to light, undergoes what is practically decomposition. Gelatine and pure silver bromide simply incorporated, that is, without emulsification, produce a mixture which, we believe, is far less sensitive to light than the emulsified product. If it is only a physical change which takes place in emulsification, it is hard to account for the fact that the developed photographic impression cannot be entirely removed from a gelatine plate, though to all intents and purposes every particle of the silver image is dissolved out. We suggest, as a probability, that the halogen-absorbing properties of gelatine are due to a chemical action which is set up between it and the silver haloid during emulsification, and that the precise nature of that action must be ascertained before the composition of the latent image can be known.

In glancing at the oxybromide theory of the latent image, Mr. Levy seems to be unaware that that theory, far from being recently introduced, was advanced many years ago by the late Thomas Sutton. This, however, is a fact of which modern writers may pardonably be ignorant. But it is greatly in its favour that the oxybromide theory should, *longo intervallo*, have been independently put forth by, we believe, Dr. Hopkinson, who in all probability was not aware of Sutton's writings. In this connexion we must confess to a feeling of disappointment, that Mr. Levy has quite neglected to notice the beautiful experiments of Mr. Carey Lea, endeavouring, and not, we think, altogether unsuccessfully, to establish the identity between what he termed the photo-salts formed by light on films of haloids in gelatine, and similar bodies prepared by chemical means. Certainly, in any disquisition upon of examination of the theory of the latent image, the omission of Mr. Carey Lea's work is a serious flaw; as to our thinking, the mass of evidence which he adduced in favour of his claim to have identified the reduction products of exposure on the silver salts, is greater and more weighty than that which has been urged on behalf of the oxychloride and subchloride theories.

The discovery of the nature of the latent image would, we have no doubt, be of more interest to experimentalists than to practical photographers, although it would be extremely rash to prophesy that the latter class would not ultimately derive direct benefit therefrom, as possibly that knowledge might enable us so to employ our reagents as to be able to develop all light impressions, however brief. At present our very ignorance of the nature of the reduction product probably operates as a barrier to the arrival of that consummation, although, from the number, variety, and range of power of the new reducing agents constantly being introduced, we are justified in believing that in the immediate future some appreciable diminution of exposures may be universally permissible.

We have inferred above that Mr. Levy's paper, in parts, is or much value from the point of view of those practically concerned in the art of development; but it also appeals with equal force to the student of theory, for whom it points a moral as obvious as it is useful. This is to preserve, on the much-vexed question of the composition of the latent image, a condition of open-mindedness and freedom from prejudice. In chemical science old theories have constantly to be rejected for new ones, and the study of the fascinating problem under notice is best approached in the mental constitution pointed at, which, however, so far as photo-chemistry is concerned, is at present, we are bound to observe, rather the exception than the rule.

COLOURED PHOTOGRAPHS.

Since our articles on this subject have appeared an important contribution to the question of the fading of pigments has been made in a paper read before the Chemical Society by Professor Hartley, F.R.S., on the acid action of drawing-paper of different makes, and which we shall shortly reproduce. It is only necessary here to briefly summarise the results of his investigations, which are to the effect that almost all hand-made drawing-papers of the highest quality gave acid reactions when suitably tested. They were not acid to ordinary litmus; but, when azolitmus was laid on with a sable brush like a water-colour wash, "such washes turned red upon the paper." Further, he found that the acid had such hold upon the fabric that many hours' washing failed to remove it entirely. It is obvious, therefore, that such paper would add another to what may be termed photographic dangers in the substratum of the drawing. It would, therefore, seem desirable that all photographs intended to be painted upon should, in their production, have a final wash of ammonia to neutralise any original acid or any absorbed during the chemical operations, and possibly held stubbornly by the fibres. This retention of acid is a most important consideration, and, if proved to take place with the acids employed in various paper processes, a factor that must be dealt with.

Leaving that point to be dealt with as each sees fit, it will naturally be looked for that we make some pronouncement upon the relative advisability of the general employment of body-colour or transparent, but it is impossible. To begin with, an artist insensibly leans to a certain style according to his surroundings and the school he attaches himself to. As to the relative permanency, there is no decisive evidence one way or the other. There is before us, as we write, a ten-by-eight silver print painted in water colour about thirty-five years ago. The background has been painted in transparent colour, and photograph and pigment alike have altered. The face, beautifully painted in body colour, has given way very little indeed, so little that, if the surroundings could be repainted, few would observe anything wrong. Here, body colour has stood and actually protected the photograph. On the other hand, we have lately seen carbon prints finished in opaque colour in which the carnations are gone almost entirely through the pictures, and but a dozen years old. Side by side with one of these we recently saw, at a professional photographer's, a picture practically finished in transparent colour, the same age, and perfectly fresh. But it is well known that simple water colours fade, and to such an extent that a Royal Commission was appointed to examine and report upon the subject.

But there is still to consider another method—that of finishing in pastel; and, as this style, especially since the

exhibition devoted to drawings done by it, has become of late very popular, it is evident that, if adapted to photography, and advantageous in other ways, its use should be popularised. It has every advantage; it is considered a method more nearly approaching the permanency of oil-painting than any; it covers well, beautiful effects are obtainable by it, and, if well done, the pictures are most effective. The colour, being carried by a body of inert powder, is not brought into close contact with the photograph, and so much of it is, in comparison, employed, that a slight amount of fading would be imperceptible.

Dealing, now, with the actual pigments employed, the course of our investigations has shown us that, owing, perhaps, to the need of a powerful colour in mixture to cover the dead opacity of the darks in a photograph, the colour crimson lake has been employed in a way no one would ever think of doing in ordinary water-colour work. Even for special touches in high-class work it is employed. Thus, in a popular manual upon painting photographs, we read: "For the darker touches and deeper shadows about the eyes and under the eyebrows, a little crimson lake or Indian red, or both . . . . . the lower lip with vermilion and lake or madder carmine." Now, we have to say that crimson lake is so utterly fugitive a colour that its use is highly improper in any flesh painting whatever; nor, indeed, would we recommend it either for drapery or adjuncts; it is sure to fade eventually. Recently some permanent red colours analogous to crimson lake, but more powerful, and therefore difficult to introduce, have been introduced. They are made from alizarine, and, we should consider, may safely be trusted where they can be used. For reds of the greatest stability in water colour, we have, as reds, Indian, Venetian, and light reds, and red ochre, vermilion being uncertain, and the invaluable madder colours, rose red, purple, and carmine, being less permanent. Ordinary carmine should be classed with crimson lake and banished entirely; scarlet lake also, which is only crimson lake and vermilion.

Among safe yellows may be included yellow ochre, raw sienna, orange cadmium. Pale cadmium is of doubtful permanency, and true Naples yellow should never be used. It is a seductive colour to employ, but most treacherous; it is certain to discolour, and at no distant time after being laid on. Chromes should not be used, they also discolour, and are dangerous to use without proper knowledge as to what can be safely mixed with them. For blues, ultramarine, artificial ultramarine cobalt, and cæruleum are available. Prussian blue is doubtful, and, unfortunately, indigo still more so. Most of the browns of the colourman are safe, madder brown and Vandyke brown being among the doubtfuls, and bituminous Vandyke brown quite unsafe. Ivory-black, charcoal-black, lamp-black, graphite, and Indian ink give a wide range for the production of greys, browns, and greens, and Chinese white is all that is needed for whites. Here is a tolerably complete list for any artist, and we may say, in conclusion, that, if no other result follow these articles than the banishment of crimson lake, carmine, and Naples yellow, they will not have been written in vain.

Medals.—Those members of the Birmingham Photographic Society who exhibit at their exhibition next month can scarcely escape honours. Twenty-six silver medals, a silver cup, two hand cameras, and *other valuable prizes*, as well as an unlimited number of certificates, are offered! The Birmingham Society is comparatively a small one, hence there is a possibility that every exhibitor may be a prize winner. Except to pot hunters, of what value can medals be that are obtained under such conditions?

Dissolution of a Society.—At a meeting of the Brighton Photographic Society on February 23, a resolution dissolving the Society was carried. It appears that, in addition to having a considerable balance on the wrong side, but little interest was taken by the members in the Society's welfare. We are informed that this dissolution is the outcome of negotiations which have taken place with the Brighton Natural History Society, of which the members of the late Brighton Photographic Society will in future be a photographic section.

Imperfect Marginal Definition.—Portability in apparatus now seems to be the order of the day, often to the derogation of the work. Particularly is this the case with many hand cameras. With the view to reducing the bulk, short-focus lenses that will not cover the size plate used are pressed into service. Consequently, when the image is enlarged, or, as a lantern slide, is projected on the screen, the want of definition at the margins becomes painfully manifest; whereas, had a lens of an inch or two longer focus been employed, this imperfection would have been obviated.

The Proposed Photographic Institute.—The *Daily Chronicle*, of Monday, contained a leader on this subject, in which it extended most gratifying support to the proposition. Our contemporary says that it was in response to the appeal of certain distinguished men of science that it gave prominence to the appeal. Be that as it may, our readers will find the views we set forth in our leader of February 19 reflected in the *Chronicle* article with a degree of fidelity little short of remarkable. Both the Photographic Society of Great Britain and photographers generally are to be congratulated on having obtained outside advocacy for the establishment of a Photographic Institute from our energetic daily contemporary.

Electric Light for Photographers.—The Pilsen Electric Company recently gave a demonstration of an electric lamp for photographic purposes, which, we understand, is already being successfully employed by several London and provincial photographers. The lamp, for which special carbons have to be provided, is fitted to a large concave radiator, which is swung on a lever that is actuated by a ball-and-socket arrangement. This allows of the system being placed at any desired angle, and consequently complete control is obtained over the lighting. The Pilsen lamp, we believe, can be worked by utilising the power now being supplied by the electric lighting companies along the principal thoroughfares of large towns; but, whether this or separate power be employed, the initial cost of an installation would be relatively small.

The Albumen Process.—Is the reputation of the albumen process for lantern transparencies in jeopardy? It would almost appear like it. Hitherto this process has generally been considered the very best of all for this class of work. Indeed, to pronounce a slide nearly as good as one by the albumen process was considered about the highest compliment that could be paid it. However, the recent competition at the Lantern Society has put another face upon the subject, for the best slide of each set was on collodio-bromide, by Mr. Ackland, while gelatine came second. Albumen figured low down in the list, being sixth, fifth, and fourth respectively; while, in two sets, collodio-albumen was last, and in the other only fourth. Even wet collodion made a better record. It might be said that the different processes were not well represented in their workers, but on this occasion, at least, this would not hold good. The albumen slides were by the firm of Levy, of Paris, and the collodio-albumen ones by Mr. Ackland, who may be looked upon as the former champion of the process.

Fading.—Attention is just now being given to the subject of the stability, or otherwise, of photographic prints by certain processes. In consideration of this matter it is desirable to separate the process itself from the material upon which it is worked. Paper, so far as colour is concerned, is well known to be anything but permanent. If it be exposed to light—a portion being protected for comparison—

in nine cases out of ten it will become discoloured, sometimes even in a few days. The discolouration is sometimes due to the material of which the paper is composed, and frequently to the colouring matter added to give it a fictitious appearance. Therefore the shortcomings of the paper should not be charged to the process. We were recently shown some photo-mechanical prints that had been exposed in a shop window for two or three weeks, which had become quite yellow in the lights owing to the change in the paper. In ordinary silver printing only the *Sare* and *Rives* paper are used, and both of these may be considered stable. But in other processes less high-class papers are generally employed.

Photographers' Benevolent Association.—At the annual meeting on Friday last the following officers were elected for the ensuing year:—President, Mr. J. Traill Taylor; Trustees, Captain W. de W. Abney, C.B., F.R.S., &c., and Mr. W. S. Bird; Treasurer, Mr. John Spiller, F.I.C., F.C.S.; Committee, Messrs. H. D. Atkinson, F. H. Berry, W. Bedford (Chairman), R. P. Drage, T. E. Freshwater, G. T. Harris, T. C. Hepworth, F.C.S., A. Mackie, E. W. Parfitt, J. S. Rolph, H. Snowden Ward, H. R. Hume, and F. W. Hindley; Honorary Secretaries, Messrs. H. J. Beasley and W. J. Tabrum (55, Chancery-lane, W.C.); Honorary Local Secretaries, Messrs. H. J. Walker (8, Broad-street, Bath), R. Keene (All Saints', Derby), J. Davie (186, Sauchiehall-street, Glasgow), J. B. Payne (Mosley-street, Newcastle), B. Howie (85, St. Giles'-street, Norwich), J. E. L. Brokenshire (48, Hotham-place, Millbridge, Devonport, Plymouth), T. S. Hicks (141, Cemetery-road, Sheffield), and J. Pyefinch (Mardol Head, Shrewsbury). The report and balance-sheet (to which we have already made reference) were adopted.

Profitable Overtime.—Our contemporary, *Trade, Finance, and Recreation*, in a series of articles on "Roads to Easy Fortune," has exposed a number of advertising frauds. A few weeks back it enlightened its readers on the pastel portrait business. Last week it dealt with another advertisement having reference to photography. "150*l.* given to any one finding our home employment not genuine. 25*s.* weekly easily earned at home, evenings, either sex, old or young, everywhere; for materials to commence work, send 1*s.*, —— & Co." Now, as some of our readers may possibly like to earn another five-and-twenty shillings a week by a little evening work, we shall tell them how it is to be done according to the shilling's worth supplied to our contemporary. If they do not take advantage of it, they may, at least, be amused. The articles supplied were a piece of common glass, about two inches square, an unmounted photograph, one inch by one and a half, of a lady, with very little on in the way of clothes; half an ounce of starch, and instructions for mixing it and mounting the picture on the piece of glass. The circular states that, when perfect, you can earn from twenty-one to thirty shillings a week without hindrance to any occupation you might have during the day. Sixpence per dozen is said to be paid for *cartes*, and ninepence for cabinets. Hence, one has only to mount a hundred of the former each evening to earn the promised twenty-five shillings.—*Eureka!*

Second-hand Apparatus.—The season is now approaching when photographers, professional and amateur alike, will be setting their apparatus in order—disposing of some with a view to replacing it with other of larger dimensions, or, maybe, of more modern construction, while others will be on the look-out for second-hand apparatus, in order to save a portion of what would be necessary to purchase new. Now a novice, seeing the latter, often makes a bad bargain, and finds, to his cost, that the lowest-priced articles are not always the cheapest in the end. Often apparatus is purchased on the strength of the reputation of the maker, and, frequently, quite regardless of the usage it has received since it left his hands—perhaps many years since. With regard to cameras and the like, the condition may generally be judged by a careful examination; but this is not always the case with lenses. It is often assumed that lenses, so long as the glasses are intact, do not deteriorate with age. This may be the case provided the instruments are not in constant use. If they are, however, the case may be different, and the difference will be dependent upon the usage they have received. If a lens happens to be dropped and no glasses are broken, no harm is supposed to be done; but the bruising of the mount may have caused sufficient jamming to alter the original figure of the lenses. Furthermore, careless wiping of the glasses, often done with the focussing cloth, tends to destroy the high polish of the glass upon which brilliancy of the image so much depends. It will be remembered that a few months back we directed attention to the subject of a small film of dust on the surfaces of the lens of a detective camera preventing brilliant negatives being obtained. Imperfect polish on the surfaces of a lens is just analogous to a film of dust, and has the same effect on the negative. These remarks are brought about by the recent examination of an old portrait lens by one of our first opticians. By careless usage the mount had become dented, and thereby strain put upon the glasses, the surfaces of which, by constant wiping, were rendered dull and grey. The consequence of this is that a lens, which was once an excellent instrument, is reduced in quality to that of one of second or third-rate foreign make.

RATIO OF GRADATION.—I.

The discussion that has been going on for some weeks past on the subject of Messrs. Hurter & Driffield's experiments and their deductions therefrom has a peculiar interest for me, as some years ago I attempted an investigation in much the same direction, but was compelled to reliquish it owing to the magnitude of the task. The conclusions at which these gentlemen arrive are so subversive of some of the pet beliefs of photographers, and so apparently contrary to the daily working experience of hundreds, nay, thousands, that the question may well be further ventilated.

Before examining closely into the facts, it is, however, desirable to clear the ground of one or two obstructions in the shape of matters that may give rise to misunderstanding. In the first place, with regard to the formulæ and method of development, I have not been able to obtain the full text of Messrs. Hurter & Driffield's communications, and am therefore confined to what information I have been able to gain from some of your correspondents. But, as far as I can see, a "normal" developer has been employed, with variations of a not very pronounced character, and the action has been continued to the utmost, or, in other words, the most has been "got out" of each plate. The exposures, too, I take it, have been also of the "normal" character, that is to say, such as would give a properly graded image with any of the usual developing formulæ.

Secondly, there is the difference in meaning of the word density as used by Messrs. Hurter & Driffield, and as understood generally by photographers. In the first instance, it is applied to the quantity of silver deposited upon a given area of the plate; in the second, to the degree of opacity or printing value of the different gradations. At first sight the distinction is not very clear, for it would be supposed that opacity and density of deposit meant one and the same thing. As I take it, Messrs. Hurter & Driffield mean to say that such is not the case, or that opacity does not increase in the same rate of progression as the density of the silver deposit.

With regard to this last point, I think there cannot be two opinions as to the correctness of their view. If it were otherwise, to use an *ad absurdum* argument, it would be possible, *in time*, to produce a photographic impression through any obstruction, however thick—a brick wall or an armour plate, for instance. But we need not go to such extremes, but simply study any simple actinometer scale, made by building up increasing numbers of layers of tissue paper or similar material. If the opacity varied directly with the thickness of the obstruction layer—the density of Hurter & Driffield—then the values of the successive gradations would bear a regular relation to one another; it might be 1 : 2 : 3 : 4, &c., 1 : 2 : 4 : 8, or 1 : 3 : 9 : 27, &c.—at any rate, it would be regular. But is this so? In my own experience, certainly not; I have never yet found any form of actinometer screen that followed such a rule. The Warnerke scale is supposed to do so; but, even in the best examples of it, it is very doubtful whether the gradation is even approximately accurate.

That increasing the density of the deposit—in the sense of Hurter & Driffield—increases the opacity or power of stopping the light, "printing value"—call it what you will—in a greater relative degree

is easily demonstrated. Take two extremely thin transparencies from the same negative and superpose them, then view the combined picture by transmitted light, and the apparent increase of density (in the sense of opacity) is far greater than an examination of the separate images would lead one to suppose. Again, to take a very familiar instance, how very faint—to the eye—appear the strokes of the retoucher's pencil on the negative, yet what a marked effect they have on its printing value.

If we look, then, at the subject of ratio of gradation, bearing in mind the distinction thus made in the application of the term density, it is not impossible that Messrs. Hurter & Driffield may be right in their deductions. Of two negatives of the same subject developed differently, one may possess twice as much *contrast* as the other when put to the printing test, although the ratio of gradation is precisely the same in both. It seems to have been assumed by some of those who have taken part in the discussion that similarity of gradation implies identity of printing effect whatever the density of the deposit may be; but this is far from being the case, as can, I think, be easily shown.

Let us suppose a very thin negative, in which the relative densities of the lowest and highest gradations are represented by the figures 1 and 4 respectively, and two of the middle tints by 2 and 3. Then, taking 0 as clear glass, we have a series in arithmetical progression, 0, 1, 2, 3, and 4, representing the full gamut of the negative from deepest shadows to highest lights. But the limit is too narrow to give printing value, the steps in this scale are too minute to be appreciable, or, at least, to give the necessary contrast. But let us imagine the image to be further developed, until, according to Messrs. Hurter & Driffield, the values are doubled, and the same gradations are represented by the scale, 0, 2, 4, 6, 8. The ratio of gradation remains precisely the same, but it will be noted that there is twice the interval between high lights and shadows and between the different gradations, and that therefore the contrast has been increased, and the previously inapplicable differences have now received a printing value. Here, it seems to me, is where the first misconception exists, namely, that to alter printing value or contrast it is necessary to change the ratio of gradation.

Looking at the fact, as has been pointed out, that everything depends upon the effect produced by the original action of light, it is difficult to conceive how the result of normal or correct development could be otherwise than the production of a definite and regular series of gradations directly dependent upon its varying degrees of force. When the developer commences to act, a number of molecules of silver bromide are reduced the more closely, or the greater number in a given space, according as the force of the light's action has been stronger; each of the molecules first reduced transmits the action to another, and that again to another, until the limit of the effect has been reached; and so the reduction proceeds regularly, and in proportion to the original force set in motion. This is the boundary line of legitimate development; if it be continued further, the reduction that takes place is irrespective of any effect of light, and occurs uniformly over the whole surface of the plate, and then it is that the ratio of gradation of the image is altered. For, suppose by forced or over-development a reduction takes place, it will have the form of a uniform veil over the whole image, and, setting its density value down as equal to 1, we must add that number to the value of each of the tints produced legitimately, with the result that the series 0, 2, 4, 6, 8, becomes 1, 3, 5, 7, 9, in which it will be observed there is no "deepest shadow" or clear glass, and all the other gradations are brought proportionately closer together, producing flatness. Contrariwise, if the development is stopped too soon, or before it has produced the full effect possible with the exposure, we must make a deduction all round from the values of the gradations, with the result that there is a superabundance of shadow and general heaviness.

It is obvious that the developer takes some time to perform its work, and that that time depends upon the force of the light's action; or, in other words, that reduction is more rapid in the higher lights or when the action has been strong than in the shadows when it has been much weaker, or perhaps scarcely appreciable. If it were not so, the formation of the image in all its gradation would take place instantly, as soon as the *vis inertiæ* of reduction was overcome, or the development commenced. But what is the fact? First the high lights appear, and as these gradually gather strength the half-tones are brought out and finally the shadows, and upon the correct adjustment of the development to the exposure depends the possibility of bringing out the faintest radiations before the high lights have acquired too much force. For every variation of exposure there is a variation in development necessary, but Messrs. Hurter & Driffield say that with a given exposure no possible variation of developer can alter the result so far as gradation is concerned.

This brings me back to the conditions under which they appear to have worked, namely, with the conditions normal and using the developer to the full extent of its legitimate power. This being the case, it is no wonder that the result as regards ratio of gradation is invariable; for, if a developer of medium power produce a certain result when pressed to its legitimate limit of utility, a stronger or a weaker will, as I have shown, only alter matters proportionately. But let the development be carried further than what they consider its proper limit, or let it be stopped before it has expended its full power, and alteration of ratio at once commences. If, as I believe, Messrs. Hurter & Driffield have ignored variation in time of development, they have overlooked one of the greatest powers the photographer possesses.

I have already said that the rapidity of the reduction depends upon the relative force of the light's action on various portions of the image; but naturally it is affected quite as much by the strength and character of the solution, and more still by the combination of the two factors. What I mean is that, whereas a developer of normal or medium strength may take three times (say) as long to develop out a faint shadow than it does to produce the high lights for negative, a weaker solution may take perhaps six times as long, or a stronger only twice as long. Obviously, unless such different developer be permitted to act to their full extent, they must exhibit some sort of abnormal result as measured from Hurter & Driffield's standpoint; in other words, they must, if they do not alter the ratio of gradation, at least "change the pitch," so to say, of the image by raising or lowering it on the gamut of tones.

For instance, let us suppose we have two similar plates exposed to the same subject under like conditions, and, on developing one with a normal developer, we find it much over-exposed, incapable of being brought up to printing density, and altogether wanting in contrast. What do we do with the next? Well, most likely strongly increase the dose of bromide and reduce that of the alkali. But, say Hurter & Driffield, "the result will be the same; you will have the same ratio of gradation, but greater density." So we might if we used each developer to its full power; but suppose we stop the second developer when it has only half performed its work. We shall find that the high lights have forged ahead, being comparatively little affected by the extra check, and, owing to the slowness of the development, have had time to acquire some density; the half-tones come on gradually, gaining strength as they grow, while the fainter shadows, and, above all, the veil or fog that overspread the first plate, are kept back still more. We have no wish that they should appear, so we arrest development just before their time comes, and so secure a result that, if not perfect, is still much better than the first. This is what the practical photographer does every day, and calls it "latitude in development."

Whether the ratio of gradation can be considered to have altered in this case, or whether the image has simply been pushed higher up the scale, may be argued by those who choose; but this seems one proof to me that, right or not right, Messrs. Hurter & Driffield's theory does not interfere with the photographer's pet idea of latitude in exposure.

W. B. Bolton.

CONTINENTAL NOTES AND NEWS.

Photography in Colours.—M. Louis Ducos du Hauron writes to a French contemporary to point out that Mr. F. E. Ives's method of obtaining coloured lantern positives by superposition of different coloured pictures was anticipated by himself and M. Charles Cros so long ago as the year 1869. He therefore claims that it is a purely French invention, which has only been copied in America.

Cresco-Fylma.—The *Photographic Gazette*, in which this

communication appears, goes in for a little attempted patent smashing on its account. After ridiculing the claims for novelty of this method of enlarging made by one of our English contemporaries, the *Gazette* informs us that the process in question is described in its pages for March 25, 1891, the inference, of course, being that the English inventors have been anticipated. Apparently all good things are invented in France, in which country, by the way, the victors of Waterloo are said by some people to have been born.

Another New Developer.—Dr. Eder is at present experimenting with a new developer, which he calls Metol, a substance with which he associates glycerine. It is said that this mixture surpasses in energy all developers known, and that it keeps better than them. Next, please!

Pyro an Antidote for Nicotine.—So says Dr. Gautelet, who recommends placing a pledget of cotton wool, impregnated with a ten per cent. solution of pyrogallic, in the bowl of the pipe, which will neutralise the nicotine condensed there. But a critic of the dodge—probably a member of the Anti-Tobacco League, and therefore hopelessly prejudiced—suggests that the best way to avoid the baneful effects of nicotine is simply—not to smoke.

Mica for the Carbon Process.—Sheets of mica, coated with bichromated gelatine, are now stated to be on the Continental market, thus obviating transference. It is said that the sheets are saleable in various sizes from 9 × 12 c.m. to 180 × 240 c.m. We do not know if the idea is a "patented" one; but, if so, as we pointed out in an article on the subject some weeks back, its validity is doubtful, as the application to mica for this purpose is not at all a new one.

Monument to Petzval.—The Photographic Society of Vienna has taken the initiative in raising a subscription for the erection of a monument to perpetuate the memory of Professor Petzval. The Society has opened the list with a donation of 1070 francs. Remembering the enormous services which this illustrious *savant* rendered to photographic optics, and in which this country has been as large a participant as any, we commend the project to English photographers and opticians, in the hope that they will not allow themselves to be unrepresented in the subscription list.

Souvenir of the Vienna Photographic Exhibition.—A superb album, containing thirty-seven photogravures of pictures, shown in the late Vienna Photographic Exhibition, has just been issued, English photographic art being represented by Mrs. S. Frances Clarke and Messrs. A. Burchett, Adam Diston, P. Lange, R. W. Robinson, Lyddell Sawyer, Ernest Spencer, F. H. Worsley Bennison, and A. R. Dresser. The art portion of the descriptive text is contributed by Herr Jacob von Falke, Dr. Eder being responsible for the technical details supplied. We hope our compatriots will not be unduly puffed up with pride at having their work shown among that of an Archduchess, a trio of Barons, a Countess, and a Prince!

Camera Positives.—M. P. Cardin, in *Cosmos*, publishes a method of obtaining positives direct in the camera on "ordinary negative paper." An exposure of from five to ten minutes, with a large diaphragm in full sunlight, is given, a weak developer being employed to develop the image, the details of which are already visible. It is said that a dark room might be dispensed with in development, provided that the operation be conducted in "the shade," the dish being covered. The picture is, of course, reversed, but this disadvantage disappears with pellicular supports. This "method," as our readers are aware, is founded upon the phenomenon of "solarisation," or "reversal."

Snow Statues Photographed.—During the recent severe weather, M. Buls, the Burgomaster of Brussels, devised a novel means of helping those who suffered most from the arctic inclemency in the Belgian capital. He appealed to a number of sculptors to decorate the principal walk of the Brussels Park with snow statues, an invitation that was most readily responded to. Admission to view the statues was by payment, which produced a sum of 11,000 francs. Among the subjects selected for treatment by the artists were bears, Pierrot and Pierrette, a bust of H.M. the King, &c. Photographs of these snow statues were taken by M. Alexandre, of Brussels, and reproduced in the *Bulletin* of the Association Belge; and they form a highly interesting memento of a novel experiment, which may be commended for imitation on this side of the Channel when opportunity—that is, a bounteous snowfall—next offers.

Taxing Amateurs.—Herr Brand, a Viennese photographer has suggested to the Finance Minister of his native country the levying of an annual tax of twenty-five florins on amateur photographers; but, the Minister having closed his eyes to this seductive idea for increasing the revenue, the aggrieved Herr Brand has delivered himself of a long letter to the Vienna *Tagblatt*, in which he lays bare his reasons for his suggestion. These are, of course, that amateurs are the ruin of professional photography, &c. He admits that there are some amateurs out of whom professionals make a profit, but these, he says, are in the minority. He bitterly complains of those who lend their cameras to friends, and who employ photography for commercial purposes, thus taking the bread out of the mouths of the ill-used professionals. He believes that a tax would change all this, by discouraging the employment of the camera amongst amateurs, and so bringing back a great deal of work to the professional. Herr Brand seems to have succeeded in nothing so much as getting himself well laughed at for his pains.

ON THINGS IN GENERAL.

With the Editor's permission I should like to make some comments which, I am afraid, cannot be made brief, on a subject of great importance—a letter on the 5th ult. from Mr. M. J. Michael, and Messrs. Hurter & Driffield's reply to it; for, from the absence of further response from the former, and the statements made by the latter, each correspondent seems ignorant of what these two experimenters did say in their paper. Let me at the outset say that this paper, read before the Society of Chemical Industry, is a monument of clear investigation and experiment which I, for one, value most highly; but, while giving all honour to its writers, I think it undesirable the facts should be obscured. The greatest investigators are liable to error, but it is not often that they betray such ignorance of their own work a short time after its publication as do these authors in this instance.

Mr. Michael's letter and Messrs. Hurter & Driffield's reply may, for the present purpose, be summed up in the following quotation from that reply: "Mr. Michael is, apparently, under the impression that we hold that the ratio of gradation is unalterable, not only by modifications in the constituent parts of a developer, but that it is invariably the same whatever the developing agent employed. The former we do hold, the latter we do not. In our original paper we distinctly say: 'There is a theoretical possibility that a plate may be rapid to one developer and slow to another, so as to require different exposures, according to the developer used.'"

Let us go to the original paper, as reprinted from the above Society's *Journal*. The unfortunate point about quotations is that they may be said to be garbled. I endeavour to give the just context, and I refer those interested to the quoted portions by indicating the page. The italics are my own. Page 6: "If two different densities be developed upon the same plate to their extreme limits, the ratio existing between the limits must depend solely upon the action of the light. The question we have now to consider is whether it is possible, by *any modification of development*, to influence this ratio." Page 7: "The results clearly show that the ratio of densities is given by the light alone. . . . . This ratio, we find, is *altogether unalterable*. No modification we have made in developers or development has ever seriously disturbed this ratio of the densities." A "Manchester Slow," having received three different exposures, was cut into four portions; two were developed with hydroquinone, and two with

eikonogen." Page 8: "The result"—other plates being used (F. L.) - "is extremely interesting and important, since it shows that the ratio between the various densities is identically the same *whatever* developer is employed, except in the case of eikonogen, in which the ratios are a little different. . . . . These experiments all confirm the statement that the gradations of a negative, as expressed by the ratio of the densities, are independent of the time of development, cannot be affected by alterations in the composition of the developers, and are almost *identically the same, whatever developer* is employed. We are thus driven to the conclusion that the photographer has no control over the gradations of the negative . . . . by no means at his disposal can he alter the ratios existing between the amounts of silver reduced in the various parts of the negative; they are regulated entirely by exposure."

How, after these portions of Messrs. Hurter & Driffield's paper being brought forward, can they say they "do *not* hold" that "the ratio of gradations" "is invariably the same, whatever the developing agent employed?"

I do not at this stage wish to complicate the plain point at issue by endeavouring to prove that the universal practice of photographers to alter the ratios by modifications or changes of development is founded on possibilities. For the present I simply state, as an expression of personal opinion, that the ratios can be changed at will.

The remarks in my last upon the wise provision of the Editor in supplying in the ALMANAC tens of thousands of instances year by year, to show the liability of bromide prints to fade, or otherwise, were quickly taken up, and at a meeting of the London and Provincial Photographic Association it was pointed out that some ALMANAC pictures had faded. Afterwards, a good explanation was given why some had faded, and it must be admitted that almost any process, if worked improperly, may give fugitive results. But, at the same time, no process will readily obtain a good reputation unless a disclaimer is made before fading has made itself evident. Bromide prints are very valuable, but no photographer has any justification whatever for representing them as absolutely permanent, and he who does so, in my opinion, dishonestly handicaps those who, at greater expense, issue prints that can justly be entitled permanent.

Those interested in lantern matters who have not read the description, by Mr. H. Brier, of the method of testing the stability of gas cylinders after their power of withholding pressure has been proved, should look up their back JOURNALS and read that gentleman's letter on page 126. When chains and cables are tested as to their ability to stand certain strains, the question has been often raised as to whether the testing itself may not have reduced the strength; but as to the cylinders no question need arise. The extremely ingenious method described enables any ordinary workman to ascertain whether or no a permanent stretch has been given to the metal.

I feel it desirable to call attention to a letter recently published in these pages, recommending a method of calming the surface of water when covered with ripples. The plan was to throw oil on the surface, and so still the waves. This is, indeed, a retrograde plan. When I have a view to photograph in which important objects are reflected in a lake or pond, it is always my aim to partially destroy those reflections, for nothing is more hideous to the artistic eye than to see a handsome building, for instance, so reflected as to show all its details below as well as above the horizon. No, instead of stilling waves, let me recommend that they be produced, and, if a sheet of water "reflects beautifully," let the photographer pitch a stone therein just before taking off the lens cap; the view will be twice as valuable.

FREE LANCE.

CARBON PRINTING.*

RAPIDITY, COST, &c.

As regards speed of printing and working, compared with other processes, I find it pretty quick working, decidedly quicker than ordinary sensitised albumenised paper. In the rather poor daylight of December and January, working in the shade of a building, the average time of exposure in the printing frame seems to be about twenty minutes for each "tint" of the actinometer required—that is, for a negative requiring two actinometer tints, forty minutes; one requiring four tints, one hour and twenty minutes; but, in the brighter weather of summer, and with white fleecy clouds in the sky, the time will be reduced to half that. I am convinced that, in dull weather, in the best part of a winter day, it is comparatively easy to make prints from dense negatives in one hour and a half, which would take a whole day, or even two days, with platinotype or weakly silvered albumenised paper.

Speed of work in development will depend mainly on one's appliances and method of working, but in my own case I can develop and finish off half a dozen 12 × 10 prints (including the time taken to heat the water to 96° in one hour and a half.

Perhaps it may interest you to know something about the cost of production, and I consider carbon work one of the cheapest processes we have, provided no waste prints are made; but as the element of waste is common to all processes if sufficient care is not observed, carbon work is not singular in that respect. As I said before, when once the correct actinometer time has been ascertained by the experiment, all subsequent prints from that negative ought to be a certainty, and therefore no waste prints ought to be made. I find for my size of print (11 × 9) the cost of production (apart from waste) is about three shillings and sixpence per dozen. There is no chemical required except alum, and that is so cheap as to be outside of calculation; only hot water is needed, and the glass supports can be used over again indefinitely if care be taken against breakage. Calculations made for whole-plate and half-plate negatives should come at about 2*s.* and 1*s.* per dozen, and ought not to exceed 2*s.* 6*d.* and 1*s.* 6*d.* respectively. Those who work much in bromide or platinotype at present prices, can tell for themselves what difference they find.

Finally, I think that if you will give the process a trial, you will be so pleased that you will probably take it up with as good results as any other process you may have tried. To me, one great point of its appreciation is the knowledge that the prints are permanent; as beautiful in quality as platinotype, and at far less cost of production.

GEORGE BANKART.

* Concluded from page 136.

THE "THEORY" OF DEVELOPMENT.

[Paper read before the Photographic Club.]

AMONG the numerous operations connected with the production of a photographic picture, all offering special points of interest, there is none which possesses the same fascination as the development of a negative. No item in photographic manipulation has originated more discussion in the technical Press, or at the meetings of Photographic Societies, and still we are bound to admit that little more is known about the actual transformation which the silver haloid undergoes during exposure than what had been already suggested by the earlier observers.

Our subject for to-night bears to my mind a somewhat misleading title. How are we to discuss the theory of a phenomenon when we know little or nothing about the nature of the latent image, which forms the basis of development? A scientific theory is essentially based on well-established facts, and no speculation deserves the appellation of theory which does not satisfy this requirement. There is probably no word in the English language which is more often misused than the word Theory. What has often been called "Scientific Imagination," is put forward as a theory. Is there any wonder that occasionally theory of this kind disagrees with practice?

In opening this discussion, I cannot pretend, therefore, to lay before you a theory. All I can do is to submit to your consideration the various hypotheses which have been made on the subject, none of which may represent the actual truth, however well they may appear to explain the phenomena observed during the development of the negative image. Before entering on the question of development, we may profitably examine the material we have to deal with, and give a few minutes to the nature of the film, which carries the latent image we are about to develop.

FORMATION OF THE LATENT IMAGE.

Negative films are composed of silver haloids, suspended in an organic vehicle, which may be gelatine or collodion. In the case of the modern dry plate, bromide, sometimes with a small proportion of iodide of silver, is emulsified in gelatine. As far as I have been able to ascertain, no writer on this subject has ever hinted that, during the process of emulsification, any chemical action took place in which the organic vehicle, gelatine or collodion, was involved. In all cases, the sensitive part of the film is admitted to be solely composed of silver haloids. The action of light on the sensitive salts of silver has never been determined, so as to leave no room for doubt as to the nature of the transformation which takes place during exposure. Though the existence of the sub-bromide of silver has never been proved, and, indeed, does not seem in accordance with the teachings of the atomic theory, the time-honoured hypothesis of a sub-bromide of silver being formed by the action of light on the normal bromide has been handed down from text-book to text-book.

Of late, the fact that the presence of air and moisture seems to have a certain influence, has led to the presumption that an oxybromide

of silver might be the result of the action of light. However, this has not, so far, been substantiated. One thing seems to be certain, the formation of the latent image is a chemical process and is not due to mere physical action. It has been established, without doubt, that when light acts on one of the silver haloids, part of the contained halogen is evolved. This is amply demonstrated by a very elegant experiment, due to Professor Meldola, and which was shown by him at one of his lectures at the Royal Institution.

It had been suggested by some observers that part of the haloid having lost its halogen by exposure to light, the residual product was a mixture of unaltered haloid with reduced silver. The fact that silver chloride, immersed in strong nitric acid, darkens when exposed to light, shows the fallacy of this assumption.

Whatever the case may be, we known that chemical decomposition has taken place, and that a certain portion of the silver haloid has been transformed, yielding what we will call, in our ignorance of its nature, a "reduction product." It is this reduction product which, submitted to the action of suitable chemical solutions, yields the nucleus of the developed image. It must be noted, however, that the quantity of silver bromide which has been transformed during exposure is very minute indeed. The silver reduced from it would be totally insufficient to account for the quantity of metal present in the fully developed negative.

Causes of Density.

Every photographer is aware that, if the developer is washed off as soon as all the detail in the picture is visible, the plate, on fixing in the usual way, will show the merest ghost of an image. It is only by a prolonged action of the developer that density is obtained. This affords ample proof that density is not the result of the exposure alone. The balance of the silver forming the image must, therefore, be sought from some other source.

Ammoniacal pyrogallol dissolves a minute proportion of silver bromide from the film, but certainly nothing like the quantity necessary. There is no doubt that the surplus metal is derived from the unaltered bromide in the film, which, under the combined action of the developer and of the metallic silver reduced from the modified bromide, decomposes in its turn.

A classical experiment by Captain Abney shows conclusively that the accretion of density is derived from the haloid remaining in the film. An exposed gelatine plate was coated with colledion emulsion on one-half of its area. It was then developed, and the portion covered with collodion emulsion proved to be denser than the other half. On stripping the collodion film, the image was found to be impressed on it also. This certainly indicates that an action has taken place during development, which has affected silver bromide, which had not been exposed to light. This phenomenon has been explained by an action which should take place between the silver reduced by the developer at the start and the unaltered silver bromide. An electro-chemical action is set up according to this hypothesis, in which the silver in a nascent state would form the cathode of an electric couple, in which the anode would be constituted by the silver bromide in the film. This hypothesis has in its favour the fact that it has been possible, by imbedding minute particles of silver in a wetted gelatine bromide film, to make these the nuclei of progressive development in a plate which had not been exposed to light. The conditions under which this experiment took place were such as to preclude the results from being ascribed to the effect of pressure, or, as it is called, "shearing stress." Following out, however, this electro-chemical hypothesis, it is necessary that a sufficient quantity of reduction product should have been formed by light all over the picture. If the silver deposited from this reduction product is not in sufficient quantity, the potential of the metal will not be sufficiently great to overcome the resistance which silver bromide offers to decomposition.

It has often been said that, however short the exposure, we ought to be able to develop the picture. Unfortunately, the means we have at our disposal are not, so far, powerful enough to cope with very much reduced exposures, and there is no doubt that it is absolutely necessary that the action of light should have lasted long enough to effect the reduction of an appreciable quantity of silver haloid even in the deepest shadows of the picture.

If the reduced silver, set free by the first action of the developer, be in too small a quantity, the image fails to build up, so as to attain the required density. In other words, in the parts of the negative which have been less brilliantly illuminated, only faint indications of detail, or even no trace of an image, are obtained. This is the case in an under-exposed negative.

The Function of Gelatine.

The phenomena produced by over-exposure are of a very much more complex nature. In order to arrive at a satisfactory explanation of the facts observed, it will be necessary to say a few words on the function of the gelatine which holds the silver bromide in suspension. Silver bromide obtained by precipitation, and exposed to light in a state of purity, is not very sensitive. If, however, it is placed in contact with a substance capable of absorbing the liberated bromine, the sensitiveness to light is enormously increased. The bromine, or, in general, haloid absorbents, are of various kinds, according to the process adopted in preparing the film. They are usually termed "sensitisers." In the Daguerreotype plate this function was filled, to a certain extent, by the metallic surface of the plate. In the wet-collodion process, the free nitrate of silver, which remains in the film, absorbs the bromine set free by the action of light. Lastly, in the gelatine dry plate, the gelatine is the sensitiser. The quantity of reduction product, formed by light in a given film, will be, within certain limits, proportional to the duration of the exposure. The gelatine will continue absorbing the liberated bromine till it becomes saturated with the halogen. At that moment, the brominated gelatine seems to have the property of rehalogenising the reduction product, so as to transform it back into normal bromide. This action may proceed far enough to reconvert, in the more brilliantly illuminated parts of the picture, the greater portion of the reduction product. On development, the high lights are thin or even transparent. This is what is termed solarisation or reversal. If a plate has received a sufficient exposure in the camera, the high lights of the picture may give, on development, a positive, instead of a negative, image. This reversal, however, need not necessarily be complete. Part of the reduction product may have been reconverted, the remainder being still capable of development. It is now easy to understand why an over-exposed negative should be one rendering all the detail in the subject, but which is flat, wanting in contrast, and thin as regards printing density. Meldola, in his *Chemistry of Photography*, draws attention to another very important fact, which, to my mind, throws some considerable light on the appearances observed during the development of an over-exposed plate.

Gelatine which has absorbed a considerable amount of bromine, set free by the silver salt in the film, becomes very much less permeable to aqueous solutions. Of course, when we speak of a "considerable" amount of bromine, we mean relatively to what would have been evolved during a normal exposure.

This being the case, the developing solution will not permeate the high lights as rapidly as it does the less exposed parts of the film. Development, therefore, proceeds more energetically as regards accession of density in the shadows than in the high lights. If, at the same time, we consider that the partial reversal of the high lights may have taken place, leaving less reduction product, it will be easily understood why the image should be thin and wanting in contrast. In fact, under certain circumstances, a strong developer yields a positive, when a weak one would have given a negative, image.

Nature and Influence of Reagents.

We have now endeavoured to explain the action which takes place during exposure and development. We have next to consider the nature of the chemical solutions used, the influence of each constituent on the final result, and, last of all, to examine whether the various hypotheses made are in accordance with the actual practice of development, as carried out by photographers.

Leaving on one side iron development, which appears to allow of much less possibilities than what has been termed alkaline development, we may define a complete developer as constituted by three factors, viz., a reducing agent, an accelerator, and a restrainer, these three chemicals being compounded in variable proportions according to circumstances of exposure, nature of subject, as also to the effect desired.

I think we may take pyrogallol as the type of the reducers generally in use, hydroquinone and eikonogen having the same mode of action, the only difference being in the relative energy of the last-named bodies. Pyrogallol in a neutral solution has but little energy as a reducer, and still less if in an acid solution. If, on the contrary, an alkali, such as ammonia, is added to it, it becomes a powerful reducer, of which the activity increases, in a certain measure, with the degree of alkalinity in the solution. Alkaline pyrogallol can be prepared that will instantly decompose the silver bromide on an unexposed plate, and produce what is called chemical fog. In the developer it is the pyrogallol which both develops and gives printing density. The other elements simply modify its action.

If a soluble bromide, such as potassium or ammonium bromide, is added to the developer, the alkalinity of the solution can be increased considerably without inducing fog. This is of great value when, in cases of under-exposure, a very energetic developer must be used to force out detail.

The soluble bromide appears to form, with silver bromide, a double salt, which, though still capable of reduction, is much less easily

reduced than the normal salt. This property of soluble bromides in the developer enables the photographer, as we shall see later on, to overcome certain difficulties which, without it, might prove unsurmountable. Pyrogallol and ammonia, used alone, will, in many cases, attack the unaltered haloid in the plate before the development of the latent image has had time to be completed. An admixture of soluble bromide lessens this evil to a very great extent, and, in fact, with some plates, cannot be dispensed with. It must be borne in mind that, with an exposed plate, it is very difficult to avoid a certain amount of decomposition in the unused bromide, if the developer employed be very strong.

The aim of the operator should be to reduce only that part of the haloid which has been modified by light. The developer should not decompose directly the unused bromide of silver. This, as we have already said, should be reacted on by the deposited silver, so as to form a fresh quantity of reduction product, which, being in its turn attacked by the developer, yields the increased density of deposit sought for. The alkali, or accelerator, simply increases the energy of the reducer, rendering its action more rapid, more searching, so as, in many cases, to enable one to force out insufficiently impressed detail. We will now examine what takes place in the three well-known varieties of exposure, and endeavour to see, at the same time, how facts agree with the explanations suggested:

Normal Exposure.

Every part of an illuminated object reflects light of an intensity proportional to that which it has received, subject to certain conditions of colour and nature of surface. In the special case of photography, we have only to deal with the actinic intensity of the reflected light, and this is, unfortunately, very much more influenced by the colour of objects than the visual rays. A normally exposed negative would be one in which each portion of the subject would have impressed itself proportionally to its actinic value, or, in other words, a negative in which each degree of light intensity would be represented by a strictly proportional quantity of reduction product. This definition, I need not say, is never realised in practice, but approximations can be obtained to this ideal, and these constitute the simplest case of development. In dealing with a correctly timed negative, the main object should be to avoid any veiling or fog. The introduction of this defect would at once destroy the advantages of correct exposure, and would affect seriously the scale of gradation in the picture. A slight veil may make little or no difference in the high lights, while it would be very perceptible in the half-tones, and still more so in the shadows. A veil is sometimes said to be an advantage in printing thin negatives. I do not think, however, that it should be introduced during development. There are plenty of means of doing this after the negative is finished. This being the case, a developer must be compounded which will do its work with relative rapidity, so as not to leave time for the unaltered haloid to be attacked by the reducer. It will contain the full amount of alkali, and a small amount of soluble bromide to keep the plate clear. Of course, the pyrogallol is varied according to the nature of the subject. What is alluded to here is always the quantitative ratio between the alkali and the reducer. Development proceeds gradually, though rapidly, each portion of the image building up proportionally to the exposure it has received. In this hypothetical case, the shadows possess the required density when the high lights have become sufficiently opaque. I need not say that a correctly timed negative is the exception; photographers generally prefer to expose fully, as development allows of a certain latitude in this matter.

Under-exposure.

In a negative of this kind, the high lights are fully impressed; the shadows, on the contrary, have not received sufficient exposure to form the requisite amount of reduction product. I have already pointed out that, with our present means of action, it is indispensable that a certain quantity of the reduced haloid should have been formed by exposure. If this is not the case, the metallic silver liberated by the first action of the developer will not be sufficiently abundant to start the electro-chemical action on which the building up of density is dependent. If the case of under-exposure is not hopeless, there will be, however, a small proportion of reduced bromide even in the deepest shadows, and this will develop, though very slowly, and at a rate which will not keep pace with the gain in intensity of the more brilliantly illuminated parts of the picture. If such a negative were developed in the ordinary way, the high lights would be absolutely opaque before the shadows had even started development. And, on account of the short exposure, it is indispensable to use a strongly alkaline developer to bring out what detail may exist in the shadows, or, in fact, to start action in them. We are thus placed between two equally unfavourable cases. Either we get a negative with high lights of printable density, and patches of clear glass for the shadows, or we obtain better-rendered shadows, with the high lights entirely opaque and therefore devoid of detail. In both cases the result is useless as far as picture-making goes. We have, however, a means of producing a more harmonious result, suggested by the various considerations which we have examined above. It is quite certain that the rapidity with which a negative gains in intensity is much more dependent on the quantity of pyrogallol present in the developer than on the alkalinity of the solution, though this factor has some influence. At the same time, the amount of detail obtainable from a given exposure does not seem to be affected in any great degree by a variation in the concentration of the reducer, but is brought out the more rapidly that the solution is more alkaline. Taking these facts into account, the most suitable developer for an under-exposed plate would contain just enough pyrogallol to start development, a large proportion of alkali, so as to set up energetic action in the shadows, and the smallest quantity of soluble bromide that will prevent the increased alkalinity of the solution from inducing fog. With such a developer, the high lights would remain very thin for a considerable time, the detail in the shadows coming up under the influence of a solution strong in alkali. When the whole of the picture has thus been brought out, it will be wanting in density, and quite unfit for printing if left at this stage. The minute quantity of pyrogallol employed, though sufficient to start development, has not been able to promote any great accession of density. It will be noticed, however, that the scale of gradation is much nearer to what it should be, and, at all events, much more satisfactory than what could have been obtained by the use of a normal developer. At the same time, silver has been reduced in every part of the picture, and this deposited silver will enable us to start further decomposition in the unaltered bromide, and so obtain density of deposit. An alternative method has been suggested, with a view to enhancing still more the obtention of detail without undue accession of density in the high lights. Many operators advocate soaking the plate in an alkaline solution, containing the requisite soluble bromide to protect the film from fog, but no reducer. After this solution has been allowed to act for a few minutes, a small proportion of pyrogallol is added, and development starts. The action of the reducer is rendered still more gradual by this plan, while the detail in the shadows is dealt with very energetically. Whichever of these modes of procedure has been adopted, the deposit obtained, so far, will be very weak, and our next step is to promote the accession of density, without which the plate would be worthless. At the same time, the treatment selected must be such as shall not disturb what scale of gradation we have succeeded in establishing. Here, again, the facts we have had under consideration furnish us with the means of attaining our object. Pyrogallol, we have said, gives density, but this action is, at the same time, proportional, as regards rapidity, to the degree of alkalinity of the solution. A strong solution of pyrogallol, made only very slightly alkaline, will act slowly on the deposit and will cause all parts of the picture to gain density, proportionally to the amount of reduced silver they already contain. At the same time, the alkalinity of the solution will be too much reduced to allow of any change being made in the contrast which exists already between the various lights of the picture. The very alkaline developer first used should, therefore, be washed off, and a fresh solution, strong in pyrogallol, and containing very little alkali, should be applied, when, if the exposure has not been hopelessly short, a negative should be obtained possessing fair gradation and printing density.

Over-exposure.

This case, which is by far the most frequent, is much more amenable to treatment than under-exposure. I have already gone fully into the nature of an over-exposed plate, and I think I have shown what would be the result of treating such a case with a normal developer. The considerable quantity of reduction product formed in the film by over-exposure will yield, on the first action of the developer, a large quantity of metallic silver, and this, combined with the developer, will reduce the unaltered haloid before it has had time to undergo the intermediate stage of decomposition, already alluded to several times. The picture "flashes" out, and refuses to take up density. The first step to take, where over-exposure is know or suspected, is to overcome the differences of permeability in the various parts of the film, differences which appear, according to Meldola, to be of considerable moment. The rapid reduction of the unaltered haloid by an increased proportion of silver from the reduction product must also be guarded against. Development should be slow and gradual. This will prevent all the silver from the reduction product from being set free at the same time. If an increased amount of soluble bromide is put into the developer, so as to mitigate the too rapid reduction of the unaltered haloid, the effects of the prolonged exposure will be rendered much

less harmful. The plate should, in consequence, be soaked for a sufficient time in a strong and neutral solution of pyrogallol, containing an increased amount of soluble bromide. This solution will permeate both the soft and hardened parts of the film, while the soluble bromide will form, with the unaltered haloid, the more stable double salt. A strong solution of pyrogallol is recommended, because, as we have already noticed, density is proportional, in a certain measure, to the concentration of the reducer. A very small quantity of alkali is now added to the developer. The action of the alkali is rendered still more gradual by the fact that the pores of the gelatine being filled by a plain solution of pyrogallol, this must be displaced by the now alkaline solution before action can start. If the exposure has not been sufficiently prolonged to give an undue amount of reversal, there will be a gradual gain of intensity in the lights, and these will, under very slow treatment, attain relative opacity before the shadows have made too much progress. Ample time must be given, excess of alkali guarded against, when, in many cases, a good negative will be secured. Hydroquinone and eikonogen have a similar mode of action to that of pyrogallol. They appear, however, to have a lesser tendency to act on the unaltered bromide of silver. This explains why many writers have dispensed with the use of soluble bromides in conjunction with these reducers. I have refrained from making more than a mere reference to iron development. This is much less under control, and does not seem to give anything like the amount of latitude in cases of incorrect exposure. In reality, it is by far too energetic for delicate treatment. As will be seen, the methods of development suggested above are fairly well in accordance with the various hypotheses and explanations I have endeavoured to make clear to you.

Free Silver in Wet Collodion Development.

Though the use of wet collodion is now restricted to a small number of applications, the mode of action of the developer is such, that I think it right to say a few words about it, if it were only to show the variety of ways in which the accretion of the silver forming the image can take place. The sensitised collodion plate is exposed while still wet. The solution of silver nitrate retained in the pores of the film is, in this case, the bromine absorbent, or sensitiser. If a wet plate be *thoroughly* washed after sensitising, and then exposed, it will prove to be reduced in sensitiveness. The presence of free nitrate of silver is therefore indispensable. After exposure, the plate is developed by ferrous sulphate, to which a quantum of acetic acid has been added. Here, again, the free silver nitrate plays an important part, as the silver with which the image is fed is derived from it, and not from the haloid in the film, as in the gelatine process. That this is a fact can be shown by washing away the free nitrate of silver after exposure. If iron development is then attempted, no image, or, leastwise, a very faint one, will be developed. The addition of a few drops of silver nitrate to the developer will, however, start development. The acetic acid has the same function as the soluble bromide in dry-plate practice, and moderates the action of the ferrous sulphate, which, if used alone, would at once fog the plate. In comparing the gelatino-bromide with the wet-collodion process, it may be said that the first action of the developer is identical in both. During exposure a certain quantity of reduction product has been formed by the action of the light on either film, and this is reduced to the metallic state at the very outset of development. It is the after-process of growth of the metallic deposit which differentiates the two methods. In the gelatine process, as we have seen, the silver is supplied by the unaltered haloid in the film. In the collodion process it is obtained from the free nitrate of silver on the plate. It may be said that, in the gelatine plate, the image is fed from beneath, whereas, in the collodion film, it is fed from above. I often hear it said that silver is precipitated on the image during development. This expression is entirely wrong, and gives no idea of the action which takes place. The mode in which the silver appears to be fixed is similar to that observed in the electroplating of metals. The metal is not precipitated in galvanoplastic operations, it is fixed by the cathode by a kind of molecular deposition. There is a very great difference between the two modes of action.

Platinotype Development.

The remarks I have made would probably not be deemed complete f I did not allude to printing processes by development. The gelatino-bromide paper for positives calls for no special remark. The action of the developer is similar to that described for negative work. In the platinotype hot-bath process, the prints have to undergo development, but the process is of a quite different nature to those we have examined so far. The object of the developing solution is mainly to bring the ferrous oxalate, formed during exposure, into solution. It can then act on the potassium chloroplatinite. The ariations in the temperature of the bath simply modify the energy f the reaction between the two salts. In contrast to what takes place in the development of a negative, this is really a case of precipitation of metallic platinum from the chloroplatinite of potassium.

In closing these remarks, it may be asked what benefit we should derive if the true nature of the transformation, which silver haloids undergo during exposure to light, were known. It is not probable that we should learn thereby to use our actual developers with more effect. Long practice and experience have taught photographers how to meet most cases in the development of their negatives. What we must hope for in the disclosure of a reliable theory of photo-chemical action is the means of discovering and applying new agents to the work of development, agents which shall be free from the discrepancies which we have found in our old and, so far, trusted developers. We may then be able to discuss the "theory" of development; what we are doing to-night is simply to compare one with another—the various aspects of the question. We cannot have the pretension of being in possession of anything more than a few experimental facts, and some more or less plausible speculations as to their nature.

Adolphe M. Levy.

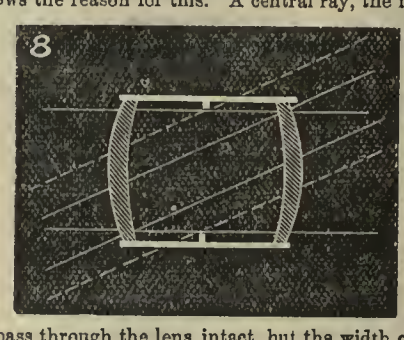
ELEMENTARY NOTES ON PHOTOGRAPHIC LENSES.*

The Rapid Rectilinear Lens.

For moderately rapid, architectural, and copying work, the standard type of lens is the rapid rectilinear, or rapid symmetrical, as it is sometimes called. This consists of a concavo-convex cemented combination, mounted at each end of a tube, the convex side being towards the end of the tube in each case; and, from the previous illustration of the curvilinear distortion of a single lens, it will be apparent that, on account of the stop being placed behind one and in front of the other, the tendency of one to distort inwards is neutralised by the outward tendency of the other, and mathematically correct projection is obtained. The two combinations being turned in opposite directions relative to the sensitive plate, the spherical aberration of one is corrected by that of the other, and brilliant definition can be obtained with the full diameter of the lens, this rendering it very rapid.

Where great variety of work is done, it is the most useful of all lenses, sufficiently rapid for portraits in a well-lighted studio, and, for all ordinary instantaneous work; it is very useful for general outdoor purposes, and absolutely necessary for architectural, mechanical, and copying where perfect accuracy of projection is essential.

For landscapes it is not quite so good as a single lens, by reason of its increased number of reflecting surfaces, four; and two of these are concave towards the plate, while in the single there are only two surfaces, and neither of these concave in the same direction. But opticians have been more successful in curing the rapid rectilinear of the defect of producing "ghosts" than the portrait, as they very rarely appear, though they probably exist in a diffused form, and prevent the image from being so crisp and brilliant as it would otherwise be. A second, though perhaps slight, objection is, that the face of the front lens is exposed to such a glare of diffused light, independent of that forming the image, though a sky-shade would be an efficient protection against this. A third objection is inequality of the amount of light reaching different parts of the plate when the larger stops are used, the beams of light forming the margins of the picture being much smaller in area than those in the centre. Diagram 8 shows the reason for this. A central ray, the full diameter of



the stop, can pass through the lens intact, but the width of the marginal ray is determined by the extent to which it is cut by the lens mount, or the portion that the lens itself is capable of transmitting. The full diameter of the stop is shown by the dotted lines. In negatives exposed under those circumstances where full advantage has to be taken of the rapidity of the lens, this inequality of illumination is a serious objection,

* Continued from page 138.

as the centre of the plate frequently develops denser than the edges, and this detracts strongly from the value of the gain in rapidity.

Wide-angle Lenses.

On the subject of wide-angle lenses, the greatest misconceptions exist in the minds of those who have given the subject of lenses little or no consideration. The width of angle included depends on the ratio of focus of lens to size of plate, and is in no way influenced by the form or construction of the lens. A wide-angle and a narrow-angle lens of eight inches focus each would produce absolutely identical images on a half-plate, the difference between the two lenses being the capability of one of including a wide angle or covering a much large plate, while the covering power of the other is more limited. If a rapid and a wide-angle rectilinear of six inches focus each were attached to a 12×10 camera in turn, it would be seen that the "rapid" would only illuminate a circle of six or seven inches diameter, and all the remainder of the focussing screen would be dark; while by substituting the wide-angle lens the illuminating circle would probably be increased to thirteen inches, or double the diameter of the other, but all within the six-inch circle, the actual sizes of all the objects and relative positions being exactly the same in each case.

A lens may be said to include a wide angle when its focus is not greater than the longer side of the plate. It may be described as a wide-angle lens when it is capable of covering a plate whose larger side is equal to or greater than its own focus.

There is no type of lens that has been so injudiciously used as the wide-angle, and a beginner should be very cautious in availing himself of its advantages. As a general rule, it is advisable not to use a lens of shorter focus than one-and-a-quarter to one-and-a-half times the longer side of the plate—frequently a longer focus is a decided advantage under very special circumstances a shorter focus must be used. Experience is the best guide if general principles are appreciated.

Including a wide angle generally produces the effect of very exaggerated perspective, though this appears somewhat inconsistent with the previous statement, that the size of the objects is directly proportionate to the focus of the lens; the reason is that, having decided on a given amount of subject, a wide-angle and a narrow-angle lens would not be used from the same standpoint to include the view. An example will assist in explaining this: A photographer is arranging a view in which he wishes a cottage to form the principal near object, and some distant hills appear just about the same height of the cottage, which is, say, four inches. Now, if a lens of half the focus is substituted, the hills would still be just level with the cottage roof, but both would be reduced to half their former size, *i.e.*, about two inches high, and the cottage would lose its importance, and the foreground would be occupied by objects that the other lens would not include. In order to get the cottage the same size as before, the camera is moved much nearer to it; but this change of position is not sufficient to make any appreciable alteration in the height of the distant hills, which remain about two inches, only half the height of the cottage, and, in consequence, they appear dwarfed and insignificant, and, by contrast, the cottage conveys the impression of being an enormous size, this effect being quite different from the rendering of a similar cottage and smaller hills by a long-focus lens, as in the wide-angle view the extreme convergence of the perspective lines is a potent factor in producing the strained effect equally as the relatively large size of near objects contrasted with the diminutive appearance of the distance. The wide-angle rectilinear is similar in construction to the rapid, the combinations being mounted very close together, and specially designed to transmit oblique rays well. Their principal use is for engineering and architectural subjects, both interior and exterior, where a large amount of subject has to be included from a very near point of view. Their limit of covering power is generally a plate whose longer side is one and a half times their own focus, or about double that of a rapid rectilinear, though it is never advisable to work them to this limit if it can be avoided, on account of the undue prominence given to near objects, and comparatively small size of the more distant. In equality of illumination they are better than the rapid type, but this is principally due to the fact that they are used with smaller stops.

The wide-angle single is intended for those landscapes where the position is too confined to obtain the desired amount of subject with an ordinary single lens, to which they are almost identical. Their focus is generally about the same as the size of the plate they are intended to cover.

The *universal* lens, or *curvscope*, is a rapid rectilinear of very large diameter, and, the construction allowing full advantage to be taken of this increased size or light-transmitting power, it is considerably more rapid.

Henry W. Bennett.

(To be continued.)

EASTMAN PHOTOGRAPHIC MATERIALS COMPANY, LIMITED.

The shareholders in the Eastman Photographic Materials Company, Limited, have every reason to be satisfied with the progress which the business is making under the able direction of the board of management. The Kodak camera is now a household word, and "to kodak" will shortly take its place in Nuttall as a convenient verb to signify photographing instantaneously. The difficulties which the Company have had to contend with have now passed away, and apart from the very satisfactory piece of information that during the past year there has been an increase of 7000*l.* in the turn-over, there is also the prospect that in the future the new buildings and plant just erected will be able to produce the Eastman Film to the extent of about 1000*l.* per week. There will therefore be no difficulty in supplying the demands of the public, and the inability to turn out orders quickly enough will be a thing of the past. Under all the circumstances, the dividend of ten per cent. on the Preference shares, and seven per cent. on the Ordinary shares, must be considered as highly satisfactory, as it warrants the assumption that, when the photographic season arrives, the business will produce much larger profits than heretofore.

Colonel J. T. Griffin occupied the chair at the annual meeting, held on Monday at Winchester House. In moving the adoption of the report and accounts, he said: I am happy to congratulate the shareholders on the gradually increasing business of the Company. It has not been in all respects so rapid as we could have desired, but you must remember the difficulties with which we have had to contend. Our business has been in all respects successful and prosperous; but from circumstances wholly beyond our control we were unable for months to supply the demand of our customers. Our friends in America were engaged as well as ourselves in the erection of new and larger works, and they were unable to supply us with goods from that side of the water. We, using all diligence, were unable to complete our works, so that we could manufacture film and other material, until the month of August. These difficulties are now overcome, and we have in hand a large stock, not only of film but of Kodaks, we believe, sufficient to meet any demand which may arise. We have now the capacity to produce film to the value of 1000*l.* per week in anticipation of the trade which we hope to have. In addition we have nearly 10,000*l.* worth in stock. But, while our progress has been somewhat less than was anticipated, we are able to show an increase of 7000*l.* in the business done during the year, and we look forward most confidently to a large increase of this business and a corresponding increase of profits. There is one point to which I ought to call your attention. You will note from the balance-sheet that we have not written off anything for what are termed patents and goodwill. This course has been adopted after due consideration and consultation, not only with our solicitors, but with our auditors and others. We think that the time has not arrived when it is necessary to write anything off the sum which stands in the balance-sheet for patents. It will be remembered, when the Company was formed the original Eastman Company had been doing business for some time in England. The English Company took over the business as a going concern, together with the stock and patents. No specific sum has ever been mentioned as representing the value of the patents. But we assume that the patents are good and valid ones, and that their value for the time being is increasing, and that for a year or two it will not be necessary to write off anything on their account unless our profits are so large as to warrant us doing so. We have had to contend against infringements of our patents, and to defend what others have termed infringements, and we have been successful in every case. This gives us some encouragement, and it is gratifying to know it. During the year a branch has been opened in Paris in one of the most spacious streets, and already this has become a source of profit, although it was not opened until August, and we have every reason to believe the business there will be as productive as it is at home. We have also opened an establishment at Nice. I trust that in another year we shall be able to show you a much larger profit and increase of business.

Mr. Gifford, in seconding the motion for the adoption of the report, thought that the business had gone on even better than they might have expected. The Company had been doing better work, and although possibly the dividend was not so large as the directors might wish, it must be remembered that the opening of the Paris and Nice branches absorbed a certain amount of money inseparable from establishing new agencies, and was equivalent to putting some of the profit into capital.

Mr. Barbrook: Do you think the patents are as valuable now as they were? I find that in England you have taken out sixteen patents, four of which were taken out in 1884 and four in 1885, the last two being taken out in 1890. As a patent only lasts fourteen years, I do not see how some of them can be as valuable as they were, and I think something ought to be written off.

The Chairman: Since the report has been prepared, new patents, not only for England, but abroad, have been taken out, which we deem of even greater value than those which we already possess; therefore it will be seen that the directors are endeavouring to protect the Company in every possible way.

The motion was then carried.

A resolution, moved by Mr. Verden, recommending a dividend of ten per cent. on the Preference shares, was then carried; and a similar one, moved by Mr. A. Pringle, seconded by Mr. G. Davison, declaring a dividend of seven per cent. on the Ordinary shares, was also adopted.

Mr. Jay then moved the re-election of Mr. George Davison and Mr. Strong, the retiring directors. He was sure the shareholders would adopt the resolution with great pleasure, for the Company had been so well managed from the first that he would be very sorry to see any change in the directorate.

Mr. J. Spiller seconded. From the long personal knowledge he had had of Mr. Davison in connexion with photographic matters he knew how thoroughly his heart was in the work. He felt quite sure that Mr. Davison would do his utmost to bring the Eastman Company to a successful conclusion. Mr. Strong, he believed was the American representative on the board, and he (Mr. Spiller) ventured to congratulate the Company upon having so powerful a connecting link between the English and American companies.

The motion was carried, and Mr. Walker (Managing Director) moved, and Mr. Gifford seconded, the re-election of the Auditors, which also was adopted.

A shareholder inquired whether there was any probability of the interest being paid half-yearly.

The Chairman: In view of the large extensions in the way of building which the Company had undertaken, it was found necessary to retain funds in hand, but the matter will be taken into consideration in future by the board, and, if possible, acceded to.

A vote of thanks to the Chairman terminated the proceedings.

—*Financial World.*

CAMERA CLUB CONFERENCE.

The 1892 Conference will be held in the theatre of the Society of Arts on Tuesday and Wednesday, March 22 and 23, under the presidency of Captain W. de W. Abney, C.B., D.C.L., R.E., F.R.S.

The following programme has been arranged:—Tuesday, March 22, Conference at the Society of Arts, 18, John-street, Adelphi, to be opened by the President at 3 p.m. Papers to be read from 3 p.m. to 6 p.m. in the theatre:—

Opening by the President.

Mr. C. H. Bothamley, *Some Points in Connexion with Development.*

Mr. Leon Warnerke, *On Chemigraphic Etching.*

Mr. A. Pringle, *Photography applied to Medical Research.*

Mr. W. Willis, *Recent Improvements in Platinotype.*

Renewal of Conference at 8 p.m.

Symposium on Artificial Lighting in Photography.

Mr. Van der Weyde, *Demonstration of Use of Electric Light for Portrait Effects.*

Mr. E. J. Humphrey, *Oxymagnesium Lamps for Printing and Lighting.*

Mr. H. E. Armstrong, F.R.S., *Theory of Development.*

Wednesday, March 23, 3 p.m., Renewal of Conference in the theatre Society of Arts. Papers to be read from 3 p.m. to 6 p.m.:—

Mr. Henry Blackburn (editor of *Academy Notes*), *The Debt of Art to Photography.*

Mr. H. Stannus, F.R.I.B.A., *The Uses of Photography to the Decorative Artist.*

Mr. H. P. Robinson, *Paradoxes of Art, Science, and Photography.*

Captain Abney, *Some Uses of Celluloid Films.*

At 7.30 p.m. the annual Club dinner for members and friends will take place at the Monico Restaurant.

On Thursday, March 24, at 8 p.m., there will be an exhibition of lantern slides in the theatre.

All photographers are invited to take part in the Conference.

Our Editorial Table.

Kallitype, No. 2.

From the Birmingham Photographic Company we have received some specimens of kallitype printing No. 2, which illustrate in a favourable degree the varied capabilities of this beautiful process. The albumen like gloss on some of the pictures certainly conduces to the provision of the finer details, while the matt surface on others is as near an approach to the characteristic beauty of platinum as could be obtained. We welcome kallitype as a distinct and agreeable advance in silver printing.

To the professional photographer, the trade price list of Messrs. J. Martin & Co., of New Southgate, should be of direct interest. The "business memoranda" it gives are quite an education in the economics of enlarging, and the list also contains prices of the various kinds of work which Messrs. Martin undertake for the trade. We note with pleasure that Messrs. Martin & Co. have a ceramic department. Accompanying the list is a photograph of some ice crystals deposited in a porcelain dish last Christmas, exhibiting a wonderfully beautiful floral design. The picture has been seen by Professors Huxley and Tyndall, Mr. Ruskin, Mr. Glaisher, and Mr. Symons, who all express admiration of it.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 3434.—"Improvements in Photographic Cameras." A. W. Harrison.—*Dated February* 22, 1892.

No. 3451.—"Improvements in and relating to Photographic Shutters." H. A. Trunderry.—*Dated February* 22, 1892.

No. 3486.—"Improvements in Magic-lantern Slides." H. Erskine and C. Taylor.—*Dated February* 23, 1892.

No. 3494.—"An Improved Apparatus for Washing Photographic Prints and Negatives." J. W. Hunter.—*Dated February* 23, 1892.

No. 3500.—"A New or Improved Method of Producing Coloured Photographs." E. Ireland.—*Dated February* 23, 1892.

No. 3598.—"Improvements in Photographic Dark Slides." W. Middlemiss.—*Dated February* 24, 1892.

No. 3637.—"Improvements in Photographic Shutters." F. Shew and E. Galopin.—*Dated February* 24, 1892.

No. 3680.—"Improvements in Apparatus for Changing and Focussing and Exposing Photographic Plates or Films." T. E. Heath.—*Dated February* 25, 1892.

No. 3791.—"Improvements in the Manufacture of Colours specially applicable for Colouring Photographs." Communicated by W. Bruns. Complete specification. A. J. Boult.—*Dated February* 26, 1892.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
March 7	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 7	Halifax Camera Club	
,, 7	Peterborough	Museum, Minster Precincts.
,, 7	South London	Hanover Hall, Hanover-park, S.E.
,, 7	Stereoscopic Club	Brooklands Hotel, Brooklands.
,, 8	Derby	Smith's Restaurant, Victoria-street
,, 8	Great Britain	50, Great Russell-st., Bloomsbury.
,, 8	Manchester Amateur	Lecture Hall, Athenæum.
,, 8	Newcastle-on-Tyne & N. Counties	Mosley-st. Café, Newcastle-on-Tyne.
,, 8	Paisley	Committee Rm., Free Lib. & Museum
,, 8	Stockton	Masonic Court, High-street.
,, 9	Ipswich	Art Gallery, Ipswich.
,, 9	Leicester and Leicestershire	Mayor's Parlour, Old Town Hall.
,, 9	Munster	School of Art, Nelson-place, Cork.
,, 9	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 9	Putney	High-street, Putney.
,, 9	Reading	
,, 9	Stockport	Mechanics' Institute, Stockport.
,, 10	Birkenhead Photo. Association	Association Rooms, Price-street.
,, 10	Birmingham	Lecture Room, Midland Institute.
,, 10	Bradford Photo. Society	50, Godwin-street, Bradford.
,, 10	Camera Club	Charing-cross-road, W.C.
,, 10	Cheltenham	
,, 10	Hackney	Morley Hall, Triangle, Hackney.
,, 10	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 10	Manchester Photo. Society	36, George-street, Manchester.
,, 10	North Kent	Gravesend.
,, 10	Oldham	The Lyceum, Union-street, Oldham.
,, 11	Cardiff	
,, 11	Holborn	
,, 11	Maidstone	"The Palace," Maidstone.
,, 11	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 11	Richmond	Greyhound Hotel, Richmond.
,, 11	West London	Chiswick School of Art, Chiswick.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

February 25,—Mr. W. H. Harrison in the chair.

Messrs. W. T. Coventon and J. Lillie Mitchell were unanimously elected members of the Association.

Mr. P. Everitt read the report of the Association's delegate on the Photographic Society's Affiliation Committee, and some discussion ensued as to the uncertainty of the financial position of that Committee.

A question premised that, by putting the lenses of a half-plate doublet of six inches focus close together, the objective became a whole-plate wide angle, and it was required to know whether the lens would then cover as well with the same stop?

Mr. W. E. Debenham said that in no case would a lens with the same stop cover equally for illumination or definition a whole plate and a half plate.

Mr. Everitt asked whether a more equal illumination could be obtained by a doublet with a short tube than with a long tube?

Mr. Debenham replied that the better illumination would be obtained with a short tube, because with a long tube, by putting the eye to where the plate would be, and looking through the stop, the whole of the surface of the stop is

not seen through, and the illumination with the longer tube must therefore be unequal.

Another querist desired to know if, in photographing an object with perpendicular lines, the camera was tilted to an angle of twenty degrees, at what angle must the camera be put to correct the distortion?

Mr. TEAPE mentioned that Mr. Chapman Jones had said, to obtain perpendicularity in such a case, the negative would have to be placed at an angle of thirty-one degrees.

After some slight discussion, the subject dropped on the understanding that it was to be dealt with in a paper by Mr. W. E. Debenham at a future date.

Mr. A. HADDON said that it would be within the recollection of members, that a strip of discoloured paper, from the margin of an Alpha print in the 1887 ALMANAC had, at a former meeting, been handed to him to test. He had submitted it to some experienced chemists, and had asked them to tell him what it contained. They had tested it, first by means of dilute hydrochloric acid and ferrocyanide of potassium, which produced a most distinct blue stain on both sides of the paper. All papers contained a certain amount of iron, and it was difficult to say whether that strip of paper contained more iron than was in it originally or not. But iron was in the strip when tested, and the colour in the paper was discharged by hydrochloric acid. If the stain were due to sulphide of silver it would not easily have been discharged by hydrochloric acid. Part of the strip was then tested for the presence of silver by boiling it in strong nitric acid. The addition of dilute hydrochloric acid to that solution produced a feeble cloudiness which was chloride of silver. His conclusion was that the print did not receive as much washing as it should have had, both iron and silver being left in. Either silver hyposulphite or a certain amount of the sensitive salt undissolved by the hypo must have been left in the paper.

After a short further discussion the meeting concluded.

Camera Club.—February 25.—Mr. J. B. B. Wellington exhibited his series of slides illustrating a *Tour in Norway*. Captain Abney occupied the chair.—After Mr. Wellington's lecture a miscellaneous set of fine lantern pictures by the same gentleman followed, and other slides were shown by Messrs. Urquhart, Hansard, Barton, and Scott. On March 10 a paper entitled *The Photographic Expression of Thought* will be read by Mr. A. Horsley Hinton.

Hackney Photographic Society.—February 25, Mr. Augustus W. Wilson in the chair.—The SECRETARY announced that several new books had been added to the library. A member asked for a good developer. Mr. HUTSON gave the following:—A. Hot water, 2 ounces; sulphite of soda, 4 ounces; sulphite of soda, 480 grains; ammol, 240 grains; water, to 20 ounces. B. Hot water, 20 ounces; carbonate of potash, 2 ounces; carbonate of soda, 2 ounces; water, to 20 ounces. For instantaneous work, 1 ounce A, 1 ounce B, and 3 ounces water. Landscape work, 1 ounce A, 2 ounces B, 4 ounces water. A question was asked whether the surveyor of a district would have any voice in the erection of a studio. Mr. CAPEL said he would not if 9 feet from highway and 15 feet from adjoining property. He said that if four small wheels were put on the question, it would obviate any difficulty in the matter. The CHAIRMAN then introduced Mr. A. L. Henderson, and prefaced the introduction by passing a high encomium on Mr. Henderson for his work in years past. Mr. HENDERSON gave an excellent lantern lecture on the Riviera, illustrating the subject with some capital slides, many being of a panoramic nature. Some two hundred slides were put through by the Hon. Secretary in response to Mr. Henderson's "Pass on, please."

West London Photographic Society.—February 26, the President in the chair, Lantern Evening.—Slides shown by Messrs. Lewis, Kellow, Hilton, Lewis, Hodges, H. [illegible], Secretary, [illegible], Hilliard, Whitear, and J. D. Rowland. Mr. England exhibited slide by slide, celluloid and glass slides, to show the difficulty of distinguishing one from the other, and explained that the celluloid slides were mounted in Mr. Scanlan's metal film-holder.

Putney Photographic Society.—February 27, Rev. L. Macdonald in the chair.—A short paper on *Exposure* was read by Dr. J. F. FARRAR, who confined his remarks mainly to the principles of light, its effect upon the dry plate, and the remarkable investigations of Messrs. Hurter & Driffield, illustrating the conclusions of these gentlemen by numerous carefully prepared tables. The Decoudun & Wathin exposure meters, and Messrs. Hurter & Driffield's actinograph, kindly supplied by Messrs. Marion, were exhibited and explained. The spectrum was thrown upon the screen by means of a bisulphide of carbon prism and attachments, lent by Messrs. Taylor, Taylor, & Hobson, to whose courtesy the Society is again indebted. There was a capital attendance, the presence of an unusual number of ladies being noteworthy. Mr. Rodney Few was elected a member.

Richmond Camera Club.—February 26, Mr. Cembrano in the chair.—The delegates (Messrs. Cembrano and Ramsay) appointed in connexion with the Photographic Society of Great Britain Affiliation Scheme reported what had occurred at the meeting on the 15th ult. Sample packets of their new rapid bromide paper having been forwarded by the Eastman Company, and distributed amongst the members at a previous meeting, Mr. Davis showed some results he had obtained with it, comprising a contact print (three seconds' exposure at twelve inches from gas flame) and an enlargement of a minute portion of the same negative to half-plate size, about nine and a half diameters. An alteration in the programme was made by the substitution for the subject announced (*Finishing in Monochrome*) of a demonstration by Messrs. Hill of their invention, "Cremo Fylma." The properties and capabilities of the sensitive solution were very clearly explained by Mr. Hill, jun., and his brother then proceeded to carry out a series of experiments, while specimens of the work, showing films positive and negative, enlarged and transferred to paper, opal, glass, &c., were handed round. The experiments were completely successful and the process was much admired for its simplicity and the apparent certainty in the results.

Croydon Microscopical and Natural History Club (Photographic Section).—February 26, Lantern Night, Mr. Edward Lovett (President) in the chair.—The Incandescent Gas Light Company demonstrated the use of their light as adapted to the optical lantern. One hundred and fifty slides, the work of members, was passed through the lantern during the evening.

West Kent Amateur Photographic Society.—February 24, Mr. John Taylor in the chair.—Mr. CLARK gave a demonstration with his Optimus enlarging apparatus, using a nine-inch condenser and a three-wick lamp, making several successful enlargements from half-plate to 12×10.

Bath Photographic Society.—February 24, third annual general meeting, Mr. Austin J. King in the chair.—Mr. P. BRAHAM said he understood Mr. Pumphrey did not seek re-election as President. He was sure they all valued Mr. Pumphrey's services highly. He now had the honour to propose Mr. Austin J. King as the future President. They had ample testimony of his fitness, of his ability as a photographer, and his congeniality. The motion was carried by acclamation. The PRESIDENT said he took the chair with reluctance, feeling that it was impossible to fill it as satisfactorily to the Society as it had been by his good and esteemed friend, Mr. Pumphrey. It was often a question in photographic circles whether a President should be an amateur or a professional. In Mr. Pumphrey they were able to combine the two. He had long been a professional, but of recent years he was an amateur—indeed an enthusiast. Following such a President, it was very difficult for any one to fill the office satisfactorily; he therefore moved: "That the hearty thanks of the Association be accorded to Mr. Pumphrey for the great energy and ability which he has displayed during his period of office as President, his many services to the Association, and acts of kindness to its members, and for the zeal which he has manifested in the progress of the art and science of photography." This motion was seconded by Mr. E. J. APPLEBY and carried by acclamation. The HON. SECRETARY then read the report and balance-sheet, which were adopted. Mr. P. Braham was elected to fill the office of Vice-President for the year. The following gentlemen were elected the Committee: Messrs. E. J. Appleby, A. F. Perren, G. F. Powell, W. Pumphrey (permanent member), Rev. E. A. Purvis, Canon Williams, and D. Williams; and Mr. W. Middleton Ashman, Hon. Secretary and Treasurer. Dr. PRESTON KING read a short paper on the subject of *Rudge's Biophantascope*. The biophantascope is an adjunct to the ordinary magic lantern, by means of which the animal depicted on the screen can be made to move with life-like accuracy. In the machine shown there are a number of photographs on glass of a man's face, taken under different conditions. In one the face is at rest, in another it is smiling, in a third frowning; in others the tongue protruding, or the eyes alone that move, so throughout the whole series. It is by throwing the light of the lantern alternately through first one and then another of these various photographs, making each image fall upon the same portion of the screen as the preceding one, and without any intermediate loss of light, that the life-like movement of the portrait is obtained. The speaker then dealt with the mechanical details of construction, after which the utility of the instrument was practically demonstrated by Mr. Rudge, who invented it. In the discussion which followed Mr. BRAHAM pointed out that an instrument constructed to register as perfectly as this one was a very difficult mechanical achievement, the smallest deviation in the positions of the negatives would be painfully apparent when enlarged. He thought Mr. Rudge had made a distinct step in advance by photographing the subject with the same arrangement used for projection.

Brighton Photographic Society.—February 23, Special Meeting, Mr Slingsby Roberts in the chair.—Mr. CAVEAT proposed that the members be asked to contribute towards a fund to pay off the financial deficiency. The resolution was agreed to unanimously. Mr. FOXALL then moved, "That this Society, known as the Brighton Photographic Society, be dissolved, such dissolution to take effect immediately upon the settlement of the liabilities of the Society." He did so principally to test whether there was sufficient life and animation in the Society to warrant them in carrying it on. He was at a loss to account for the unsatisfactory state of the Society, but there it was, and it had to be dealt with. If those present decided, under the circumstances, to continue the Society, he would do what he could to make it a success, but if, as he feared, there was not sufficient vitality in the Society, the best thing they could do would be to dissolve it. The CHAIRMAN proposed as an amendment that the words, "to have effect immediately upon the settlement of the liabilities of the Society," be omitted from the resolution. He thought they must have finality in the matter. It seemed to him that, if they postponed the dissolution of the Society to an unknown time, they would do no more good that night than they did at their recent annual meeting. He had felt a great deal of interest in the Society, and had done what he could to promote it, but there was no doubt about it, they were living, as it were, from hand to mouth. The deficiency would probably be as large, if not larger, a year hence. The meetings were not attended as they deserved. In the event of the dissolution taking place, though they would cease to meet as a Society, there was no reason why they should not meet in another form—namely, under the wing of the Natural History Society. He had been in communication with the Secretary, and had received a letter from him to the effect that the Council of the Natural History Society intended to institute a photographic section, and cordially invited members of their own Society to join it. The Natural History Society was an established institution in the town, and it struck him that, as a photographic section of it, they would take a far better stand than as a Society trying to run alone. Mr. HARRICANTLE seconded, but the amendment was lost, and Mr. Foxall's motion was then agreed to. At the adjourned annual meeting, which immediately followed, a Sub-committee was appointed to wind up the Society in accordance with the terms of Mr. Foxall's resolution.

Liverpool Amateur Photographic Association.—February 25, the President (Mr. William Tomkinson) in the chair.—Ten new members were elected. The PRESIDENT made a statement with reference to the new club rooms, and asked for suggestions regarding excursions during the coming season. Mr. FRED CLIBBORN then gave his new lecture, entitled *Two in Touraine*, illustrated by slides made by Mr. G. E. Thompson from photographs taken by him during a recent tour of the two gentlemen in France. The lecture was delivered in Mr. Clibborn's well-known racy style, which, whilst conveying valuable and interesting information, keeps the audience constantly amused by his exhaust-

less fund of dry humour. The photographs, which embraced views of the principal châteaus and churches of France, were all of that high order and pleasing variety of tone for which Mr. Thompson is noted.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—February 25, the President (Mr. A. S. Stevenson, J.P.) in the chair.—Special Meeting to discuss and note upon the scheme proposed by the New Premises Sub-committee.—The scheme, which since last meeting has undergone some modifications, was recommended by the Council, and, on the motion of the Chairman, was carried enthusiastically. Mr. C. E. Borkas, the lessee of the Art Gallery, is to provide a commodious room for weekly or fortnightly meetings, and two or more dark rooms, with all conveniences, and to allow the Association the use of the Lecture Theatre for lantern shows, &c. The necessary alterations will be completed in September, when the Association will then enter into possession, and on January 1, 1893, the annual subscription will be raised to ten shillings and sixpence, and the entrance fee abolished.

Rotherham Photographic Society.—The third Annual Exhibition of the members of this Society was held on Tuesday and Wednesday in last week. The year's work, as shown by the 360 prints on the walls, revealed considerable technical progress, while, from an art standpoint, there had been some little advance made. Very excellent results were displayed, principally on bromide and albumenised paper. The chloride paper seemed to be gaining ground, while alpha and the ferro-prussiate methods had their followers. So far, none of the members appear to have taken up platinotype printing. Landscapes were very largely in evidence, while architecture (interior and exterior) was not extensively represented. There were practically no portraits or enlargements, and only one floral study. The exhibitors were Dr. Baldwin (President), Mr. E. Isle Hubbard, Mr. W. H. Haywood, Mr. G. T. M. Rackstraw (Vice-Presidents), Mr. H. C. Hemmingway (Hon. Secretary), Mr. J. Leadbeater (Treasurer), Mr. W. Mason, Mr. W. H. Shephard, Mr. J. W. Whittington, Mr. J. Caseldine, Mr. T. W. Mosby, Mr. F. W. Barwick, Mr. John Clarke, and Mr. J. Sykes. Hand-camera work, which, by the way, seems to be becoming a feature of the Society's efforts, was shown by Mr. Rackstraw, Mr. Hemmingway, and Mr. Clarke. The Sheffield Photographic Society, which has always shown a warm interest in the welfare of its near neighbour, lent several exhibits. There were some choice platinotypes by Mr. Ernest Beck (prize medallist); Mr. T. G. Hibbert had on view several sea pieces and landscapes, in which some particularly fine cloud effects were noticeable; and Mr. Crowther had sent a number of picturesque examples. Mr. A. H. D. Acland, M.P. for Rotherham Division, had forwarded half-a-dozen framed photographs of small size, but of much merit. Mr. Acland was a member of the Photographic Society, Christ Church, Oxford. There was a fairly large collection of choice reproductions contributed by the Autotype Company. Other exhibitors were the Eastman Materials Company, London; the Fry Manufacturing Company, London; Messrs. Elliott & Son, Barnett; the Britannia Company, Ilford; Mr. J. Crosby, Rotherham; and Mr. J. Leadbeater, Rotherham. Miss Crossley, of Maltby, as an amateur, sent several whole-plate prints pleasingly executed. The portrait work of Mr. Crosby was much admired, as were also the fine examples from the other firms named. Mr. Leadbeater's photo-micrographs were a source of a good deal of interest. During each evening there was a musical programme. There was also a short lantern entertainment in charge of Mr. Leadbeater, the chief slides being a series lent by the Fry Manufacturing Company, from slides made from negatives of the late Mr. Rejlander.

Shropshire Camera Club.—February 24, Annual Lantern Entertainment.—The exhibition opened with slides representing portraits, prepared from photographs, of the Mayor and Mayoress, by Mr. Naunton, followed by a selection, lent by Messrs. Valentine and the Woodburytype Company, illustrating scenes in Jamaica, Switzerland, Venice, &c., continued by a series by Mr. F. P. Cembrano, consisting of very fine examples of Moorish architecture, together with charming scenes of the Alhambra, which may be considered almost unique. Exhibition of members' work concluded the proceedings.

Tyneside Camera Club.—February 23.—The slides of the *Yosemite Valley* (by the California Camera Club) were shown before a large company of members and friends. Mr. Thomas Simpson read the lecture that accompanied the slides.

Edinburgh Photographic Society.—February 24, Second Popular Meeting.—The lantern slides shown were the selected works of the members, and principally those taken during the preceding year. Prominent among these were the three medalled pictures of the recent exhibition of the members' work for the past season. Perhaps a running commentary on the artistic qualities of the pictures would have been an added advantage to the simple titles and names of the exhibitors, but that is always delicate ground to deal with before so numerous an audience. The musical arrangements and the management of the lantern by Mr. Haddow were carried through with great perfection. The only fault, if it be one, was that the time occupied was too extended. There was a collection at the door in aid of the Dr. Maddox Fund.

Leith Amateur Photographic Association.—February 22, Lantern Night, Mr. W. A. Bill presided.—The lantern was managed by Mr. Berrie, and, in addition, musical accompaniments, vocal and instrumental, with a humorous lecture by Mr. Hunter, varied the programme. Upwards of one hundred and sixty slides were shown. They comprised, among the number, several copies of engravings, a class of subject which ought not to be seen at a photographic society's meeting. The great majority were of a high class of merit. The most prolific among the exhibitors were Messrs. Ewark, with twenty-eight; F. L. Lorimer, with twenty-one; and the Hon. Secretary (Mr. A. Pitkiethly), with thirty-two. As a proof of the activity of this numerically small Society, the whole number of whose members are under fifty, this meeting, showing examples of the works of seventeen of them, may be taken as an example by others of a more pretentious nature.

LANTERN SOCIETY.—March 14, Exhibition of Slides, for members and their friends.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

PERMANENCY OF PRINTS.

To the EDITOR.

SIR,—I am glad to have narrowed the issue down within its proper channel, and to have elicited Mr. Coles' opinions. For my own part, I can only repeat what I have previously said, that the balance of evidence is distinctly in favour of the permanency of gelatino-chloride paper, and, as long as this is so, I must be excused if I decline to hold different opinions. I would also say that I have never—either in writing or speaking—made use of any opinion of the experts above mentioned without quoting their "actual words." On the principle that "one swallow does not make a summer," I do not see the use of the test that Mr. Coles proposes. I will leave the matter in the hands of the future.—I am, yours, &c.,

JOHN HOWSON.

The Britannia Works Company, Ilford, London, E.

CUTTING PRICES.

To the EDITOR.

SIR,—A great deal has been said and written at one time and another about *cutting prices* and the injury that low-class photographers do themselves and the profession generally by making such ridiculously low charges, and turning out wretchedly bad work, which has the effect of bringing photography into evil repute amongst many persons residing in the neighbourhood of the *cutting man*; but, for downright absurdity (not to put too fine a point upon it) I never met with a case to equal that of a man trading near here, whose so-called "complimentary coupon" I enclose, and these coupons, circulated by thousands, have a villainous caricature of some unfortunate male or female pasted in one corner, and sets forth that our worthy brother professional is prepared to supply the public at the following rates, viz.,

	s.	d.
1 cabinet or 3 cartes for	1	0
3 cabinets or 1 cabinet and 6 cartes for	2	0
12 cartes	2	6
1 cabinet and 12 cartes	3	0

Now, how in all conscience is it possible for that man to do justice to his customers and himself, to say nothing of those who are endeavouring to get a fair share of public support, giving fair work for a fair price? No, the idea of forcing trade by such tactics is a false one, and only tends to spoil some who would pay the average charge for a good photograph without a murmur—they get instead a lot of rubbish, which, having paid for they don't like to throw away, and are ashamed to give to friends.

It would, in my humble opinton, be far better for our complimentary friend to do less work in a better manner, and get more profit; he would probably satisfy his clients and get repeat orders and would soon find that such a trashy way of making up business is a delusion and a snare. I venture to think, sir, that you will strongly condemn practices calculated to lower the standing of the professional photographers, and I know your words have the weight and influence born of experience and sound judgment.—I am, yours, &c.,

OLD PYRO.

Tottenham.

[The specimens enclosed are undeserving the name of photographs. We are constantly condemning such tactics as our correspondent complains of.—ED.]

LOSS OF DENSITY IN FIXING.

To the EDITOR.

SIR,—In the last issue of THE BRITISH JOURNAL OF PHOTOGRAPHY you refer to the statement of Mr. Albert Levy anent the loss of density in the fixing bath, and deny the possibility of such a thing. But I think, from experience, you must be wrong. The plates with which I am most familiar are the Ilford, Barnet, and Paget. With the first-named, if, on taking it out of the hypo, I think it would have been better if it had been a little less dense, I generally leave it twelve or fourteen hours longer in the hypo, and this generally is sufficient. With the Barnet the same thing will occur, but in a lesser degree; but, as regards the Paget, the reduction is scarcely to be noted. But I have before now accidentally left a plate in the fixing three or four days, and, when taken out, there has been little else but the ghost of an image. I judge, therefore, that a normal solution of hypo will dissolve the silver image. Try an Ilford plate, and prove it.

That funny paragraph *re* "Lynn Camera Club" is good, but I know of a certain amateur photographic club where, if the man don't turn up who is to read a paper or give a demonstration, the Chairman suggests penny Nap, which the assembled members receive with acclamation, and the evening is devoted to the charms of the spotted pasteboards. I think the members go home after such a night quite as edified and pleased as if photography had been on the *tapis*. Will you be good enough to hand

the enclosed (postal order 10s. 6d.) toward the Maddox Fund?—I am, yours, &c., C. H. EVANS.

Gainsborough Studio, Swansea, February 29, 1892.

[Our correspondent misapprehends the point of our remarks. We simply questioned the probability of any diminution of density taking place in a normal fixing bath used for a normal time. Immersion of a negative in hypo for "twelve or fourteen hours," or "three or four days," is, to say the least of it, rather a drastic and abnormal experiment which does not disprove anything that we alleged. As for the first part of the second paragraph of our friend's letter what can we say, but *O tempora, O mores!* We have forwarded the contribution.—ED.]

FADING OF THE LATENT IMAGE.

To the EDITOR.

SIR,—Some weeks ago you had a leader about the fading of latent image in bromide prints undeveloped. I am now able to assert that such fading does take place, that it occurs within a few weeks, and, finally, that longer delay does not increase the fading. Seven years ago, wishing to have copies from a number of negatives, I got some packets of bromide paper, tested my exposure, and the following day exposed two dozen. When I came to develop, I found I had made a blunder as to distance, and that all were hopelessly over-exposed for normal development. I laid the packet aside, and forgot about them until the other day. I now found them so under-exposed, that half an hour of a normal developer was required to bring them up. The paper remains as sensitive as ever, and, when I exposed half of one of the sheets under a fresh negative, it developed in the usual time free from appreciable trace of the original picture, which came up very slowly on the other half of the undivided paper. A month ago I had occasion to take a dozen bromide prints from one negative. Having got the correct exposure, I did the whole dozen, each with two-thirds of an inch of magnesium ribbon at a measured distance of three feet. Six of the sheets I developed, and got excellent prints. The others I tried last night, developer and temperature being identical, and had a repetition of my former experience. I enclose a sheet showing the two prints of the latter experiments.—I am, yours, &c.,

February 25, 1892. BAILEY HEATH.

URANIUM-TONED BROMIDES.

To the EDITOR.

SIR,—It has often been remarked that the colour imparted to bromide by uranium is easily washed out with ordinary water, and can, from my own experience, be rapidly and entirely destroyed by adding a few drops of ammonia, or a little soda, to the washing water. Now, could a question not arise that, as the colour is fugitive under such simple treatment, a doubt as to its absolute permanence is reasonable? A mountant containing any trace of an alkali would cause irretrievable damage, and an atmosphere with traces of ammonia vapour perhaps be ruin. I think it is worth consideration.

I note that Mr. J. Weir Brown says Mr. Levy suggested that the ferricyanide of potassium combined with the silver image, and forms a ferrocyanide of silver, with which the uranium nitrate enters into combination. If this is the case, does the after-treatment with ammonia reconvert it, or what is the action?

I may remark that the ease with which ammonia will reduce the colour can be taken advantage of in treating negatives where local reduction is requisite, by very slightly intensifying the whole image, and subsequently rubbing the part with a stump or other suitable appliance, moistened with a dilute solution of ammonia. I have found this more expeditious and certain than with Farmer's reducer.—I am, yours, &c.,

Glasgow, March 1, 1892. ALEC. J. JONES.

DARK ROOM AT RIGI-SCHEIDEGG.

To the EDITOR.

SIR,—It may be perhaps of some interest for your readers to know that from June 15 next they will find at Rigi-Scheidegg a nice small laboratory for photographic work, and open to visitors.—I am, yours, &c.,

Lucerne, February 25, 1892. D. R. SCHERLER-HAUSER.

INSTITUTE OF PHOTOGRAPHY.

To the EDITOR.

SIR,—I sincerely hope that the efforts of Messrs. Bolas, Meldola, and Warnerke, together with your own powerful leader of the 12th instant, will result in the commencement of a Technological Institute, if only on a modest and unpretentious scale. Is anything more likely to command the support of all intelligent photographers than the establishment of an institute for the purposes you name, and also, I hope, without encroaching on any one else's preserves, of a central club, to which could be attracted all the men of "light and leading" in the practice of photography.

It should not be difficult to get, in a matter of so much importance, the co-operation of the local societies; and, as bearing somewhat on the subject, I would like to interpose my own personal experience. Six years ago, being at the time connected with a well-known society, I advocated, in committee, the formation of classes for the study of theoretical photography, the crude idea being to work on the syllabus of the City and Guilds of London Institute, and for the society to give to any successful student certificates signifying competency not only for theory, but, after contributions of work in open exhibitions, for practical work. I considered that such certificates could not fail to be of value to the possessor, although possibly the field of study would have been somewhat limited. The project fell through, but from one cause only, which was, however, a very important one—viz., the want of a qualified (by City and Guilds of London Institute) teacher. There was otherwise, I think I may say, no objection whatever to the scheme. I never gave up entirely the idea; but when, a few years later, I found myself (after passing the necessary examinations) in a position to offer my own services, circumstances removed me from the town. If it had not been for that removal, I should certainly have endeavoured to make a beginning. Let me say here, that if, in my present position, I can do anything in the direction indicated, I shall certainly be ready to help, but there should be concerted action.

I would suggest the formation of a "British Photographic Institute," subscription one guinea for London members, half a guinea for country members, with the usual offices; and an educational and research committee to be formed of men of such calibre as Captain Abney, and others, whose names naturally present themselves in a case of this kind, who would formulate a syllabus of study for the guidance of provincial teachers; examinations to be held yearly, exhibitions of photographs, &c., also yearly, certificates then to be awarded with reference to competency. It would be strange, indeed, if throughout the country we did not find here and there a promising recruit for the research laboratory at headquarters.

Your suggestion, *re* the "art" side, is not to be overlooked. It would not do, for instance, to place this important branch in the hands of a man who, after laying down the canons and founding, may be, a school, is liable to turn tail, and generally to play the dence with our young and budding workers. On the whole, perhaps, it would be better to follow as much as possible the old masters until such times as the "new" men have discovered a better course.

Hoping that this proposal for the establishment of an institute will not be allowed to drop,—I am, yours, &c., D. D.

February 23, 1892.

A WORD IN SEASON.

To the EDITOR.

SIR,—The long-vexed question as to the right of photographers—professional and amateur—to call themselves "artists" is one of easy solution. By the right of custom they have a trade right to the distinction. Have we not "artists in hair," and "artists in boots?" Why not, then, artists in photographs?

The French, as a nation, are the most artistic people in the world (unless it be the Japanese). In France a painter calls himself a painter, never an "artist;" he leaves that to the artisan, and holds the term in small esteem. I am a painter, photographers may call themselves artists without offending my prejudices.

Would not all reasonable ends be served by people calling themselves what they really are? To wit, doctors, lawyers, authors, painters, photographers, &c., prefixing the qualifying "amateur" when not professional.

In respect to the question whether photographs are works of art, something may be said on both sides. That a photograph may possess much artistic merit, no cultivated mind could doubt. That the best photograph that ever was, or ever could be, made could have the same art qualities which characterise the works of the world's renowned painters, no sane mind could assert.

To try to force upon the improving art perception of the present generation any fad-photographs as works of high artistic merit is vain and ridiculous. The most rampant of professors who tried this ended ignominiously in "a renunciation." On the other hand, all that is artistic, all that is good and true in a photograph, will earn instant recognition and retain admiration.

Processes and materials are something, but the man who uses them gives to his work all the art quality it possesses. With a natural artistic temperament and feeling a man may produce photographs of great artistic merit. A painter needs, and must possess, in addition to these natural endowments, an executive skill of a kind which only years of devotional study can give, and imagination, with which it yet remains for science to discover a means to give to the camera.—I am, yours, &c.,

Bloomsbury Square, W.C., February 22, 1892. BART ROUS.

Exchange Column.

Answers to Correspondents.

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

John Thomas Barker, Stourbridge.—*One photograph, Snow scene, Vine Inn and Flour Mill. Two photographs, Snow scene, Adam's Hill, Clent, Stourbridge. One photograph, Snow scene, St. Kenelm's Church, Clent, Stourbridge.*

NEGATIVE.—Copy the photograph, and from the transparency make another negative.

J. CRAWFORD.—We know nothing more of the matter than that which appeared in the paragraph to which you refer.

A. F.—The Sciopticon Company, of Colebrook-row, N., who are the makers of the camera, will give you all particulars.

O. B.—1. The silver nitrate is largely in excess. 2. The old methylated spirit is not now retailed in such small quantities as you require.

H. W.—1. The pictures are excellent. 2. The stains may probably be removed by dilute nitric acid. 3. Preferably after the picture is printed.

W. MAJOR.—1. By a separate pneumatic tube, we should think. 2. The ventilator would answer the purpose. 3. Consult our advertising columns.

WELSH PHOTOGRAPHER.—For *cartes* and cabinets you had better continue to employ your portrait lenses. No other lenses are so suitable for that kind of work.

J. PEARSON.—Mr. Ackland is not a commercial maker of collodio-bromide plates, a modification of which process is simply named after him as the author.

J. C. P.—The material is celluloid. We do not know where it may be obtained in such thin sheets; probably Mr. J. R. Gotz, of Buckingham-street, can supply you with the necessary materials.

F. A. BRUTON.—Probably Mr. Common or Mr. Isaac Roberts, have numerous photographs of nebulæ, star clusters, &c.; but it is doubtful whether you could obtain them from them. They are not on sale anywhere, to our knowledge.

S. O. L. D.—Quite enough has been said with regard to the "pastel portrait" business, not only by us, but by almost every other journal. If you had only read what has often appeared in our columns, you need not have been victimised.

P. O'GORMAN.—The process of photographic engraving or etching (intaglio plates) attributed to or said to be Klic's process, is not patented; therefore, it may be worked without hindrance. Whether the process be that worked by Klic or not, it is one capable of yielding excellent results in experienced hands.

H. B. H.—1. Between the so-called sub-carbonate and pure carbonate of soda and the common washing salt there is little, if any, practical difference in development; but the hydrate (which is the caustic compound) is far more energetic. 2. Send us a letter addressed to the gentleman named, and we will forward it.

HIBERNIAN ISRAELITE (Bournemouth) asks what are the advantages, if any, of pebble spectacles over those made of ordinary glass?—In reply: Pebble glasses, owing to their hardness, retain their brilliance longer than ordinary glasses, and, being of a higher index of refraction than the latter, the radius of the curvature may be lengthened.

STAFFS. says for many months past he has been saving the old developing solution, and now he has a paraffin cask full of it, and asks the simplest method of recovering the silver from it. As the developer from dry plates contains no silver, there is none to recover. Hence the best plan of dealing with the solution is to run it down the drain.

B. A. (Cambs.)—The *Utrecht Psalter* has been reproduced photographically. The work was executed some few years back by the Autotype Company by the collotype process. We are not sure whether the reproduction was published by them, or by one of the societies. A letter to the Company, 74, New Oxford-street, will secure you the information desired.

T. STEDWELL.—It would be quite illegal to produce miniature bank notes for large, or indeed any, amounts by photography to be used as "Christmas cards." Whether the Bank authorities would interfere with such small reproductions as "an inch long," we cannot say. Our advice is, Write to the Governor of the Bank, and explain what you wish to do.

ALPHA.—If the paper is some of the first put upon the market it must now be tolerably old, and has possibly with age become somewhat deteriorated, particularly if it has been kept under adverse conditions. We recommend you to procure a small quantity of fresh, and then try the two kinds together. This will prove whether the paper is at fault or whether it is a question of manipulation.

F. H. J. RUEL (St. John, N.B.).—1. The Eastman Company, of Rochester, N.Y., have recently issued a camera known as their No. 4 Kodak, which is adapted for dark slides. The shutter is exceedingly rapid, but the lens is not equal in rapidity to Wray's 5 × 4, which works at *f*-5½. We are not aware of any one single hand camera in this country embodying all your requirements. 2. The system is excellent for the purpose.

W. H. GILDER (Baltimore).—The panoramic camera, of which you send sketches, is quite practicable, but it is almost identical in principle with that by Johnson & Harrison, which was brought out many years ago. It is, however, imperative that the camera be rotated from a point under the optical centre of the lens. The idea is undoubtedly a meritorious one, but we fear that there is at present little prospect of its commercial success on the English market.

J. P. MILNES.—1. A single landscape lens covering the size of plate used. 2. Consult our advertising columns. There are so many excellent instantaneous shutters on the market that we cannot give preference to any one—besides, it is against our rules.

BEXLEY HEATH.—There are several ways of producing what are known as "doubles." The plan we gave you in reply to your previous query, that of taking them direct in the camera, is the most general, because it is the most simple. It can, of course, also be done by double or triple printing from different negatives, but this method is more troublesome when a number of prints are required. The picture forwarded was not retained. Why not ask your friend who made it, and said he printed it from separate negatives, to tell you how he did it?

GEO. STEVENS says he has been experimenting in photo-lithography, and he finds a difficulty in applying the ink to the stone, and fears the roller may be at fault. He adds that he bought it second-hand, and wishes to know the condition the leather should be in, as his is very hard.—The leather of the roller should be soft, like leather well indurated with fatty matter. If it be as described, it is next to useless for the work. A great deal of the success in photo-lithography depends upon the proper condition of the ink roller. Better submit it to a working lithographer before wasting more time.

W. D. says: "Please to answer the following questions, and oblige, viz.—1. If a photographer wishes to prevent others from copying a photograph that he intends selling (portrait), what has he got to do and what does it cost? 2. If a photograph has the word 'copyright' on the mount, does that prevent one from copying it, or does it only do so for a certain time? 3. I have a card that says on mount 'Copyright reserved.' What does that mean?"—1. Register the picture at Stationers' Hall. The registration fee is one shilling. 2. If the word copyright appears on the mount, it infers that the picture has been made copyright. The copyright in a picture is for the life of the author and a certain period after his death. 3. We do not know the meaning of "copyright reserved" as here applied.

GEORGE GRANT writes, *re* copyright: "I would like you to give me your opinion on the following points. Not the morality, it's the law that is wanted. 1. Supposing I issued in January a photograph; somebody copied it, and I see them selling it at half-price. If I registered it on March 1, could I stop the sale of copies copied from these photographs issued in January? 2. Or could I derive any advantage by now registering the photograph?"—1. This is somewhat an open question. If we mistake not, contrary decisions have been given on this point. Perhaps some of our legal readers will express their opinion. 2. By registering the photograph now, protection would certainly be secured against piracy of any copies issued after the date of registration. Of that there is no doubt.

H. H. H. says: "Wishing to dry some negatives, the other day, in a hurry, I did as I had often done before, placed them in a dish of methylated spirit. Immediately after they were immersed the spirit became "milky," just as it would have done had "finish" been used. Thinking I had been supplied with this, I sent the remainer back; but the seller replied that it was spirit, and that it contained no gums. The negative dried opalescent, and not transparent as usual. Can you explain the cause, or has the dealer deceived me?"—The spirit used was no doubt free from gums, but, being according to the new Excise regulations, it becomes milky in the presence of the water contained in the negative. This is one of the inconveniences to photographers of the new regulation. We suppose, however, it must be put up with for the present.

THE PHOTOGRAPHIC CLUB.—March 9, *The Oxyhydrogen Microscope*, Mr. T. E. Freshwater, and *The Incandescent Light*. 16, *Shutters*, Mr. A. S. Newman.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—On Tuesday, March 8, a paper will be read on *Photography applied to the Detection of Crime* by Dr. P. Jeserich. The paper will be illustrated by lantern slides.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—March 10, *The Wet Collodion Process*, by W. E. Debenham. 17, Monthly Lantern Night. 24, *Continental Photographic Establishments and their Influence*, by W. H. Harrison.

MR. GUSTAV MULLINS, the Court photographer in the Isle of Wight, recently took the first portrait of Prince Donald of Battenberg, the youngest child of Prince and Princess Henry of Battenberg, at Osborne. The groups of the Royal tableaux at Osborne were taken on the stage. This is believed to be the first occasion on which Royalty has been photographed by flashlight.

ON Saturday, March 12, the members of the Holborn Camera Club hold their annual exhibition and *conversazione* at Anderton's Hotel. The following are the classes for competition by the members:—Class 1. For the best display of the most numerous and meritorious prints, the best average to be the basis of the judgment. 2. For best display of six pictures by new members since last exhibition. 3. For the best display of six pictures by old members of the Club who have started photography since the last exhibition. 4. Single portraiture, any size. 5. For the best set of six lantern slides. 6. Half-plate and 5 × 4, best set of six. 7. Quarter-plate, best set of six.

CONTENTS.

THE BRITISH
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BINOCULAR EXAMINATION OF LANTERN SLIDES.

At the last meeting of the London and Provincial Association, a small piece of apparatus of the lanternoscope *genus* was exhibited, coupled with the name of Mr. George Mason, of Glasgow, as its sponsor.

Hitherto "lanternoscopes," by which we mean the pleasant and pretty little boxed-up table-stands for viewing lantern slides with a peep-hole in front containing a single magnifying glass through which to look at them, have been liable to the serious drawback implied in one eye only being available for the purpose; but in the one in question, the infinitely more comfortable and natural method of employing both eyes has been adopted. This is effected by the means we described so long ago as 1884, since which time till Mr. Mason took it up several months ago, it seems to have been lying *perdu*.

It was, as we said on the former occasion, a matter of regret that one could not examine a lantern slide under a certain degree of magnification with both eyes, as otherwise a very pleasant table instrument might result with which one could while away many an hour in looking at these attractive pictures, which would then be seen under conditions more favourable than, and with apparent dimensions quite as great as, when they are projected on a large screen for the benefit of the multitude, and when no time is afforded for studying any one or more special subjects in detail.

The remedy for the shortcomings of the single eyepiece of the lanternoscope is obviously to have two eyepieces. These must of necessity be prismatic in their nature—that is to say, the eyes must each look through the eyepiece lens under circumstances which, assuming a circular lens, shall cause decentering, or transmission to the eye through a portion of the lens at one side of its centre. This, as we have formerly shown, means really the utilisation of a prism, either with or without its surfaces being ground to a curve. In the former case a lens must also be employed; in the latter it is unnecessary.

If a *very* short focus of eyepiece be desired, it is essential that it be achromatic; but otherwise it is not necessary, as the slight bending of the rays required does not cause any appreciable colouration more than would a pair of short-focus spectacles decentered to suit vision correctly.

We have had a binocular prismatic lanternoscope made of only four-inch focus, the eyepieces being achromatic, and constructed on the principles we published six years since; but, except under very exceptional circumstances, we do not recommend the employment of such great magnifying power. By exceptional circumstances we mean placing an instrument of this nature in the hands of the public generally, on account of the possibility of its being unsuited for all kinds of vision. In Mr. Mason's new binocular, he has, at a small sacrifice of magnifying power, preferred to adapt it to the vision of the many, and therein he has acted wisely.

What is the best diaphanous material with which to form a backing for the lantern slide when viewed in this binocular diaphanoscope? Ground glass will answer, but it is far from being the best. If too close to the transparency, it causes a granular appearance that is unpleasant. Flashed opal is much to be preferred. We have, with excellent effect, employed glass coated with a thin emulsion of clarified gelatine and oxide of zinc, and pleasing effects may be readily obtained by bands of colour painted across a strip of glass at the back, by which can be imparted a blue tone to the sky, a grey to the middle distance, and a warm brown or green tint to the foreground.

In these few remarks we have employed the term lanternoscope for our own present convenience, as a descriptive word introduced by Mr. Tylar, of Birmingham, but without any desire to deprive him of its exclusive use, although as recent enactments show no protection is now given to the holder of any title or trade mark which can be shown to be of a descriptive nature—a finding with which we have no sympathy.

PHOTOGRAPHY AND THE DETECTION OF CRIME.

Dr. Jesserich, of Berlin, may congratulate himself upon having secured the enmity of several sections of the criminal classes. According to his paper, which was read at the meeting of the Photographic Society of Great Britain on Tuesday night, photo-micrography has enabled him to evolve a class of criminal evidence which a few years ago would have been deemed impossible to secure. The value of photographs of the scenes of crimes and accidents taken immediately after the occurrences has, however, long been recognised by others as well as Dr. Jesserich, but it has remained for him to apply photography to certain ends which, so far as we are aware, had not before been sought in legal procedure. His paper dealt with two sections of the subject, the first embracing photo-micrographic reproductions of substances not to be identified by other means; the second treating of the detection of documentary alterations and erasures by colour-sensitive photography.

Hairs found on the bodies of murdered persons, when photographed under microscopic magnification, have been proved to coincide exactly with the hairs of suspected persons, and in one case the hair of a dog was shown to have emanated from an animal which belonged to an accused person. This evidence was mainly instrumental in securing convictions. In like manner the hair of a victim was found to be identical with that taken from the clothing of a suspected person. Seen under microscopic magnification, the points of difference

between a man and a woman's hairs and the hairs of animals are very strongly marked.

Coming to the determination of human blood in contradistinction to the blood of mammalia, the doctor easily establishes the difference in the sizes and shapes of the corpuscules, by the same infallible means, the practical application of the proofs finding play in demonstrating that an axe, although wiped clean, had distinct traces of human blood upon it, which the accused asserted was the blood of a goat. By the same method a spot of blood on the clothes of another accused was also unerringly indentified, to the confusion of the suspected individual.

We should infer from Dr. Jeserich's complacency and exultation at the success of his evidence in bringing home guilt to accused persons—who, in many cases, obligingly confessed when confronted with these ingeniously conceived accusations—that German judges and juries dwell on a high level of scientific reason. We are not so sure that similar evidence if produced in a British Court of justice would so easily weigh down the balance one way or the other, inasmuch as that evidence is, after all, only more or less of a presumptive nature, and quite conceivably open to the admission of error.

In the discrimination of forged documents, Dr. Jeserich strikes us as having achieved results which preclude the possibility of exception. Ordinary photographs of altered writings quite fail to accentuate, or even indicate, alterations, whereas "colour-sensitive plates in a suitable light" (we quote the whole of the description of the process as given by the author, although it is obvious what is meant) not only lay bare such alterations, but also differentiate between variously coloured inks, and even distinguish the original writing from that superposed upon it. The value of photography in such cases as this, which was amply demonstrated by the slides shown on Tuesday night, seems to us to open up a gloomy prospect for so-called experts in writing.

Limited space constrains us on the present occasion to do no more than glance at the salient features of a most able paper, interesting, perhaps, rather as an account of what photography is capable of achieving in the field of strong presumptive evidence in doubtful cases, as well as in the detection of forgeries, than as an exposition of the process employed; but, with the hint thrown out by Dr. Jeserich, we have no doubt that British photo-microscopists and photographers will not long delay entering that field, for, especially in the detection of forgery, the assured penetration and fidelity of photography will be welcomed by the officers of justice and society at large.

THE EFFECTS OF MOISTURE IN CARBON TISSUE.

The reviving interest now being taken in carbon printing calls to mind an important point in connexion therewith that is often overlooked by some workers, and may still be unknown to novices. We allude to the amount of moisture present in the film. It is tolerably well understood that carbon tissue is insensitive to light when it is wet, and that, therefore, it can be sensitised in open daylight, as it only acquires sensitiveness as it becomes dry. But it does not, on the other hand, appear to be so generally known that the film is equally as insensitive when it is in a state of dryness. By dryness in this instance is meant complete desiccation. When the tissue is in this condition, it may be as safely exposed to daylight as when it is wet. Therefore it will be seen that, as the film is insensitive alike when dry and when wet, the hygroscopic condition of the bichromated gelatine is an important factor in carbon printing.

Want of knowledge of the above fact fully accounts for many of the failures met with by some who essayed carbon printing in former times, when they had to depend upon tissue of home sensitising, which was not always secured in a uniform condition as regards the moisture it contained. Hence there was frequently a considerable waste of material through errors in exposure. However, this may be considered a thing of the past, as the tissue can now be obtained commercially, either in large or small quantities, to suit consumers, ready sensitised and in the right condition for use, containing neither too much nor too little moisture.

It should, however, be kept in mind that gelatine, particularly when it contains saccharine matter, is an absorbent condition, and that, if it be exposed to a damp atmosphere, it will take up moisture, which may have a material influence upon its sensitiveness to light, especially if it be kept some little time before or after it is printed. This being the case, it is obvious also that attention should be paid to the conditions under which it is employed. For example, if the tissue be in its very best state, any alteration in its humidity, one way or the other, would be the reverse of improvement. For this reason, the paper should never be exposed unnecessarily to the atmosphere, the state of which, in this country, is continually varying. Again, if the tissue in its normal state be put into the printing frame, and backed up with damp pads, it will absorb moisture from them, and consequently become more sensitive, to say nothing of its "buckling," on account of its expansion. On the other hand, if the pads or surroundings be made abnormally dry, they will deprive the tissue of some of its humidity, and thus affect its sensitiveness.

Not only does the amount of moisture present in carbon tissue influence its sensitiveness, but it very materially affects its keeping qualities. The more humid it is, the shorter time it will retain its solubility and normal degree of sensitiveness. It is tolerably well known to most workers that, as insolubility increases, so does the tissue become more sensitive. The tissue now supplied commercially contains such an amount of moisture that, at this time of the year—for temperature is a factor in the case—it will, with proper care, keep for two or three weeks in good condition; but, if it be subjected to a humid atmosphere for a short time as soon as received, it would probably become quite unworkable at the end of a week, while before that time its sensitiveness will have become greatly enhanced.

Seeing that the presence of moisture in the paper has such a tendency to destroy its keeping qualities, it will naturally occur to some that, if it were made quite dry, it would retain its solubility for a longer period. This is the case; but, as mentioned above, a certain degree of humidity is necessary for successful working. A degree of dryness that would ensure better keeping qualities would considerably militate against sensitiveness and other essential qualities. It is a fact that carbon tissue, if it be thoroughly dried—by this is again meant completely desiccated—can be, and has been, kept good for six months and upwards. Probably it could be preserved almost indefinitely, without having its solubility destroyed. But in this condition it is quite unworkable, although it still retains its original properties if the proper amount of moisture be restored. This may be done by exposing it for a time to a damp atmosphere.

It might be suggested that carbon tissue could be supplied that would keep almost indefinitely, and have the moisture

introduced when it was required for use. So it could; but, unfortunately, practical difficulties step in the way. In the first place tissue, to possess this property, is in such a brittle condition that it cannot be bent without cracking. Then, there would be the difficulty of introducing the right proportion of moisture, and getting it evenly diffused through the entire thickness of the film. For it will be manifest, as the moisture is first absorbed on the outer surface, that that becomes moist before the inner portion is affected, and, if the exposure to damp were continued long enough for it to penetrate to the latter, the former would become too humid. This difficulty might, however, be overcome by permitting a certain amount of moisture to be taken up by the surface, and then storing the tissue sufficiently long for it to become diffused throughout. The thing has been tried, and it answered with experienced workers; but, in practice, it was found to involve more trouble, and required greater knowledge in getting the tissue in a satisfactory condition, than in sensitising it in the first instance, while the results, even in skilled hands, were less uniform. The effect of moisture in carbon printing may be recurred to on some future occasion.

PRINTING FROM DEFECTIVE NEGATIVES.

It is a very frequent occurrence to find it necessary to print from a negative that, in its natural state, is very far from giving a satisfactory result. The friendly advice, "Smash it, and take another," can rarely be followed in such cases, for the very reason that renders the task necessary—namely, that the negative, from one cause or another, cannot be replaced; and, on the same account, the risk attending any attempted dodging or patching of the precious negative itself is seldom faced.

The intensification of thin images, or the reduction of those that are too dense, are amongst the simplest and safest operations that may be required under such circumstances; yet even these are shirked, no doubt chiefly on the ground of the fatality that seems to hang around negatives that are unique. The intensification of a gelatine negative that has been made some time, and perhaps seen some use, and of whose antecedents little that is definite is known, is a different matter from taking in hand a plate that is fresh from the developer, and whose whole history is an open page. The reduction of the denser parts of an image in that way defective is even still more risky, whether the chemical or mechanical methods be adopted, for gelatine films behave very erratically sometimes under such treatment. After using the ferricyanide and hypo reducer, probably on some dozens of plates, without a single hitch, it was reserved for us to make the discovery of one of its peculiarities—its proclivity to yellow stain—on a rather valuable negative, that had done very well in its unreduced state, and which did not improve in the process. The plan of polishing with a tuft of cotton dipped in spirit is another plan that answers admirably in numerous cases, but has a most unhappy knack of breaking down when called on for a special effort.

Under the circumstances, it is not surprising that the methods which leave the original negative intact are those which find most favour. If the case is one simply of over or under-density, the plan is to be recommended in preference to that of reproducing it through the intermediary of a transparency, as it is well known that negatives that do not print satisfactorily on albumenised paper will very often give a really good result on a gelatine plate, or better still on carbon transparency tissue. This we always prefer when feasible.

Another method, and one which lends itself equally well to general or to merely local treatment is one that was first described by Mr. William Brooks some years ago, consisting in making a reproduced negative impression upon albumen paper, and attaching this to the back of the glass, so that its parts register with the negative film. Images that are generally too thin are admirably reinforced by this means, while, if portions of the negative only require modification, the remaining parts of the picture may be taken out by chemical means from the paper negative, or even cut out. The paper may be oiled in parts, and left in its original condition in others when necessary, and, finally, the surface of the paper serves admirably for retouching upon. One care should be taken—namely, that the paper negative be made to adhere to the glass by the edges only, as, if moistened and caused to adhere over the whole surface, it will expand irregularly, and the result will be a want of coincidence of the outlines.

Coating the back of the glass with coloured and semi-opaque varnishes, portions of which are scraped away when necessary, has found many supporters, and, in careful and skilful hands, is no doubt a useful method. But it undoubtedly requires this care and skill in order to ensure success. A plain matt varnish employed to form a tooth for the pencil is also useful, and is easier to work than the others.

Tissue paper and ground-glass screens fixed to the front of the printing frame, or even placed in contact with the back of the negative, are frequently of the greatest utility when local treatment is necessary; but, as already remarked, a considerable degree of care and skill are necessary in the execution of the work with brush or pencil that will be required in such cases. The trouble may, however, be greatly reduced if the plan be adopted that has been previously recommended for vignetting, of keeping the printing frame in motion during exposure, as then, owing to the slight space that exists between the negative and the mask, the effect of the pencil or brush marks is softened or vignetted, and made to harmonise more closely with the image proper. Such treatment is specially adapted, in portraiture, to negatives in which the facial gradations are too strongly marked and print heavily; if a sheet of tissue paper, or *papier minéral*, be strained over the reverse side of the negative, and the pencil applied pretty strongly over the lines or shadows that are too strongly rendered, these will be found, when printed on the rotating platform, to be wonderfully softened without, on the one hand, interfering with the definition of the negative, or, on the other, betraying the use of the pencil. Those who have tried it will know how difficult it is, without considerable experience, to tamper with the lines and shadows about the eyes of a portrait and still retain the expression, or perhaps even the likeness; but by the method given it becomes comparatively easy.

In a large majority of instances what is chiefly required is the modification of the general density of the negative without any special local treatment, and it is to such cases that our remarks are principally intended to refer. As already suggested, the reproduction of the negative by means of a dry plate or carbon tissue forms an almost invariably suitable way out of the difficulty, but it necessitates the double operation of making a transparency from which to reproduce the negative, and this is in many cases objectionable. The same remark applies to the Brooks' method, also alluded to in the earlier part of the article, which possesses the additional disadvantage of greatly increasing the time occupied in printing, owing to the want of transparency of the paper support of the auxiliary negative.

But there can be little doubt that for thin-plate negatives the system of supplementing the original image by the superposition of a second one, or, in the case of "hard" negatives, of a thin positive image, as recommended some years ago, is a thoroughly sound, if not the very best, one.

(To be concluded.)

Photographic Convention of the United Kingdom.—Although it is pretty generally known that the Convention this year takes place in Edinburgh, the time at which the meeting is fixed to be held is not so well known. We learn that the date has been fixed for the week commencing July 11. In order to be in time for the opening meeting on Monday evening, those who have to travel a considerable distance—from London, for example—will consult their convenience by leaving on the night previous, by which arrangement they will be able to arrive in Edinburgh in time for breakfast next morning.

Dallmeyer's Teleo-photo Lens.—We congratulate Mr. Dallmeyer upon having effected a genuine advance upon the original idea, which is now sufficiently familiar to our readers. We have long thought that a better back combination for a teleo-photo lens than the biconcave lens, whether single or achromatised, might be devised in order to overcome the lateral aberration consequent upon the employment of that form. By the symmetrical combination, each element of which is achromatic and concave *per se*, now adopted by Mr. Dallmeyer as a distributor, we believe that he has placed his teleo-photo lens on a substantial basis, and one by which a large field is capable of being sharply covered. The details of construction will be found on another page.

Photograph of the Moon.—In *Knowledge* for the current month there is an excellent photograph of the moon (taken about as it w entering its second quarter) from a negative taken by the Messrs. Henry. The plate was placed behind the eyepiece and the large picture then taken direct, being fifteen times larger than would have been the result if the plate had been placed in the ordinary manner in the focus of the objective.

Photography and the Behring's Sea Difficulty.—We note that photography has been used for official evidence in a novel manner. Our readers are away of the difficulties surrounding the seal-fishing in Behring's Sea question, and Sir G. Baden Powell lately paid a visit to the spot, and took a number of photographs, especially of those spots known as the Breeding Islands. The plates now developed show the presence of seals in hundreds of thousands.

Enlargement of Microscopic Objects.—Sir David Salomons recently gave a lecture on *Optical Projection*, a simile from which may be quoted. Speaking of the enlargement of microscopic objects, he brought before his audience a comparison which would bring home to the least mathematical mind among them a concrete idea of what a certain amount of enlargement, as expressed in the ordinary manner, really meant. He showed that a postage-stamp, for instance, if enlarged 4500 diameters, would cover two and a half acres!

Photographing on Wood.—At the last meeting of the London and Provincial Photographic Association, Mr. Rawlings exhibited a number of photographs on wood, which were highly admired. They were made by preparing the surface of the wood with a mixture of albumen and zinc white, rubbed in with the palm of the hand, and then coating with a film of collodion on which silver nitrate was held in suspension, the pictures being printed out under reversed negatives, and fixed, but not toned. The collodion was then dissolved off with ether and alcohol. Mr. Rawlings stated that engravers found the surface of such blocks excellent for cutting purposes. We understand that he is to read a paper on the subject at a forthcoming meeting of the Association.

Cloud Photography.—This is the title of an article in *La Nature* by M. Gaston Tissandier. It contains much instructive matter, and is illustrated by a very excellent photograph of clouds, obtained at the Pic du Midi by M. Jacques Ducorn on August 19 last. The latter, in his descriptive note, states that the only fear in exposing is that the time given may not be short enough. The ordinary method of photographing, he says, though sufficient for amateurs, leaves something to be desired for the scientific man; but, by means of isochromatic plates and a yellow colour screen (glass with parallel faces) placed within the lens, he further states that, although the screen is used, the exposure is still instantaneous, and the only fault the negatives possess is that they give the deep blue of the celestial vault as absolutely black.

Combustion of Celluloid.—The durability of celluloid and similar substances has more than once been questioned: Professor C. V. Boys has published an account of a very singular accident to a lady's dress, caused by buttons made of one of this class of compounds. She was standing in front of a fire, not blazing, but merely red; the button was entirely consumed, and others were scorched. Professor Boys has been making some "rough-and-ready tests" with one of the buttons, which, as he puts it, show that they are for all practical purposes liable to spontaneous combustion. Of course, until we knew the actual composition of these buttons, we could not justly compare them with the celluloid employed for films, but at the same time the Professor's account will cause some anxiety, and the fire insurance companies, never too eager to make things comfortable for photographers, will thus have another lever for increasing their rates, or at any rate, refusing to lower them, as it is the universal belief they ought to do.

"Truth" and the Free Portrait Swindle.—Our sixpenny contemporary, which, by the way, some years ago distinguished itself by its offensive and ignorant views on photography and photographers, has recently, *inter alia*, been having its fling at the Imperial Portrait Association, *alias* Charles Beresford, *alias* Austin & Eddy. If "Henry" had read his BRITISH JOURNAL, he would have found that his young lion had only made a second-hand discovery, that the Free Portrait trick originated in the United States, and that it was worked by one gang in this country. It seems now that "Beresford," as a new bait, professes to have bought the bankrupt stock of "Austin & Eddy," and consequently two-and-sixpenny picture-frames are now to be had at the reduced rate of—five shillings each. The other night, at the meeting of the National Association of Professional Photographers, this subject was mooted, the reply being a "non possumus." We think, however, that the Association might confer a distinct benefit on the profession and society by officially issuing a public notice warning people against Beresford, Austin & Eddy, and others of their kind.

Fading of the Latent Image.—A correspondent, in the last number of the JOURNAL, relates an experience tending to show that the undeveloped latent image, if kept for a length of time—seven years was the length in the case under notice—practically disappears, and that the paper which was exposed in the first instance may be employed a second time, and on development will exhibit little trace of the original picture. Our correspondent's experiences are very remarkable; but, as in the case we dealt with in the leader to which he refers, we are strongly inclined to refer the cause of the phenomenon to damp or gas exhalations. We do not know whether the fading might also be induced by the possible fact that the emulsion was prepared with a bromide having free bromine in it; at any rate, this, we remember, was once suggested as the cause of the fading of the latent image. *Per contra*, has it not also been contended that the latent image, instead of fading, grows by long keeping, so

that after a time properly exposed plates will exhibit the phenomena of over-exposure? Manifestly, both theories cannot be right, and, except under abnormal conditions, we fail to see how they can be otherwise than wrong.

Methylated Spirit of the Old Kind.—We append an extract from a circular that has been extensively circulated throughout the country by a firm of methylated spirit makers:—

To Photographers, Microscopists, Scientific Workers, &c.—The Excise authorities having by a recent order prohibited the sale of methylated spirit by retailers and dealers, except with the addition of a certain quantity of mineral naphtha or oil—an addition which renders it extremely unsuitable for photographic and other scientific purposes—we desire to advise you that by applying to the Board of Inland Revenue they will grant you a special authority to use the ordinary pure methylated spirit upon your satisfying them of the *bona fides* of your application and intentions. The application should be made in the first place to the officer of Inland Revenue for your district, stating the purpose for which you intend to use the spirit, and the quantity you propose to stock at one time. When this special permission is granted you, if you will forward to us an order made out on one of the official forms provided by the Excise, we will be happy to supply you with the old style of methylated spirit, free from mineral oil or mineral naphtha, at the prices as noted below.

No doubt many of our subscribers have already availed themselves of the advice. It will be interesting and useful to our readers generally if some of them will let us know of their success.

A Useful (?) Hint.—There is a photographer "out West" (it could not possibly be anywhere else) whose handsome house is said to be a monument to the prevailing vanity of women. The photographer is rich, and this is how he became so. Years ago he is said to have noticed that, when he got a lady sitter with a pair of small feet, she generally liked to place herself so that her fairy-like supports were just visible, while the lady with the large mis-shapen hoofs kept her feet out of sight. From this he inferred that the latter person would much prefer to have two small feet also, and, if she had them, she would want to display them; and then he conceived the inspiration of keeping feet on hand, and supplying them to customers who needed them. He has a dozen pairs of them—small wooden feet, with adorable boots on them—and attached to each of them is about eight inches of leg, clothed in neat stockings, and with a hook about half way up. The lady with the glorious extremities is planted in a chair, with her massive limbs and copious boots hidden as far back as they can go without dislocating her knees, and then the artificial legs are carefully hooked on to the inner hem of her dress. Consequently, she looks like a person reclining in an easy attitude, with her beautiful feet exposed by accident, and, if she can stand the strain, the resulting photograph is a beautiful thing to look at. If she can't stand the strain, her real feet come forward just in time to keep the unnatural attitude from wrenching her joints asunder, and then she appears in the negative as a quadruped. Ha! ha! "Se non è vero, è ben trovato."

Aluminium Vessels.—The use of aluminium vessels for storing, measuring, and carrying liquids, in lieu of the costly glass measures—costly through the inevitable breakages—will commend itself to the photographer if, as we may expect, they are producible at a comparatively low price. It has been asserted by two German experimenters that such vessels are unsafe to use on account of their being soluble in various menstrua. Professor G. Lange, however, contradicts the statement, and publishes in the *Engineering and Mining Journal* an account of an investigation he has made into the subject. Not to burden our readers, we may extract a portion of the conclusions that he has arrived at, as stated in his paper. He says that many portable liquids are practically inert. "Taking the worst case found, that of acetic acid, we find a maximum attack of less than 5 milligrammes per 100 square centimetres in six days." Reduced to practical results, this is equal to a litre measure (nearly a quart), losing 5 milligrammes a day, even if it were always full, or 1 gramme in 200 days; and only in 55 years would it be reduced to half its weight. Alcohol pure of fifty per cent. strength lost ·61 of a milligramme in six days per 100 square centimetres of surface; and in the same time a five per cent. solution of tartaric acid lost 1·69 milligrammes; five per cent. solution of citric acid, 2·15; one per cent., 2·15 milligrammes; but a quarter per cent. of salicylic acid, 6.35—perhaps a misprint for 0·35. It will thus be seen that, for any but the most delicate operations, such vessels would be practically untouched during the ordinary usage of the dark room.

WHY PHOTOGRAPHS FADE.

II.

Before we make an examination into the contributory causes which the various manipulatory details of photographic printing tend to produce in the fading of our prints, it would be as well to clearly understand the action of the various agencies which cause this destruction.

By far the most serious that we have to contend against is the action of the sulphuretting compounds in the atmosphere; indeed, the injury produced from any other cause may almost be put down as due to preventable causes. For instance, if we take the action of damp, where the decomposition of the size in the paper forms a destructive mouldiness which causes the fading of the picture. Here we have conditions to which I do not consider it is fair to put such a thing as a photograph, because it is due to an injury to the paper itself, and I think common care should be taken with them, as with a water-colour painting or an engraving.

Albumen prints being the greatest sufferers from damp, if a photographer knows his prints are going to be hung in a damp place, in a showcase on a platform wall at a railway station, for instance, he had better put them in nearly boiling water for a short time, to remove the size before mounting them.

The destructive action of oxidising agents is one which, in the case of gelatino-silver emulsion papers, is not receiving nearly the attention at the present time, either by the manufacturers or photographers generally, which I think it ought to. I am not referring so much to the substances used in mounting, which generate an acid by fermentation, but to the use of acids, and especially to the use of alum, whether in the emulsion or when hardening and clearing the prints.

When I say that in a series of experiments which I made some time since, to test the relative capability of various photographic prints to withstand oxidation, I found that in the case of one popular emulsion paper in the market that the images on the prints were destroyed, indeed, there was not the slightest trace left of a picture, and I think it most probable that this was due to the presence of alum in contact with the silver in the gelatine film, it having been added during the preparation of the emulsion, and I am much afraid that in the future this paper may get a bad name in consequence; and the worst of it is, emulsion papers of all kinds will suffer as well. The public will get to group them as all bad alike.

Possibly clearing the prints after development with a weak acid bath, *if they are thoroughly washed afterwards before being put in the hypo bath*, may not do much harm, but it all depends upon the thorough washing.

With albumen prints I do not think we have the same need to fear injury by oxidation as with the gelatino-chloride or bromide developed prints, as the albumen evidently acts as a preservative.

To return to the subject of the injury to the prints caused by sulphuretting compounds in the atmosphere, acting upon the paper or the substance forming the image. With regard to the paper, of course the high lights of the picture depend upon its whiteness, and, for myself, I do not consider that any photograph can be called permanent if there is any loss of the purity in the whites, due to chemical compounds left in the paper, which in time cause the latter to yellow under the action of the sulphuretted hydrogen in the atmosphere.

Indeed, in nine cases out of ten, the fading of a photograph is due to the yellowing of the whites of the picture, and not to the obliteration of the image itself, so that, practically speaking, it is of far more importance to manufacturers as well as photographers to look after the purity of the paper used, and to see that nothing is left in it which will in time cause it to yellow, than even about the stability of the image itself. Under ordinary conditions an image of silver can be made sufficiently stable, but, of course, a *printing-out* process in another metal which did not change into a yellow sulphide would be better if it could be worked with as much certainty, and with as few manipulatory drawbacks, as a silver printing-out process.

The great requirement for a sample of paper to be adapted for photographic purposes is, that it must not only be uniform in texture, but like an engraving, or for a water-colour painting, must not con-

tain in the sizing, &c., anything that will cause it to yellow in a few years.

Some experiments which I have made, by subjecting about fifty samples of papers prepared for photographic, drawing, and other purposes, to the action of sulphuretted hydrogen, showed that the photographic and the good drawing papers answered these conditions perfectly, and that they did not in themselves contain anything injurious. I wish I could say the same after these papers had been sensitised, or otherwise prepared for photographic uses. But when one sees the white paper of a so-called permanent photograph turned to something the colour of an Australian sovereign, one begins to think it is about time to inquire into the subject.

HERBERT S. STARNES.

IMPROVEMENTS IN THE TELE-PHOTOGRAPHIC LENS.

In the paper that I contributed to the Camera Club I pointed out that, in the tele-photographic lens there exhibited, I believed I had accomplished the best possible result with the least expenditure of optical means. That lens, as your readers will remember, consisted only of two cemented combinations. It is well known that any single aplanatic lens can only define properly for the axial pencil, the definition falling off very rapidly when the pencils become even slightly excentrical, for this reason: In using two combinations only, the correction for the excentrical pencils has to be accomplished by a proper form ascribed to the negative element. The main drawback to this lens is that, although it may be corrected for outstanding spherical aberration *for any particular plane*, it is not rectilinear, and, moreover, it is impossible to make it so.

At the time of reading the paper I mentioned that I was engaged upon the construction of a series of negative elements, to be employed in conjunction with rapid portrait lenses of short foci.

As your readers are well aware, the main object in photographic lens construction is to attain the best possible definition for the excentrical as well as the central pencils; and, in rapid portrait lenses, the number of elements employed enable this to be carried out to a much greater extent than is the case with a single combination lens.

The improvement that I have made consists in employing, in conjunction with a particular type of portrait lens, a compound symmetrical negative element that is practically aplanatic in itself, and is also corrected throughout its entire field, but of negative focus. This construction permits of an excellent correction for the excentrical as well as the central pencils, and reduces distortion to a minimum. Another feature in employing the particular form of portrait lens (introduced by my late father) is the possibility of correcting the complete combination (positive and negative) for outstanding spherical aberration throughout the entire field, for any chosen plane of object or screen. If a lens of this form is properly corrected for a near object, it will be found, on employing the same instrument upon a distant object, that it is no longer perfectly corrected, but outstanding aberration asserts itself. By employing the form of portrait lens illustrated in Fig. 2, a slight separation of the back lens will entirely remove this.

This matter might strike one at first sight as being of little importance; but such is not the case, in that the main feature in the utility of this type of lens for ordinary purposes consists in the employment of *as large an aperture as possible*, first on account of rapidity, and secondly on account of the fact that the larger the aperture the larger is the field that is covered or angle included. Were it not for the possible means of correction referred to by the separation of the back elements of the portrait combination, the only other method of correcting the outstanding aberration would be the employment of diaphragms, that would very materially affect both the important considerations.

I have been asked, on frequent occasions, whether still larger amplifications could not be attained with the same camera extension? This, of course, is possible by employing negative combinations of shorter foci than the particular ones which I have considered a useful mean both for the angle included and adequate intensity.

It is a very simple matter for a given extension of camera to make the amplification very much greater than that which I have adopted; but the drawback is that the angle included again becomes very small, and the loss of light considerable.

DESCRIPTION OF DRAWING.

Comparing Fig. 1 and Fig. 2, the positive element P, represented as a single lens in Fig. 1, is replaced in Fig. 2 by a portrait lens P, and the single negative element N, in Fig. 1, is similarly replaced by the double combination negative aplanatic system N in Fig. 2.

When the lens L of the portrait combination is in its primary position, the correction of the negative combination is adjusted for near objects; but, if the lens be focussed on receding planes, by the

FIG. I.

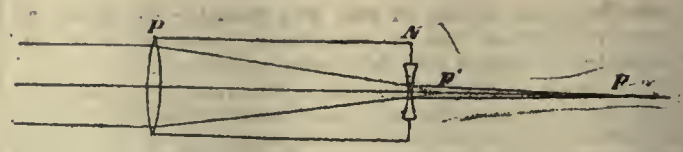
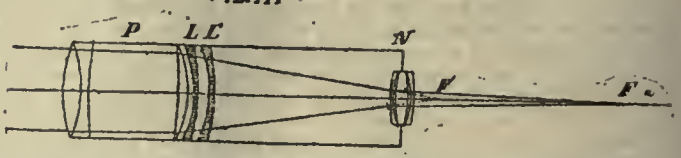


FIG. II.



slight adjustment of unscrewing the back cell, and slightly separating the components of the posterior combination, a perfect correction for spherical aberration can be attained.

Again, if a telephoto lens of any fixed construction be focussed upon an object with a short extension of camera, it will be found that it is not perfectly corrected for a greater extension of camera. This, again, may be corrected in a similar manner by a slight adjustment of the back lens L of the portrait combination. T. R. DALLMEYER.

ELEMENTARY NOTES ON PHOTOGRAPHIC LENSES.*

STOPS.

THE *diaphragm*, or *stop*, is a metal plate having a circular aperture, which becomes the effective area of the lens by only allowing a beam of light its own diameter to be utilised in forming the image. As the rapidity of the lens depends entirely on the amount of light that it transmits to the plate, it is directly proportionate to the area of the stop. This area varies as the square of the diameter, so that, with a given lens, a stop of one inch diameter is four times as fast as one half an inch.

The rapidity does not depend on the actual measurement of the stops, but on their relation to the focus of the lens, their size being expressed in fractions of the focus, so that a stop one inch in diameter, used with an eight-inch focus lens, would be called *f*-8, generally written as a fraction, in which the letter F takes the place of the numerator, the fractional figure the denominator.

Stops are usually arranged in sets, the following fractions of the focus being the standard of the Photographic Society of Great Britain, and almost universally adopted:—Focus divided by 4, 5½, 8, 11, 16, 22, 32, 45, and 64. Each of these is twice the area of the following ones, and consequently each requires double the exposure of the preceding.

The *full aperture* or largest stop of a portrait lens is generally one-fourth of the focus, in a few special cases one-third to one-half. The euryscope *f*-5½ or *f*-6. The rapid rectilinear, one-eighth; the single landscape, one-eleventh to one-sixteenth; the wide-angle rectilinear, one-sixteenth.

All lenses are of equal speed when the aperture is the same proportion of the focus, the rapid types gaining their rapidity from their construction allowing the larger aperture to be used. A portrait lens, when stop *f*-16 is inserted, is no quicker than a wide-angle rectilinear with the same aperture.

Photographers generally use stops for one purpose far more than any other, viz., obtaining depth of focus, or the power of rendering objects at different distances reasonably sharp at the same plane. Absolute definition in the various images is impossible, but in ordinary work a slight departure from mathematical exactness in this respect is an advantage rather than otherwise. If a prominent feature in a landscape is sharply focussed with the full aperture of the lens, most other parts are fuzzy or out of focus, while by inserting a stop all may be rendered fairly sharp. No amount of reduction in the size of the stop will change the plane of greatest sharpness for any object, or alter the relative distances of correct focus; but, by reducing the diameter of the circle of light that takes the place of what should be a point, it produces apparent sharpness. When a large stop is used, if one object, whose focus is at A in diagram 9,

* Continued from page 155.

is sharply defined on the ground glass, all points in another, whose focus is at B, will be represented by circles of light, whose diameter is equal to

the heavy line in the diagram, and be simply a hazy mass. By inserting a stop the diameter of these circles is reduced in proportion to its size, as in the lower figure, and the object appears fairly well defined.

All lenses of the same focus have equal depth when used with the same stop, though many opticians will tell you in their catalogues that certain lenses that they manufacture possess "marvellous depth of focus." This is misleading; it is entirely independent of the construction or quality of the lens, as the diagram will show.

With an aperture of the same value, the depth of focus varies in inverse proportion to the focus of the lens, so that a sixteen-inch lens would possess only half the depth of an eight-inch if *f*-16 were the stop used in each.

From this it follows that the depth of focus depends on the actual size or measurement of the stop, and is not influenced by the focus of the lens; a stop, a quarter of an inch diameter, would give the same depth when used with a five-inch lens as it would with a twenty-inch. This is a somewhat startling proposition to most photographers, and it was first pointed out by our Mr. W. E. Debenham; diagram 10 will

easily prove its correctness. If points C and D, one inch apart, represent the points of sharpest focus for certain objects with a twenty-inch lens, a stop one quarter of an inch diameter, being *f*-80, would cause the diffusion from D to be $\frac{1}{20}$ inch diameter, where it met the focussing screen at C. By the substitution of a five-inch lens, the distance between the focal planes would be one quarter of an inch only, as E and F; and a quarter-inch stop being *f*-20 for this lens would make the diffusion one-twentieth of the distance E F, or $\frac{1}{20}$ inch, the same as the larger lens.

A second use of stops is to confer flatness of field. Not only is the curve of greatest sharpness flattened when the smaller stops are used, but the diffusion due to the curvature is reduced at the same time, and still greater apparent flatness is obtained.

In those lenses that give unequal illumination, the amount of light reaching the different parts of the plate is equalised by reducing the aperture. The reason for inequality of lighting was given in diagram 8; by comparing it with No. 11, it is evident that, by inserting a moderately small stop, the oblique ray is transmitted unbroken equally as the central.

In considering the subject of the diaphragm, it is best to give a little attention to its influence on the character of the image, as this is purely an optical question, although intimately connected with the artistic aspect of photography.

It is very frequently assumed that a picture taken with a large stop is

more brilliant than if a small one had been used, the principal basis for this assumption being the brilliant effect on the ground glass, with all the colours vividly portrayed in the one case, contrasted with the dull, almost uniformly dark, and lifeless scene that takes its place in the other. This is simply due to the amount of light in the latter instance being too small for the gradations to be visible to the eye; the relation between the high lights and deep shadows, and the intermediate range of tones is exactly the same in each case, and, if the exposures given with the two stops were correctly proportioned to their respective sizes, the negatives would be equally brilliant. They would not be the same, however, in other respects, the aperture influencing largely the atmospheric effect.

In a landscape negative, taken with a very small stop, the most distant portions are practically as sharp as the foreground, and the effect of distance is lost, while, if the aperture were enlarged just sufficiently to throw the distance very slightly out of focus, to the extent of slightly diffusing or softening the outline, the effect of atmosphere intervening between the observer and those planes of the picture is secured, and gives "distance" independently of the linear perspective rendering. Care must be exercised to avoid exaggerating this diffusion or softening of outline, and so destroying the effect that it is intended to produce. In many photographs sent to our leading exhibitions the advocates of the "Naturalistic" or "Impressionist" school have carried this diffusion to such an absurd degree that the distance simply becomes a meaningless mass devoid of all form and character, and, instead of suggesting soft, hazy distance, its only effect is to irritate the eye—the extreme opposite from that which would be produced by Nature herself.

It may be considered a correct principle, that softening of outline should never be sufficient to destroy the texture, form, or character of the object photographed.

The general principles governing the use of stops may be briefly expressed: the depth of focus and atmospheric effect depend on the actual size of the stop, the exposure on its relation to the focus of the lens.

HENRY W. BENNETT.

(*To be continued.*)

NOTES ON SOME NEW RAPID ORTHOCHROMATIC COLLODIO-BROMIDE EMULSION PROCESSES.

GELATINE dry plates have now taken such a hold on the photographic world that it would be almost useless to expect any general return to collodion, whatever its advantages might be. For all ordinary purposes ready-made gelatine plates must remain the most convenient medium for the sensitive film. There are, however, many photographic operations in which certain qualities are required in the negative or transparency which are far better obtainable with collodion than with gelatine, and this is the case with most of the copying processes used for the reproduction of drawings and works of art in line or half-tone. Here, in Calcutta, we are obliged to use the old wet collodion process for all our copying work in the Survey of India Office, and the same is the case in most of the establishments in other parts of the world working process blocks and other photo-mechanical processes for reproduction of line-work. Now, as some of you may know, the practice of the wet collodion process is attended with many inconveniences in the way of nitrate of silver baths, which are difficult to preserve in good order, and keep one's fingers in a state of perpetual blackness, the drying of the films, and other troubles, which may be all avoided in working an emulsion process. As collodion processes go, the wet process is fairly sensitive, and though far below gelatine in sensitiveness, it is, as a rule, much quicker than the ordinary dry collodion processes, and for this reason the latter have, so far as I know, not generally come into use in establishments like ours, where a large amount of copying work is done, and wet collodion has so far held its own.

I have often thought that the experience gained in making the highly sensitive gelatine emulsions might possibly be applied to the preparation of very sensitive collodio-bromide emulsions, and it has, in fact, already been done by Captain Abney and others, but with very little practical experience in emulsion-making with collodion, one did not quite know what process would be likely to best answer for ordinary work.

When I was in Europe last year, I was told in Berlin of an orthochromatic collodion emulsion, prepared by Dr. E. Albert, of Munich, which was said to give very good results, and to be very sensitive. So, being afterwards in Munich, I paid a visit to Dr. Albert, who very courteously showed me a good deal that was interesting, and I was specially impressed by the sight of his negatives of copies of paintings taken with his orthochromatic collodion emulsion. I have never before seen such fine negatives, full of the most brilliant soft gradation and detail, and of the beautiful violet-purple colour of the best wet collodion negatives which one misses so much in gelatine, and which indicates, moreover, an exceeding fineness of deposit. The process seemed a most valuable one, and I should have got some of the emulsion for trial, but was told that it would not keep in a hot climate. Dr. Albert's emulsion has been on sale in Europe for the last year or two, but little was known of the process of preparing it, except that the coloured solution contained one of the eosine dyes and some picrate of ammonia, the latter serving in place of a yellow screen.

Shortly after my return to Calcutta last November, I read in *Paris Photographe*, M. Nadar's excellent monthly, an extract from the *Correspondenz*, of a paper by Dr. A. Jonas, of Vienna, describing some experiments he had made, at Dr. Eder's suggestion, in preparing an emulsion similar to Dr. Albert's. It seemed to me worth trying these formulæ, and when I did so, I was quite surprised at the results obtained, and especially by the wonderful sensitiveness conferred on the emulsion by the addition of the strong picrated erythrosine-silver solution, so that the coloured collodion emulsion was about as sensitive as ordinary gelatine dry plates. No such enormous rise in sensitiveness is noticeable in orthochromatising gelatine dry plates with weaker erythrosine-silver solutions.

Dr. Jonas's method of working, as given at length in the *Photographisches Correspondenz* for July, 1891, is briefly as follows:—

The employment of the silver and ammonia method of preparing the silver-bromide emulsion, which is so successful with gelatine, does not answer so well with collodion, because the free ammonia acts injuriously on the collodion. This difficulty is overcome in the following process by neutralising the free ammonia with acetic acid; and, moreover, the emulsion so obtained is exceedingly fine in the grain and creamy.

SOLUTION I.

Ammonium bromide	64 grammes.
Distilled water	80 c.c.
Absolute alcohol	800 ,,
Thick collodion (four per cent.)	1500 ,,
Glacial acetic acid	65 ,,

The ammonium bromide is first dissolved in the water with heat, then the alcohol, collodion, and acetic acid are added in order.

For the collodion I have used a mixture of equal parts of four per cent. solutions of Schering's celloidin, and of a collodion made with Morson's pyroxyline, both in equal parts of ether and alcohol, the same as ordinarily made up in the office for copying maps, but thicker.

SOLUTION II.

Crystallised nitrate of silver	80 grammes.
Distilled water	50 c.c.

The silver salt is dissolved in the water with heat, and then strong solution of ammonia is added in small proportions till the precipitate is redissolved (this takes about 72 to 75 c.c.); 800 c.c. of alcohol, warmed to about 45° C. (113° Fahr.), are then added. This solution should remain clear and colourless. If it turns brown, the alcohol is impure. Both solutions can be prepared in daylight.

When solution II. is ready, it is poured in a thin stream into No. I., the latter being well shaken meanwhile. This operation must be performed in a dark room, with orange light. Solution II. must be kept heated from 40° to 50° C. (103·5° to 122° Fahr.), otherwise the silver-ammonia salt will crystallise out; it is desirable, therefore, to stand the solution from time to time in a water-bath heated to the above temperature. The mixing of the above quantity of emulsion should take about ten minutes. The emulsion is well shaken up and tested for acidity. A little of it being poured on glass, and wetted with water, should show a slightly acid reaction. If alkaline, it is acidified by adding acetic acid drop by drop. It is then well shaken for about a quarter of an hour, and, after standing for an hour, is poured into five or six times its volume of water. The silver bromide collodion separated out is collected in a clean linen cloth, and the ends of the latter being tied so as to form a bag, is washed in running water for about a couple of hours. It is then finally washed with distilled water, and spread out upon a thick layer of blotting-paper to dry, which takes one or two days. The dry silver bromide collodion can then be kept in black bottles in a dark place for use as required.

I found no difficulty in following Dr. Jonas's instructions, but the mixed emulsion was kept for a day before being washed, with the object of getting greater sensitiveness, and it might possibly be kept even longer with advantage, because I noticed that the unwashed emulsion gained sensitiveness by keeping, and also became much more uniform in texture, though thinner. After a week it became very thin.

To make the final emulsion, dissolve—

Silver-bromide collodion	6 grammes.
Alcohol	40 c.c.
Ether	60 ,,

The sensitiveness of the emulsion is, after an hour, about ½° Warnerke. After twenty-four hours' ripening at 60° to 70° Fahr., it increases about two or three times, and the colour of the silver bromide changes from red violet to blue violet.

All chemicals must be perfectly pure, and the greatest cleanliness must be observed in all the vessels employed.

The mixed washed emulsion can be kept ready for use; some I prepared about a month ago is now in very good order.

I have found that the emulsion can also be used unwashed with good results. At first it gives rather dense pictures, with very clear shadows; but, after a few days, it is more sensitive, and the image not quite so dense and hard; the film also becomes more uniform in texture. After a week, though more sensitive, it gives thin images slightly inclined to fog with the para-amidophenol developer, and the results obtained with the washed emulsion are certainly better. The unwashed emulsion would probably work well if used within three or four days of being made up, and would, of course, be more economical for the work on the large scale.

COL. J. WATERHOUSE, S.C.,
Assistant Surveyor-General of India.

(To be continued.)

ELECTRIC LIGHTING FOR PHOTOGRAPHERS.

IN our last issue we mentioned having inspected an electric lamp for studio purposes made by the Pilsen Electric Company. Since then we have received several requests for a fuller description of the apparatus employed, with which we now take the opportunity of complying.

The apparatus consists primarily of a suspension arrangement, a reflector, and a large current arc lamp. The suspension arrangement consists of a bar held at its centre, with the lamp and reflector hung at one end, and a

counterweight at the other. This arrangement allows the lamp and reflector to be swung in any direction without effort, so that the light can be directed on to a sitter in whatever way suits the idea of the operator. The reflector, which is made of metal and is suspended by trunnions from the end of the suspension bar, is either papered or painted a dull white on the inside, and takes the direct light from the arc, which it diffuses perfectly.

The arc lamp itself takes a current of 50 ampères, with a pressure of 50 volts across the terminals of the lamp. Its carbons are in line with the axis of the reflector, which generally is at 45 degrees to the vertical, and the most intense light from the arc is thrown into the back of the reflector and sent out direct, so that, by hanging the lamp at an angle, the only light that is lost is that which is absorbed by the white background.

Mr. Liebert, the Company's manager, after many experimental trials, has got this large current lamp to burn noiselessly for hours together. Such a result is difficult to attain, as most photographers know, because, when the carbons are not in a vertical line, the arc has much more tendency to wander about the points of the carbons, producing a roaring and spluttering that unsteadies the light as well as the nerves of the sitter, and also because large-current arc lamps are more difficult to regulate than small-current ones. To explain why this is the case, it is only necessary to point out that an eighth of an inch movement in the carbons may alter the energy consumed by the arc by two or three horse-power.

These difficulties have been got over in the arc lamp under notice, by using specially prepared carbons, which, when properly centered, keep the arc central, provided the carbons feed together without allowing the arc to get too long.

The lamp is a direct current lamp, and when it is burnt off a supply company's mains (which are generally at a difference of pressure of 100 volts) a resistance frame to put in series with the lamp can be supplied. When a power plant for the lamp is put up by the Company, a four horse-power (nominal) gas engine, a shunt wound dynamo, and a smaller resistance frame to put in series with the lamps are supplied.

We can testify to the steadiness and noiselessness of the lamp, which is already being worked most successfully by several portrait photographers. We gather that the shape of the "reflector," as shown in the cut, will be modified so as to narrow the angle over which the large mass of light emitted is diffused. Altogether, we are persuaded the system is a thoroughly good and practicable one, and well qualified to meet the requirements of the great number of photographers who are anxious to adopt electric lighting at comparatively little outlay.

THE MADDOX FUND.

We append a letter from Mr. Andrew Pringle, indicating that this fund closes, for the United Kingdom, on the 31st of the present month, and also giving a list of the contributions received or promised up till the end of February. We are aware that there are many additions to be made to the list, which, before it closes, will doubtless be greatly enlarged. It should be borne in mind that the American and Continental funds are separate in administration from the English fund.

It is only just to ourselves and our readers to here point out that the final appeal and list of subscriptions already published by our contemporaries were both unauthorised and incorrect, the editors of those journals treating communications sent to them in their capacities of members of the committee as matter for publication, although the suggested circulars were plainly marked "Draft."

In recommending the fund to the favourable notice of those of our friends who have not yet contributed to it, we deem it necessary, especially for the information of our younger readers, to lay stress on the fact that the claims of Dr. Maddox to the credit of his gelatine emulsion experiments were admitted, practically without dissent, for a great many years, and that it was only when the question of giving him some pecuniary recognition of those experiments was mooted that opposition to his claims broke out among a small number of persons, whose fertility of imagination and command of invective are apparently as great as their wilful distortion of photographic history and their envy of the substantial recognition of the value of Dr. Maddox's experiments, which is so freely forthcoming in various parts of the world.

"MADDOX TESTIMONIAL FUND.—FINAL APPEAL.

"*Cromwell House, Bexley Heath, Kent,*
"*February 29, 1892.*

"Since its start, this fund has been progressing satisfactorily, but the Committee feel that some period must be fixed for the closing of the Subscription List, and the *31st of March* has been chosen as the date for closing the list and making up accounts. It is proposed that the testimonial, when presented to Dr. Maddox, shall be in some such terms as follows:—'This Testimonial is presented to Dr. Richard Leach Maddox, in recognition of his services to photography, and especially of his investigations in connexion with gelatine emulsion.' Appended is a list of subscriptions paid or promised in the United Kingdom, and it is hoped that those who sympathise with the object will give notice of their intention to subscribe, stating the amount as soon as possible to the Hon. Treasurer.

"COMMITTEE:—James Glaisher, F.R.S., *Chairman*, Captain W. de W. Abney, R.E., C.B., F.R.S., W. S. Bird, George Davison, A. Haddon, A. H. Harman, Charles W. Hastings, T. C. Hepworth, Dr. A. C. Mercer (New York), Henry Sturmey, J. Traill Taylor, W. H. Walker, Sir H. Trueman Wood, F. York. *Treasurer*, Francis Cobb, Riverdale, Twickenham."

SUBSCRIPTIONS.

	£	s.	d.
The Britannia Works Co.	100	0	0
Camera Club list	27	16	0
R. W. Thomas & Co.	25	0	0
BRITISH JOURNAL OF PHOTOGRAPHY	10	10	0
Nelson, Dale & Co.	10	10	0
Photography	10	10	0
Amateur Photographer	10	10	0
The Autotype Co.	10	0	0
M. Whiting	5	5	0
J. W. Swan	5	0	0
F. York	5	0	0
A. L. Henderson	5	0	0
N. Bannatyne	5	0	0
Colonel G. M. Sternberg (U.S.A.)	5	0	0
Thomas Comber	5	0	0
Spen Valley Photographic Society	3	10	0
F. W. Verel & Co.	3	3	0
Dundee and East of Scotland Photographic Association	3	3	0
Colonel Durnford	3	0	0
A. W. Chapman	3	0	0
London and Provincial Photographic Association	2	14	6
George Mason	2	2	0
John Spencer	2	2	0
Albion Albumenising Company	2	2	0
Photographic Review of Reviews	2	2	0
Leeds Photographic Society	2	2	0
Aberdeen Photographic Society	2	2	0
James Glaisher	2	0	0
W. Bedford	2	0	0
H. J. Channon	2	0	0
R. W. T. (Exeter)	2	0	0
F. C. Sharp	2	0	0
R. W. T.	2	0	0
P. Lange	2	0	0
Jeffs & Sons	1	14	0
West Kent Amateur Photographic Society	1	6	0
J. B. B. Wellington	1	1	0
F. Beasley	1	1	0
H. M. Hastings	1	1	0
Manchester Amateur Photographic Society	1	1	0
F. Hollyer	1	1	0
Annan & Son	1	1	0
William Lang, jun.	1	1	0
Sir H. Trueman Wood	1	1	0
W. L. Chadwick	1	1	0
T. C. Hepworth	1	1	0
L. E. Clitts	1	1	0
C. G.	1	1	0
W. J. Harrison	1	1	0
Ulster Amateur Photographic Society	1	1	0
H. E. Davis	1	1	0
Dr. Massey	1	1	0
General Burlton	1	1	0
Professor Stebbing	1	0	0
Thomas Curties	1	0	0
Société d'Excursions de Paris	0	16	0
Commander C. E. Gladstone	0	10	6
R. N. E. College (Devonport) Amateur Photographic Society	0	10	0
F. Lloyd	0	5	0
Total	£310	2	0

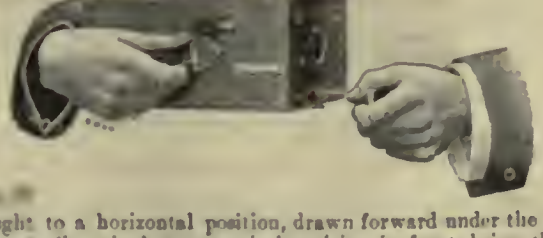
ANDREW PRINGLE, *Hon. Secretary.*

Our Editorial Table.

THE SHUTTLE HAND CAMERA.

GEORGE HOUGHTON & SONS.

THE Shuttle hand camera has the advantage that it does not much exceed the size of the plate for which it is intended, and the arrangement for changing plates is simple and novel. The plates previously placed in sheaths are stacked in the back of the camera, and after the first exposure, by ingenious mechanism (the act of changing being shown in the cut), the last or back one of the series



is brought to a horizontal position, drawn forward under the others, and eventually raised to a vertical position in front, being then on the focussing plane. The operation of changing the plates also sets the shutter, the movement being the simple drawing out of a rod and pushing it home.

THE Leeds Photographic Society's syllabus, rules, list of members and list of books in the library, is comprised within the dimensions of a neat little book, whose natural resting-place would be the waistcoat pocket. It also contains spaces for memoranda.

WE have received the results of meteorological and magnetical observations at Stonyhurst College Observatory for 1891. The

compilation, which is by the Rev. W. Sidgreaves, S.J., is of interest to astronomers, meteorologists, and others, to whom, no doubt, the observations recorded will be of abiding value.

Photographic Mosaics, 1892.

Edward L. Wilson, New York.

Following a *resumé* of the progress of photography during 1891, drawn by the editor from the writings of the principal photographic authors, *Mosaics* presents its readers with a large number of specially written articles, having familiar names appended to them, and all eminently readable. The book is illustrated to a more liberal extent than in former years, the frontispiece being a portrait of Mrs. Potter Palmer, President of the Board of Lady Managers of the World's Columbian Exposition, evidently "a fine figure of" a lady.

The Art of Retouching Negatives.

London: Marion & Co.

A new edition of Mr. Robert Johnson's work under the above title indicates that it has been favourably received by the public. Mr. Johnson treats on the texture and modelling of the eye, the mouth, the hair, and the other portions of the figure which require the aid of the retoucher. Accessories, backgrounds, the finishing of photographs in oils and water colours and composition, all fall under the author's treatment. We are rather unable to understand his meaning in saying (in a chapter devoted to "The Eye Compared with the Lens and Camera") that a single lens is unsuitable for groups because of its making the near figures on a larger scale than those farther away. This is not a special property of any lens, single or compound, but one in strict accordance with the laws of perspective.

Bromide Paper: Instructions in Contact Printing and Enlarging.

By Dr. E. A. Just. Bradford: Percy Lund & Co.

This is a condensed translation by Messrs. W. E. Woodbury and H. Snowden Ward of a work by Dr. Just, published in Vienna during the year 1889. It is perhaps the most exhaustive monograph on the subject yet issued, no detail connected with bromide printing and enlarging being, so far as we can see, omitted. Especially valuable are the sections treating of the various systems of lighting which may be employed in printing, while that which deals with enlargement by projection is equally clear and full. A great deal of the matter is, however, written from a purely scientific standpoint, which, if it does not appeal to the ordinary level of photographic intellect, will not perhaps lack appreciation at the hands of the more advanced practitioners. The work has a capital frontispiece in bromide from a negative by Mr. Wellington, and there are over thirty well-drawn illustrations in the text.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 4002.—"An Improved Dish for Developing Dry Plates used in Photography."—A. Hossack.—*Dated March* 1, 1892.

No. 4101.—"Improvements in Photographic Cameras."—A. Clarke.—*Dated March* 2, 1892.

No. 4122.—"Improvements in Shutters for Photographic Cameras."—E. H. P. Humphreys.—*Dated March* 2, 1892.

No. 4138.—"Improvements in Photographic Cameras."—H. G. M. Conybeare.—*Dated March* 2, 1892.

No. 4243.—"Improvements in Photographic Cameras."—M. M. Smith.—*Dated March* 3, 1892.

No. 4245.—"Improvements in Photographic Cameras."—E. H. P. Humphreys.—*Dated March* 3, 1892.

No. 4411.—"Improvements in the Separation of Oxygen, Nitrogen, or other mechanically mixed Fluids, and obtainment thereof."—J. H. Parkinson.—*Dated March* 5, 1892.

PATENTS COMPLETED.

Improvements in, and in connexion with, Photographic Printing Apparatus, an Improved Method of Preserving Sensitised Paper, and a Protective and Adhesive Solution therefor.

No. 1953. Richard John Wynkoop and John Morris Kemp, both of Paterson, County of Passaic, and State of New Jersey, U.S.A.—*February* 3, 1892.

This invention relates to an improved machine or apparatus for rapidly printing and trimming or cutting photographs.

The object is to provide means for contact printing, and the invention consists in apparatus for holding films or sensitised paper in close contact with a photographic negative during exposure, and in certain other novel features of construction and combination of parts, as will be hereinafter described and pointed out in the claims.

[Here follows a detailed description of several drawings illustrative of the invention, after which the patentees proceed]:—

For protecting the sensitised surface of the photographic paper, and for preventing chemicals or impurities in the back of the paper from contact with the sensitised surface and destroying it as a whole or in spots, we provide a preservative solution for application to the back of the sensitised paper, which will hold back the chemicals or impurities therein from contact with the sensitised surface, thus enabling the paper to be kept for any length of time without injury to the sensitised surface.

In addition to the preservative quality of our solution, it is also adhesive, so that the ordinary paste for mounting prints on cardboard is dispensed with.

The ingredients generally employed are as follows, and in about the proportions named, to wit:—

Gelatine or glue	2 ounces.
Water	40 ,,
Alcohol	10 ,,
Sugar	1 ounce.
Chrome alum or alum	5 grains.
Glycerine	2 drachms.

These may be combined in any approved manner, but we prefer to dissolve the gelatine or glue and sugar in the water, and mix therewith the alum and glycerine, after which the alcohol is added. When applied to the back of the sensitised paper it produces a thin pliable coating or skin, which, as previously stated, prevents impurities on the back of the paper from contact with the adjacent sensitised surface, and also, when moistened, forms an excellent adhesive for the cardboard or other back.

New or Improved Figures or "Puppets" for Magic-Lantern Displays, and Apparatus or Mechanism for actuating same or the like and in connexion therewith.

No. 3727. William Cheffins, Holbeach, Lincolnshire.—*February* 6, 1892.

This invention consists of (firstly) transparent automaton figures, representations, or puppets for magic-lantern displays—that is, figures, &c., which are transparent, so that the colouring, shading, &c., of such figures, &c., is, when shown in the magic lantern, reproduced; and (secondly) this invention consists of apparatus or mechanism for actuating such figures or the like, or in connexion therewith, so that such figures or puppets, being arranged, constructed, and mounted in conjunction with the "slide" or framework in which they are held while being displayed in the lantern, that such figures or puppets can be caused to move as in the action of walking, running, boxing, fencing, or gesticulating, or other movements, grotesque or otherwise.

Or these transparent automaton figures or representations may be mounted in any other suitable or convenient manner (as on a trapeze), and actuated in any well-known or suitable manner independently of my improved actuating mechanism, &c., which latter again may be used independently of my new or improved transparent automaton figures.

Heretofore, slides having moving figures or representations have been used in magic lanterns, as I am well aware, but such moving figures or reflections have been produced by painting, or otherwise producing pictures or figures on the glass or transparent part of the slide itself, and then moving such glass about—this has shown a reflection of a moving figure, &c., but the effect has been rather of a "fixed" nature and the success doubtful—as the fixed figure could only be made to move, and not the separate parts thereof, as with my automaton transparent figures.

My invention is as follows:—

First: The automaton figures, representations, or "puppets" (as I call them) are made of talc or any like equivalent transparent substances. For the sake of example, I will describe one figure only, and that the figure of a man.

The legs are jointed to the hip, and the knees also jointed if desired, and the arms jointed to the shoulders, as also the head and neck if desired.

The face, hands, clothes, &c., may be suitably coloured as desired, care being taken to leave the parts transparent where required, whilst those parts where the joints occur, or mechanism connected, or other parts also, may be rendered opaque so as to hide same.

Such "puppets" may then be arranged and mounted, and actuated or not as desired in any well-known or suitable manner, and one or more of these "puppets" may be arranged to perform and be shown at one and the same time.

These puppets are particularly adapted to be displayed and actuated by the following means, which constitute the second part of my invention, viz.:—

Second: Continuing the example of a figure of a man, one foot of the figure is attached to a projection or part of a peculiarly shaped support, the other foot being similarly attached to a second corresponding support.

Each such support may be advantageously formed of tin plate or other thin sheet metal, and has a wide turned-up edge or flange formed at right angles to the plane of the figure, &c. This flange is to form a bearing surface upon one edge of a kind of trough slide or magic-lantern slide, having a space between two transparent glasses, in which space these figures can be displayed.

These two supports (to which respectively the two feet of the figure are attached) are combined, and retained together either by the one having a bolt head thereon, working in a longitudinal or other slot in the other, or by the one having a lug thereon carrying a headed pin, which works in a slotted link pivoted to a similar lug on the other, or equivalent mechanical arrangement, so that these two supports can freely move in the direction of the planes thereof, but not away from or apart from one another.

Any suitable lever, cranks, pulleys, belts, bands, or connexions may be used in addition to the above-described invention, if required or desired.

Improvements in the Method of and Means for Modelling by the Aid of Photography.

No. 22,825. Hermann Pötschke, 4, Bergmannstrasse, Berlin. —*February* 6, 1892.

This invention relates to a method of and means for modelling by the aid of photography either on a reduced or enlarged scale, or to the natural size, and which is generally applicable to all objects which may be conveniently photographed, as hereinafter described, but is more particularly intended for the modelling or production of portrait busts.

In proceeding according to these improvements there are four principal operations, which consist in: (1) Taking photographic negatives; (2) producing silhouettes; (3) composing or joining together the silhouettes; and (4) filling in the intermediate spaces left between the silhouettes.

It will be assumed that it is desired to model the portrait bust of an individual. If we imagine a series of vertical planes, each passing through the vertical axis of the head of this individual, each of the planes will divide the surface of the head and bust of the person into two equal parts. If, again, we assume each of the planes to be non-reflecting and opaque, and a strong light to be exhibited on one side, it will be evident that only the lighted part can be photographed. If, then, successive planes be employed in successive longitudes, or if the sitter be rotated through successive angles in the same plane, a series of photographic silhouettes may be obtained covering the whole surface of the head and bust of the sitter.

The negatives must be taken in a chamber, the floors, walls, and roof of which are non-reflecting.

In order to secure the axis of the head of the sitter in a vertical line, a flat horizontal ring or head-rest is employed. By means of radial studs or adjusting screws in the ring, the head may be brought into the exact desired position and fixed there. It is preferred to employ a rotating chair, and it is more convenient to rotate the sitter than the source of light, screen, and photographic apparatus.

During the intervals which separate the taking of the negatives, the chair and sitter are turned through a certain number of degrees each time, until the number of exposures required for the whole circumference have been made. The number of degrees or the angles through which the sitter has been successively turned must be carefully noted, as this information is subsequently necessary in arranging the silhouettes together. A similar result is obviously obtainable by keeping the sitter stationary, and successively moving the whole of the apparatus around him through the whole circumference; or separate sources of light, separate screens, and separate cameras may be employed for each exposure; but, in all cases, each exposure should be numbered, and the angle between it and the previous exposure noted.

The hair, eyebrows, beard, and moustache should be powdered with flour or white powder before the exposures are made, particularly in the case of persons with dark hair.

Photographic copies or positives are taken from the negatives on thin sensitised sheets of metal, such as copper, the sensitised surface being formed upon an etching ground or varnish. The outlines of the silhouettes are traced through the etching ground with a needle or graving point, and are then etched through, thus separating the silhouette from the rest of the plate. The head-rest or ring which is photographed in each negative must be left upon each silhouette as a horizontal strip which becomes of service when the silhouettes are arranged together in the following operation.

This operation requires a suitable frame, which consists of a vertical cylindrical core and an upper and a lower horizontal ring. The core and rings have formed in them vertical radial slits at exactly the same angles as those at which the various negatives were originated in the photographic process. The silhouettes are arranged in this frame in their proper order, with the horizontal strips (*i.e.*, the photographs of the head-rest) which have been left on them fixed to the upper ring. The back edges of the silhouettes, which represent the vertical axis, are brought together at the axis of the core of the frame. Thus a radial skeleton outline is obtained, which represents the outline of the head and bust by means of a number of meridian-like lines formed by the front edges of the silhouettes, and this outline is in exact accordance with the reality. Between the silhouettes angular spaces are left which have now to be filled up.

The angular spaces which are left between the silhouettes are now filled in with modeller's clay, wax, or other plastic material, starting from the core or centre. By gradually filling it from the centre all round, the silhouettes become gradually fixed, so that the supporting rings may soon be cut away, leaving the modeller unhampered in his work.

For the face, which requires much greater care to secure the proper expression, the angles at which the successive negatives are taken should be much smaller than for the remainder of the work. The larger the number of silhouettes taken, the more easy will be the subsequent modelling and the more accurate the final result. An expert modeller will be required for the finishing touches.

The portrait bust thus modelled may be reproduced in the usual manner.

In the foregoing description reference has been made only to the production of portrait busts, but other objects may be similarly reproduced by the same means and in the same manner, and more particularly sculpture and similar works. The process is especially adapted for reproducing suitable works of art on a reduced or enlarged scale.

Claims: 1. The hereinbefore-described method of modelling by the aid of photography, substantially as and by the means set forth. 2. In the process of modelling by the aid of photography, taking a series of negatives from different points of the person or object to be modelled, the person or object being partly lighted and partly in deep shadow, and the camera being arranged in such case to take a sharp photograph of the line dividing the light from the shadow without foreshortening, substantially as hereinbefore described. 3. In the process of modelling by the aid of photography, producing silhouettes in sheet metal, or similar material, by photographic printing and etching from the negatives produced as described in the preceding clause, substantially as hereinbefore described. 4. In the process of modelling by the aid of photography, arranging the silhouettes produced as set forth in the preceding clauses radially around a central core, and filling up the space between them with suitable plastic material, substantially as hereinbefore described. 5. Silhouettes for modelling by the aid of photography, produced as hereinbefore described, and having a projection corresponding with the head-rest or ring, for the purpose of serving as an index or datum in arranging the silhouettes, substantially as hereinbefore described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
March 14	Darlington	Trevelyan Hotel, Darlington.
,, 14	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 14	Lantern Society	20, Hanover-square.
,, 14	Norfolk and Norwich	Bell Hotel, Norwich.
,, 14	North Middlesex	Jubilee Hall, Hornsey-road, N.
,, 15	Exeter	College Hall, South-street, Exeter.
,, 15	Keighley and District	Mechanics' Institute, North-street.
,, 15	North London	Wellington Hall, Islington, N.
,, 15	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 15	Southport	Shaftesbury-buildings, Eastbank-st.
,, 16	Brechin	14, St. Mary-street, Brechin.
,, 16	Bury	Temperance Hall, Bury.
,, 16	Hyde	
,, 16	Manchester Camera Club	Victoria Hotel, Manchester.
,, 16	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 16	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 16	Southsea	
,, 16	West Surrey	St. Mark's Schools, Battersea-rise.
,, 17	Birmingham	Lecture Room, Midland Institute.
,, 17	Camera Club	Charing-cross-road, W.C.
,, 17	Greenock	Museum Com. Room, Kelly-street.
,, 17	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 17	Oldham	The Lyceum, Union-st., Oldham.
,, 18	Cardiff	
,, 18	Holborn	
,, 18	Leamington	
,, 18	Maidstone	Trinity Church Room, Morton-st.
,, 19	Richmond	"The Palace," Maidstone.
		Greyhound Hotel, Richmond.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

March 8.—Ordinary Meeting, the President, Captain W. de W. Abney, F.R.S., in the chair.

The President announced that the Devon and Cornwall Camera Club, the Ealing Photographic Society, the Glasgow and West of Scotland Photographic Association, the Glasgow Photographic Society, and the Southsea Photographic Society had been admitted to affiliation of the Society.

The President also stated that Mr. F. P. Cembrano, jun., had been elected to fill the vacancy on the Council caused by the recent changes.

A paper on *Photography as Applied to the Detection of Crime* by Dr. Jaffarent, of Berlin, illustrated by a number of lantern photo-micrographs and other slides, was read by the Honorary Secretary. The author remarked that recent laboratory discoveries had developed corresponding evils, as the criminal had adapted them to his own ends, and thus certain kinds of crime had made considerable progress of late years. But, in the means for defeating those ends, photography by no means took the least place. The absolute accuracy with which scenes of crimes could be instantaneously photographed, as he had suggested, was a great assistance to the law. In one case, where there was a fight between a murderer and his victim, a clock had been displaced, and had stopped. In an examination of the scene, the officer did not notice the clock or the hour at which it had stopped. Had a photograph of it been taken it might have settled this and other matters. Cases occurred where the results of microscopical examinations had been doubted by the other side, but with decomposed blood, photo-micrographs could be used as positive evidence, and could be secured in an absolutely truthful manner. In detecting poison in the blood by such means, he had worked for many years. In the case of a murder he narrated how a photo-micrograph of a dog's hair, found on the body of the victim, had led to the conviction of the accused; for, from the appearance of the hair, it was judged to come from a yellow dog, which was a smooth-haired animal that had never had its hair clipped. A description of the dog was published, and suspicion fell upon an individual who possessed such a dog, hairs from which were proved to be identical with the dog's hair found on the body of the victim. The man was arrested, confessed the crime, and was executed. Another case was prepared from the hairs of the victim, a woman. On the clothes of two men suspected of the murder, a woman's hairs were found which coincided with those of the victim. The case was further strengthened by a trace of human blood on the clothes of one of the accused, who ultimately confessed to having done the deed alone. Human blood could be distinguished from animal blood by the difference in the sizes and shapes of the corpuscules by certain physical reactions, and its behaviour in polarised light. The corpuscules were disc-shaped, and could be accurately measured. A murderer had been convicted by photo-micrographs taken of a trace of blood left on an axe after it had been cleaned, having, the criminal said, been used to kill a goat. Photography, applied to the detection of the falsification of handwriting, showed that alterations and erasures could be clearly distinguished, and demonstrated the difference in the inks employed, which could not be perceived by the eye. Differently tinted inks had little effect on the eye, but, when photographed in a suitable light and on colour-sensitive plates, the difference became apparent. A number of slides were shown illustrating the inability of ordinary plates to penetrate alterations and erasures, which, with colour-sensitive plates, became plainly visible, altered figures and words being shown on various documents, the difference in the colour of the ink being readily detected by the colour-sensitive plates. In a court of law he superposed gelatine positives of an individual's characteristic writing upon the

forgery, thus proving to the judge the absolute truth of his method, which he claimed to be superior to other methods of identifying writing. Forged bills of exchange, postal orders, and legal documents, exposed in this way, were illustrated by several lantern slides. Blood taken from the body of a man who had met his death in a fire, when reproduced by photo-micrography, proved that the man was dead before the fire occurred.

Mr. ANDREW PRINOLE thought the author of the paper was, perhaps, a little too sure with regard to the possibility of differentiating the blood of mammalia from human blood. He considered it very difficult to make certain as to the difference between the various corpuscules. Of course, in the determination of a hair with the blood, the double evidence was much better.

The PRESIDENT said he once discovered a forgery by photography of the signature on an old engraving, as he was able to bring out the original signature. The engraving was supposed to be valuable, but turned out to be worthless with the new signature. He had done this in the same way as Dr. Jeserich.

A vote of thanks to Dr. Jeserich, and to Mr. Carl Gregor for having translated the paper, concluded the proceedings.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 3,—Mr. T. E. Freshwater, F.R.M.S., in the chair.

Mr. E. J. Wall was elected a member of the Association.

Mr. A. L. Henderson passed round a number of Dunmore's cloud negatives on ground glass.

Mr. J. Hay Taylor exhibited a binocular lanternescope of his own construction. It was stated that Messrs. G. Mason & Co., of Glasgow, were making such instruments.

Mr. Rawlings showed several photographs on wood. The wood was first coated with zinc white and albumen, and a film of plain collodion in which silver nitrate was suspended next applied to it. The picture was printed under a reversed negative in the usual way, the film being dissolved off with ether and alcohol. In answer to questions, Mr. RAWLINGS said the pictures were fixed in the ordinary way but not toned. Engravers found the surface excellent for cutting purposes.

A question, what functions do hydrochloric acid and nitric acid perform in emulsions, gelatine and collodion, was, after a lengthy discussion on gelatine emulsions, answered by reference to Abney's *Treatise on Photography*, in which it was stated that, if an emulsion is prepared with an excess of silver nitrate, it must be acid.

In the absence of Mr. S. Herbert Fry, who was to have demonstrated his new enlarging lantern, Mr. J. TRAILL TAYLOR, at extremely short notice, gave a discourse on *Enlarging Methods*. He said he knew nothing of the process or method of enlarging that was to have been brought before them that night, and he thought that a talk on enlarging generally and the means hitherto adopted might form a fitting introduction to a discussion on the subject. He would not however touch upon the surfaces to be enlarged upon, which might be collodion, wet or dry, gelatino-bromide, or other sensitive surfaces. Solar camera enlarging was little practised at present, thanks to the superior sensitiveness of printing surfaces, the only processes to which it was now applicable being carbon and platinum, no one thinking of printing enlargements on albumen paper. Rapidity depended upon the size of the condenser used, and sharpness was secured by an equatorial motion. Having described and figured the double condenser, by which the solar camera could be used with the electric or limelight, he said that a large volume of light could be obtained in that way, and, if the condensers were not very perfect, it was necessary to use a piece of ground glass to diffuse the light. He incidentally remarked that the limelight would probably be used more in future for enlarging purposes on account of the anticipated intense cheapening of oxygen, which, he believed, could now be made at a cost of 1*s.* 6*d.* per thousand feet, the process being the extraction of oxygen from air by permanganate of potash. He next referred to enlarging by means of radiated light from white surfaces by sun or artificial light, a piece of cardboard or the sky forming the white backing to a negative. By this arrangement no condenser was necessary, and it formed a very excellent method of producing enlargements. A modification of the lantern was made in New York, and sold under the name of the Wonder camera, and by Dancer in this country, as the Opaque Lantern many years ago. The late J. Solomon also made it, and he (Mr. Taylor) had one in his possession, which he described. It formed a pleasing way of projecting pictures or transparencies. He next described Mr. T. N. Armstrong's system, in which the negative intercepts the radiant, gas being used, as it gave greater facility than the electric or limelight or magnesium, and was cheaper. It was desirable to have two lamps instead of one, these being so placed and protected that no light fell on the surface of the negative.

Mr. A. CLARKE said this was exactly Mr. Herbert Fry's system.

Mr. TAYLOR said there was still another method which had been used and patented, consisting of illuminating the negative through ground glass, but by such a method only the centre of the negative was illuminated. It was said that equality of illumination could be obtained by increasing the number of surfaces of glass, but this was insufficient for equality. The system was bad if only one light be employed. The only way by which success could be had was by placing two other lights at the sides. A patent had been obtained for the substitution of opal for ground glass. This necessitated a fearful and wonderful exposure. Having contrasted glass coated with kaolin or baryta sulphate in gelatine with ground glass for placing between the radiant and the negative, Mr. Taylor concluded by describing the methods of daylight enlargement employed by some commercial houses, and said for the object glass there was nothing to excel the ordinary Petzval lens. Finally, he said that, in illuminating the negative through ground glass, equality might be obtained by igniting a strip of magnesium and waving it slightly to and fro.

Mr. E. MILNER described a rough-and-ready method of enlarging by means of a small and a large camera, the negative being placed at the screen of the small one, and illuminated by means of the light of magnesium reflected from a sheet of white cardboard.

Mr. W. E. DEBENHAM recommended the new Zeiss-Suter anastigmatic in preference to a portrait lens as the object glass for enlarging, the field of the former being so exceedingly flat.

The CHAIRMAN said two lights for illuminating opaque surfaces had been used considerably for lantern work, the lights being projected on an opaque object and thrown on the screen. Mr. S. Highley used to sell such a lantern. There was nothing novel in the idea.

Mr. A. HADDON suggested glass coated with plaster of Paris as a substitute for opal.

After considerable further discussion the meeting closed.

Camera Club.—March 3, Captain Abney in the chair.—A demonstration of *The Treatment of Prints by the Carbon Process* was given by the Autotype Company. Mr. SAWYER, in an address, gave a description of the process, and Messrs. Burton and Braham went through the necessary manipulations with a number of prints which had been prepared for the demonstration. A large number of fine illustrations was on exhibition in the room. On March 17, a lecture entitled, *Modern Masterpieces* (pictures and drawings shown in the lantern), will be delivered by Mr. Henry Blackburn, Editor of *Academy Notes*.

North London Photographic Society.—March 1, Mr. J. Traill Taylor in the chair.—A circular was laid before the Society from the Royal Commission for the Chicago Exhibition, and one from the Photographic Society of Great Britain inclosing the affiliation rules. Mr. JAMES MARTIN then read a paper on *Platinotype Printing*. This will appear in a future number. At the close a specimen print of some very beautiful ice crystals, presented by the lecturer to the Society, was passed round for examination. Next meeting March 16, lantern slide competition at 8.15 p.m.

Holborn Camera Club.—March 4, Mr. Binns in the chair.—A discussion on *Exposure* took place, and was eventually adjourned for further discussion until another evening. The third annual exhibition of the above Club will be held at Anderton's Hotel, Fleet-street, next Saturday (March 12).

People's Palace Photographic Club.—March 4, Mr. Thomas Lawday in the chair.—Mr. G. Kendall brought some stereographic negatives showing great flatness and want of vigour. Mr. Robert Beckett attributed this to poor light and unsuitable developer. It was stated that views in a dull or weak light should be developed with more pyro than is usual when the subject is brightly sun-lit. A 12×10 print on Fry's "Roughest" paper was exhibited by Mr. R. Edwards. This was uranium toned, and of a pleasing warm black colour. He stated that it experienced a difficulty in eliminating the yellowness left by the presence of ferricyanide in the toning solution, which clung to the rough pores of the paper.

Polytechnic Photographic Society.—March 4, Mr. J. H. Gear in the chair.—After Mr. T. Paternoster had shown and explained the various peculiarities of half a dozen patterns of flash lamps, the Chairman arranged two groups for experimental exposures. He asked the sitters to look at a bright light for some seconds so that the eyes might appear natural when the exposure was made. The lens used worked at *f*-6, and the plates being very rapid produced excellent negatives on development. March 18, *Wet Collodion*, by F. R. Tissington.

West London Photographic Society.—March 4, Technical Social Evening.—A pleasant informal gathering where various photographic matters were discussed with an absence of ceremony which was very acceptable to the majority of members present, and which enabled those gentlemen who, though talented, suffered from an excess of modesty to give the others present the benefit of their knowledge and experience, also those of the younger members who desired information on various matters, to obtain it in the course of friendly conversation. It is hoped that any gentleman who has anything the least interesting in a photographic way will bring it down to these meetings, and help to make them the success which the experience of the first evening seems to show will be achieved.

Chiswick Camera Club.—March 7.—A lecture on *The Hot Bath Platinotype Process* was given by Mr. R. W. WATSON, who said that, in his opinion, platinotype was unexcelled by any other printing process from an artistic point of view. Photographs were exhibited which showed the adaptability of platinotype to any style of photograph, interior photography being beautifully rendered by this process. The lecturer dwelt particularly upon the necessity of keeping platinum paper perfectly dry, both before and after printing.

Croydon Camera Club.—February 29, the President in the chair.—Messrs. Holland and Reeves presented the Club with framed examples of their work. Mr. Oakley showed the "Express" hand camera. Mr. CLARK read a short paper on *The Application of Air and Benzoline to the Production of an Incandescent Light suitable for the Lantern*, and by means of the aforesaid system projected a number of slides on to the screen. The illumination was by no means equal to limelight. It was decided to initiate a portfolio. Members are requested to bring over more mounted prints to the meeting on March 14, the best only to be selected for the portfolio. Extra meeting on March 11 to test Eastman's rapid bromide paper, Mr. White being the experimentalist. March 14, Mr. D. E. Goddard on *Silver Printing*. March 17, Annual Dinner at "Greyhound." March 28, Lantern Night.

Croydon Microscopical and Natural History Club (Photographic Section).—March 4, Mr. Edward Lovett (President) in the chair.—Mr. W. Low-Sarjeant exhibited an improved hand camera of his own construction. Mr. J. H. DRAGE then read a paper entitled *Pictorial Composition*. Mr. Drage hoped that, in reading this paper before the Club, the members would accept it more in the light of hints, and would give them a knowledge of the various lights, cast shadows, introduction of figures, and the general composition of pictures, balance of parts, and treatment of lines. Trimming prints was a thing photographers should be especially careful of, the horizontal lines being carefully noted, many pictures being spoilt by carelessness in this respect.

Lewes Photographic Society.—March 1, Mr. J. G. Braden in the chair.—A paper on *Kallitype Printing* was read by Mr. BEDFORD, and one of the members exhibited prints on the Eastman paper, distributed last month, which were much admired.

Midland Camera Club.—March 4, Dr. Hall Edwards in the chair.—Two new members were elected. Several members showed their prints upon the Eastman rapid bromide paper; Mrs. Welford, a negative just taken from a paper bag (when it had been two years), utterly spoiled by the paper; also a very neat leather camera case by Levy; Dr. Nichol, an enlargement from a quarter-plate on Ilford rapid paper. Dr. W. W. J. NICHOL then proceeded with his lecture and demonstration on his *Kallitype*. He traced the history of "iron" printing from 1840 up to his latest development of the "Kallitype" process, explaining how various colours were produced, concluding by developing several prints he had made that day. In response to questions from the President and members, Dr. Nichols stated that the "Kallitype" paper kept well, that it was more sensitive than silver paper, that it was cheap, and easy to use compared with bromide or platinotype. PROFESSOR ALLEN spoke most highly of "Kallitype" paper.

Nottinghamshire Amateur Photographic Association.—March 9.—The Rev. Beckton exhibited a set of slides taken by him in Switzerland. The pictures were supplemented by a description by Mr. Beckton, which greatly added to their interest.

Oxford Photographic Society.—March 17.—Mr. PAUL LANGE will give his *Norway* lecture in the new theatre in aid of the Radcliffe Infirmary Building Fund. The Rev. Dr. Bright, Master of University College, will take the chair. Mr. E. A. Ryman-Hall, and Mr. A. F. Stanley Kent, M.A., Magdalen College, will act as delegates of this Society on the "affiliation" scheme.

Rotherham Photographic Society.—March 1, Dr. Baldwin (President) in the chair.—A discussion on printing processes, as illustrated in the recent Exhibition, took place. It was pointed out that neither carbon nor the platinotype prints had been received from members, although there were some choice examples of both methods kindly lent by outsiders. The Question Box was also the means of an interchange of opinions on toning, washing, and mounting albumenised silver prints. For the benefit of new members it is intended to devote three or four extra nights to elementary subjects.

Sheffield Photographic Society.—March 1, Mr. Chesterman in the chair.—Some slides of hand-camera work caused a very warm and earnest discussion whether a good and artistic picture could be taken with the hand camera, and the uses and abuses of that class of camera.

Edinburgh Photographic Society.—March 2, Mr. H. J. Blanc (President) in the chair.—Mr. F. C. OLIPHANT read a paper on *Eastern Europe from a Photographic Point of View*, in which he detailed his experiences in south-eastern Russia. He mentioned that it was of little use, indeed dangerous, to photograph there without permission from the higher authorities, and that was a most difficult thing to obtain. For the guidance of future workers in that region, he stated that so-called detective cameras were of little use. He had found a compact hand camera to be best suited for the purpose. A report by the Special Committee appointed to look out for new premises for the Society was then submitted. It was to the effect that they had finally settled upon a house in 36, North Castle-street, fully detailed plans of which, prepared by Mr. Blanc, being exhibited, smaller scale plans of the same being also issued to each member with the billet calling the meeting. The first flat, after the necessary structural alterations have been made, shows a hall forty-two feet by sixteen feet, which will be ample accommodation for the monthly meetings, and which may also be used as library and reading room during the day. This might also be let to other societies for evening meetings. There are also on this flat another room, which may be used as lecturers' ante-rooms, committee-room, writing room, for members' use, as well as a kitchen and other conveniences. The second floor has a room with oriel window, which it is proposed to make into a dark room with good accommodation for workers for changing plates or arrangement, and a larger one which may be used as a smoking-room, as well as a much larger one, and another which, if not needed for the work of the Society, could be let to a suitable tenant. The attic flat it is proposed to appropriate as a dwelling for the caretaker. The Committee's report goes on to state the advantages to members not having home accommodation, and other matters, such as the cost and prospects of return. The cost of original purchase and alterations are estimated at slightly over 1000*l*. The ready money necessary has been raised by 50 debentures, held by members, no one holding more than three, the Society retaining the right to buy these up from time to time as its funds will admit. There is also a proposal before the Society for the formation of a lantern club, to be restricted to its members, for the discussion of questions relating to optical projection, the making and exchange of slides and similar matters. The contributions to the Maddox Fund at the last popular meeting amounted to 5*l*.

Glasgow Photographic Association.—February 25, Mr. William Lang, jun., F.C.S. (President), in the chair.—The lecturer for the evening was Mr. A. Lawrence Mitton, who showed a large series of transparencies to illustrate his subject, *A Chat about Modern Painters*, which was treated in an instructive and interesting manner. Slides were shown from the works of Wilkie, Turner, Landseer, Maclise, Tadema, Leighton, Meissonier, Millet, &c. March 3, Three new members were elected, viz., Messrs. G. C. Gibson, John Annan, and Rev. A. W. Russell, M.A. Mr. JOHN ANNAN read a paper on *The Position of Photography in relation to Beauty and Utility*. The reading of the paper was followed by an animated discussion. One of Mr. Dallmeyer's new Telephotographic lenses mounted in aluminium, and a new hand camera, the "Flying Scud," with a novel folding arrangement, were shown. A series of transparencies by Mr. Lynch's Ives-Hay collodio-bromide plates was passed through Mr. Sweaty's lantern.

Dundee and East of Scotland Photographic Association.—March 3, Mr. J. D. Gibson (President) in the chair.—A lantern slide competition among the members of the Society was entered upon. Eleven competitors took part in it, each of whom exhibited a set of six slides. With one or two exceptions the views were of an exceptionally high standard. The results were declared as follows:—1, Mr. J. D. Gibson; 2, Mr. J. R. Stewart; 3, Mr. V. C. Baird. The latter half of the evening was taken up with the exhibition of a large number of slides illustrating the uses of a hand camera, which had been lent to the Association by Mr. A. R. Dresser, of London. The set included some fine sea subjects, taken chiefly on the south coast of England, and also some very pretty street views in Brittany and Holland.

The Photographic Society of Philadelphia.—February 10, the President, Mr. John G. Bullock, in the chair.—Dr. ELLERSLIE WALLACE read a paper on *The Fading of Silver Prints*. Dr. MITCHELL took exception to the reader's statement in regard to gelatine as a mountant. He was not quite so ready to ascribe the fading of silver prints to this source. It seemed to him that if gelatine possessed this property it would affect the integrity of every emulsion that was made, not only for negative plates, but also the different forms of gelatine emulsions now prepared for aristotypes. If the mount was made with a common grade of gelatines there might be injurious chemical substances in it, because it was well known that acid was used as a necessary adjunct in its preparation; but he very much doubted whether good gelatine would have the effect ascribed to it by Dr. Wallace. Another probable cause for the fading of prints was that they were not fixed long enough. It was much more important than washing. It was a very common habit to take a negative out of the fixing bath as soon as the colour disappeared, thinking that it was fixed, but this was a wrong impression. It should either be allowed to remain five or ten minutes longer in the hypo, or be entirely transferred to a fresh fixing bath. He fully believed a good deal of the trouble in regard to the permanency of silver prints was due to insufficient fixing. He would add, in conclusion, that he agreed with Dr. Wallace in regard to the injurious effect of extensive washing. It tended to destroy the character of the image, and also probably affected the permanency of the photograph. Mr. CARBUTT stated that during the Centennial he had quite a number of Irish views, the majority of which he mounted on thin glass plates with gelatine. It struck him that possibly the gelatine might absorb moisture, so he varnished the plates with collodion. When he last saw them they were unchanged. He had pictures, purchased in Paris in 1862, which, when last seen, bore no traces of fading. Some of his own make, made in Chicago in 1862 or 1863, were just as fresh now as the day they were made—made, too, in the ordinary routine of gallery work, using carefully the best materials to be had. Dr. WALLACE asked whether the gelatine contained any glycerine. In the experiment he referred to the gelatine contained a proportion of glycerine. Mr. CARBUTT said he used no glycerine, only a plain solution of Nelson's gelatine. Mr. C. W. MILLER called the attention of the members to Mr. A. L. Henderson's communication in the *Bulletin* of the French Society, wherein he stated that it was impossible to make a good emulsion with nitrate of silver and gelatine *prepared together*. During the process the nitrate of silver and gelatine should never be allowed to come together, otherwise green and red fog would inevitably ensue. This does not refer to boiled emulsion, but digestion in twenty-four hours. Mr. CARBUTT said he had had a little experience in making emulsions, and did not agree with Mr. Henderson's views. He had tried his method, and found it impossible to make a rapid emulsion with it. A good emulsion could be made with the nitrate of silver in contact with gelatine, and he had accomplished it in that way. Mr. J. F. SACHSE, as announced, exhibited specimens of work done with the new photo-tele-objective of Dr. Adolph Miethe, of Berlin, and read an explanatory paper in connexion therewith. Mr. CHEYNEY stated that he did not see how it differed from the regular Galilean telescope, and that there seemed to be a strange coincidence in the fact that Mr. Knipe, of Queen & Co., had been using this very identical thing for the purpose of having a variable focus for lantern objectives. It had also been used in the microscope as an amplifier. He did not see that there was anything new about it, except to apply it to photographic purposes. Mr. LUDEKE exhibited a model he had made of Dr. Miethe's combination, together with a print from a negative made with it, showing the tower of the City Hall, taken from Washington Avenue, over a mile distant. The lens used for the positive was a six-inch portrait lens, and the concave was only two inches—in fact, was from an ordinary opera glass. The result was very satisfactory, and a practical illustration on the ground glass, using a gas jet and bracket as a focal point, was of great interest to all the members present, the camera exhibiting two pictures, one with the ordinary lens, and the other with the new combination lenses. The difference was very apparent.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

RATIO OF GRADATION.

To the EDITOR.

SIR,—In the article on the Hurter & Driffield investigations which appeared in last week's BRITISH JOURNAL OF PHOTOGRAPHY, Mr. Bolton mentioned a point of the greatest importance in theoretical questions which does not yet appear to have been satisfactorily settled. The true relation between the amount of reduced silver in any part of a negative, and the opacity produced by it, is still, to some extent, uncertain. Messrs. Hurter & Driffield, in the original paper on *Photo-chemical Investigations*, explain their view of the matter in this manner:—If we have a number of films of equal density, each of which transmits a certain fraction of the light it is exposed to, say, $\frac{1}{2}$, then, if any number of such films are superposed, as each will transmit $\frac{1}{2}$ of the light it receives, the total result, when there are n such films, will be that the amount of light which passes through all will be $(\frac{1}{2})^n$ of the original intensity, so that n, the number of films, is also the logarithm of the transparency to

the base $\frac{1}{2}$, or, multiplied by the proper modulus, to any other base.* The ratios of the logarithms of transparencies are thus shown to correspond to the number of superposed films, each of which contains the same quantity of reduced silver; and it follows, therefore, that they are proportional to the amount of silver per unit area; but the *total thickness* of film in this case *varies*, and in the same proportion as the different values of n. It has not been proved that the same law applies when, as in a photographic plate, the thickness of film is always the same, and the silver, whether much or little, always contained in the same space. Messrs. Hurter & Driffield merely write: "The reduction of the intensity is, of course, due to the black particles, and depends simply upon the number of them which are interposed per unit of area." But that does not appear to be so entirely a matter of course as is here implied; the positions of the particles of silver may have to be taken into consideration. Carried to the absurd, we should expect to find, on these principles, that a sheet of perforated zinc transmitted no more light than a thinner unbroken piece of the same metal, if of equal size and the same weight, as the number of molecules of zinc per unit of area of each piece would be identical. Messrs. Hurter & Driffield's principles will, no doubt, be found correct when the thickness of film is large compared with the size of the grains of silver; but it must be remembered that, in most rapid plates, the grains are of appreciable size. If we take an extreme case, and suppose a film of only the same thickness as the diameter of one grain, it is evident that there could then be no overlapping, so that every grain would obstruct the same amount of light, and the opacity (using the expression, however, in a different sense to that adopted by Messrs. Hurter & Driffield) would be proportional to the quantity of silver present. The transparency to one unit of light would be $1-a$, a representing the amount of light obstructed, and being always proportional to the amount of silver.

Mr. Plener, in one of an unfinished series of articles on subjects of this nature (rather marred by confusion of arithmetical and geometrical progressions) in the *Photographic News* of 1882, when considering the principles involved in the preparation of sensitometer screens, gave a formula based on the above which, with some modification, may be applied to the case of photographic plates. Simplifying his method a little, the film may be considered as consisting of n imaginary layers, each of the thickness of one of the grains of silver, and each passing $1-a$ of the light received. The transparency of the actual film will then be a fraction equal to $(1-a)^n$ (this is supposing the grains to be all of equal size and evenly distributed), a varying in the same proportion as the total amount of silver present. Messrs. Hurter & Driffield's principles might be represented by the same formula, treating n as the variable quantity. In either case n would represent the thickness of film; but if we take a transparency of $(1-a)^n$ as a standard, the effect of doubling the amount of silver, for example, would by one system give $(1-2a)^n$, and by the other $(1-a)^{2n}$. Now, when n is very large, the values of these two formula will be practically identical, and, remembering that $n=\frac{\text{thickness of film}}{\text{diameter of grain}}$, it appears to have been large in all the experiments by which Messrs. Hurter & Driffield tested the corrected of their views. For the experiment with Indian ink, a cell was employed, the width of which was probably many times greater than the thickness of a dry gelatine film; and in all their more important experimental work they used Chapman's *slow* plates, in which the silver would no doubt be in a very finely divided state, and these plates were specially prepared, "every care being taken to secure a *thick* and even film." Captain Abney, in 1889, performed some experiments in this direction, and I find his results in a trial with Indian ink in no way support Messrs. Hurter & Driffield's views; while an experiment with dried gelatine films containing known quantities of silver certainly agrees fairly well with them in the middle numbers, but is quite out at both ends of the series.

Dr. Eder gives ·003 mm. as the diameter of the grains of Ag Br in rapid emulsion, and the average thickness of film in a gelatine plate may, perhaps, be taken as about ·03 mm. These are not extreme figures, and many instantaneous plates probably have coarser grains contained in much thinner films; but, if we use these estimates, we have a ratio of 1:10, so that $n=10$ and that value of n will lead to very different results if the formula derived from Mr. Plener's article be followed to those which would be shown by that of Messrs. Hurter & Driffield. If we start with such a proportion of silver that one-tenth the thickness of film would obstruct ·01 of the light, then the total transparency would be $\cdot 99^{10}$—·9044; and, taking that as representing the effect of one unit of silver by either formula, the accompanying table will show the results of increasing the amount:—

Amount of Silver.	Transparencies.	
	Plener.	Hurter & Driffield.
1	·9044	·9044
10	·3487	·3660
20	·1074	·1340
40	·0061	·0179
50	·00098	·00658

It will be seen that increasing the silver ten times—which gives a transparency of about $\frac{1}{3}$—has produced but little difference between the columns, but they then gradually disagree, till in the great densities given by fifty times the silver, if the first column is correct, the other shows more than six times too great transparency. Eighty units of silver would show a difference of three thousand times, but the densities would then be far beyond anything we have to consider in photography.

The formula I have described appears to be more probably correct than that of Messrs. Hurter & Driffield, but still there are several reasons why it is not altogether to be depended on. I have treated the grains of silver as being all of the same size and equally distributed through the film, but these conditions are, of course, not really fulfilled. In all emulsions the fineness of grain varies considerably (the more the better), and finely divided matter gives much greater opacity than an equal quantity in a coarser state. Then the bromide of silver always settles down more or less in coating the plate, especially in the case of rapid emulsions. The coarser and more sensitive grains sink to the bottom, while the finer, remaining on the surface, will be the first attacked both by light and by the developer. The thickness of the film, too, varies after development, the more transparent parts being depressed. All these matters lead to much uncertainty in any attempt to find a formula which may be depended on. So far as they result in greater concentration of the deposit, the result would be similar to taking a smaller value for n, but the whole is so doubtful that there seems little hope of finding a really correct formula by which the amount of silver may be calculated from the transparency, or *vice versâ*, especially in rapid plates. Experiments may perhaps lead to the discovery of a satisfactory empirical formula, and, in fact, that of Captain Abney agrees very closely with observed results except in the higher densities.

Messrs. Hurter & Driffield's method is, no doubt, practically right in regard to very slow plates, and their "correct formula," which depends upon the truth of it, is, at any rate, in that case probably quite trustworthy. Even if its application must be limited to the case of slow plates, this "correct formula" may be of much value in future investigations, and probably in many scientific uses of photography.—I am, yours, &c.,

H. J. Channon.

Woodlands, Lewisham, S.E., March 7, 1892.

* *Opacity*, as defined by Messrs. Hurter & Driffield, is merely the reciprocal of *transparency*, and represented by changing the signs of the logarithms, which would otherwise be negatived by the ordinary tables.

SOCIETY FOR KENSINGTON AND BAYSWATER.

To the Editor.

Sir,—Owing to the West London Photographic Society having moved its headquarters from Hammersmith to Chiswick, the large district comprising Bayswater, Hammersmith, Kensington, and Notting Hill is now left without a society. Within this large area it is thought there are many photographers, both amateur and professional, who would benefit by a society being formed in their midst, so a few gentlemen interested in the subject met last week, and resolved to call a meeting for that purpose. It will be held at the Horbury Rooms, Kensington Park-road (close to Notting Hill-gate station, on the Metropolitan Railway), on Monday, the 21st inst., at 8.30 p.m., and all gentlemen interested in the matter are invited to attend. Those unable to attend, but willing to join in the movement, are requested to send in their names to me before the date of the meeting.—I am, yours, &c.,

Charles W. Brumwell,
Secretary pro tem.

7, *Lower-terrace, Notting Hill, W.*

LOSS OF DENSITY IN FIXING.

To the Editor.

Sir,—Please allow me a few words more on "loss of density in fixing." You say at the end of your notice, p. 130, that the so-called loss of density in the fixing bath is due to under-development or under-exposure. Exactly what I said—under-development principally, however. Now, ask the manufacturers to say on labels that their plates should be developed rather more or less than others, or something to that effect, and all will be right.

When I said it would be better for the professional or amateur wanting to make a trial of the plates, and in the end to the manufacturer, I meant to prevent the discouragement to the amateur and if you want the renewal of a trial to the professional. The first one may give that brand of plates up at once, as not sensitive enough; and the second one (professional), if more conscientious, may try more exposures and increased density in development, or may give up without further trials.

I may be mistaken in the origin of the reason why, but here is one of my experiences, repeated several times. I took a negative with rapid exposure, and developed it fully, and even more than I usually do, judging by transparency and by the back of negative; and, after fixing, the negative was not fit to print from, being too thin.

Allow me to tell you my way of judging when a negative is fully developed, and perhaps you will see that the iodide of silver or the thickness of the film play a lesser part in the judgment, at least with me, as to when I should stop the development or go further, than you may think. When I put the plate in the developer I watch the image, first as it comes on the face of the plate, and then by transparency, until it gets the intensity it should have when finished; then I watch it from the back by the colour it gets (not the image, which I cannot see by reflected light, of course). From first white it turns slightly grey, and, as this colour

deepens, I consider the negative well done when this grey is pretty dark; say, about the colour of bright old silver. Then I stop, and wash and fix, and the result is, about ninety-nine times out of a hundred, good.

This for my regular brand of plates, W. & W.'s. Some other plates may work the same, but certainly some do not; and, to get a good printing negative, I have to watch the back, on some of those, get to a much darker grey, edging on black; and, as to transparency, not be able to know what is on the plate. However, result: a very good negative to print from.

Loss in hypo. or what? Development has certainly to be carried on further than with other plates. If the manufacturer can let us know about it beforehand, some trouble can be saved, and probably some more trade to some of them.—I am, yours, &c., A. LEVY.

4, *Avenue Pinel, Asnières (Seine), February* 29, 1892.

MR. COLES AND MR. HOWSON.

To the EDITOR.

SIR,—As Mr. Howson refrained last week from mentioning any evidence in support of the accusation made against me of misrepresenting him, I can only assume none to be forthcoming and the charge to be considered as withdrawn.—I am, yours, &c., WILLIAM COLES.

Watford, March 7, 1892.

THE TRUE POSITION OF THE PHOTOGRAPHER IN THE ART WORLD.

To the EDITOR.

SIR,—I see that my letter of January 8 did not altogether convey the impression to the minds of some of your readers that I expected or intended, and, if I might be allowed to further introduce myself, no doubt they will become better acquainted with me. My connexion and association with photography, extending over a period of nearly twenty years, entitles me, perhaps, to as much recognition in your columns as the majority of your readers; nevertheless, my experience as an artist constitutes me a decided outsider, as far as some of the sentiments expressed therein are concerned.

Perhaps it is due to my training as an artist that I have been led in my own mind to make so pronounced a distinction between the word Artist and the word Photographer that I took it for granted the two would not in any way become confounded. In this I am perhaps to blame, as it is now evident that a wide and varied construction is put on the word Artist among your readers. In justice to that portion of your readers I represent, I feel bound to give my own definition of it. I must admit I find some difficulty in approaching this subject without leaving myself open to misconstruction and giving offence where least intended, and, did I not feel confident that I should meet with the support of higher intelligence among your readers than my own, I should not feel competent to come forward.

Before going further, I might point out that my letter was in the main a protest against a one-sided controversy, in which the artist was not up to them represented, and only appeared to be recognised as an opposing party, and that I made little or no attempt at argument under the heading you kindly supplied; and, while claiming to be recognised as a supporter of the interests of science and art, I most respectfully decline to participate in any contention that appears to me unworthy of the name.

Vague as the word Artist may appear to be to some, I have always regarded it as belonging to that school whose course of training is laid down on the same lines as those adopted by the so-called artist-painter, whatever branch may be ultimately intended; whether it be sculpture, painting, engraving, designing, &c., it must necessarily be of a creative nature.

An artist may take up photography and become an artist in photography (in connexion with it), but cannot obtain that position without first proving himself an artist outside of it, and altogether independent of it, for the simple reason, and it is an admitted fact, that by resorting to mechanical means he is digressing from the principles upon which he became an artist; hence all the more reason for efficiency beforehand, and under which circumstances he must revert as often as possible to the training he commenced with to keep him up to his standard merit and prevent retrogression. It cannot be denied there is good scope for the exercise of artistic intelligence in connexion with photography; nevertheless, its advantages must be realised to be properly appreciated. I cannot admit of any person becoming an artist on his own assumption—there must be some tangible proof of qualification; otherwise, where indeed must the line be drawn? I maintain that the trained artist is the fit and proper person to carry out the work of the scientist in photography, and so supply what the intelligent patron will demand, the combination of science and art.

The scientist does not claim perfection in photography from an artistic point of view, nor does the artist take credit to himself for the scientific part—only for what he is able to supply. We all take up photography more or less on sufferance, and we have no right to abuse our privileges. What I strongly condemn and refuse to participate in are the insults that are piled upon the artist who prefers to dispense with all mechanical means in bringing about his desired result.

What must our esteemed brother artists in other capacities think of the intelligence or sincerity of a man claiming to be an artist, who will compare the mere brushes and palette of an artist with the camera and lens of a photographer, and place them on an equality as regards the part they play in the production of the work? I would ask such, are they under the impression that brushes can be bought guaranteed to paint, or form pictures of given dimensions, the same as they can buy lenses, and do they suppose that brushes and palette can be so set together that an artist can go away and leave them doing the work, come back and apply a liquid to his canvas, and find the picture complete, and not always be sure, unless he has correctly numbered his canvas, what the subject of his picture was going to be, or which was the right end up?

To designate a man 'a wielder of the brush' is to imply that he uses the brush mechanically, as he might do in painting a house, &c. The use of the brush does not make a man an artist any more than the use of the camera and lens will ever make a photographer one. If there is nothing in a name, why are photographers so anxious to prove their claim to the title of artist, and why take trouble to analyse the word, and show that it means nothing in particular? Or why investigate ancient history to show that artists were thought nothing of before the world was barely civilised or educated? And is it not as mean as it is ridiculous to compare a photograph with a water-colour drawing? If the photograph was the best specimen ever produced, and the water-colour drawing the worst, the one is still a mechanical production, and the other a work of art. The photographer will take credit where he is not entitled to it, or where his intelligence is not in any way responsible; the actual creation of the desired object is the work of nature.

A photograph may be compared to a plant; the dry plates are like the virgin soil, the ground has been prepared, the exposure is given, the seed is set, the latent image is there, it is watered, it is nourished, the developer is applied; now notice how the cold weather retards its growth, notice how the sunshine accelerates its development, soon a plant in full bloom appears on the surface.

But suppose you have a friend who has made, by his own hand, a beautiful imitation in wax of the same kind of plant, and he shows it to you, would you have the impertinence to tell him you had made one "that would beat that into a cocked hat," and rush off and fetch the one you had grown in your garden? Does this illustration not give you some notion of the meaning of the word Art?

If the photographer cannot claim to have contributed something towards the advancement of the science of photography, beyond amusing himself with it, or living on it as though it were specially designed for his benefit, and if he refuses to qualify himself as an artist, then he is nothing more than a mechanical photographic practitioner; and, if I am asked the question, I should say, these are the men who have benefited most by photography, and hang on to the name of science and art for protection, while they insult people who have earned a superior position.—I am, yours, &c.,

ARTIST WITH BRUSH, PENCIL, AND CAMERA.

45 *Wynford Street, Eccles New Road, Manchester.*

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Wanted, 7½×5 or larger camera complete. Exchange *Gazettes of the World* (Fullarton's), thirty-two parts, complete, uncut. Address, ROBERT MCCONCHIE, Kirkcudbright.

Pair of backgrounds in flatted oils, on linen, 8 ft.×7 ft. 6 in. Exchange for good violin. Photographs forwarded. Address, W. HARE, Windsor Studio, Sutton, Surrey.

Will exchange three-quarter-plate rapid portrait lens by Spicer Brothers for half-plate rapid rectilinear or Euryscope lens by a good maker.—Address, P. PILCHER, Photographer, Dover.

I will exchange Cassell's *Technical Educator*, clean and perfect, for half-plate combination rectigraph lens, or Booth's mitre-cutting machine. Address, M., 3, Nightingale-terrace, Sutton, Surrey.

Forty-one numbers of the *Photographic World*, commencing with No. 4, for the *Ilford Manual and Robinson's Picture Making by Photography*.—Address, H. O. THOMPSON, 45, Gloucester-road, Newcastle-on-Tyne.

Seven years' BRITISH JOURNAL OF PHOTOGRAPHY, Ross's 10×8 doublet, ditto whole-plate doublet, backgrounds, Seaves's, rustic bridge, half-plate portrait lens, strong tripod stand; wanted, 12×10 landscape camera, with double slides, also changing-back chair.—Address, W. HASSETT, Stoke-road, Guildford.

Will exchange a very light half-plate camera, three double slides, rapid rectilinear lens, Thornton-Pickard shutter, stand, whole weighing under nine pounds, nearly new, cost 8*l.* 15*s.*; also a quarter-plate Lancaster's International, three double metal slides, lens, shutter, stand, and case, complete, cost altogether 3*l.* 15*s.*, with an extra double slide and screen, for a Ross's Cabinet portrait lens.—Address, MAFIN, The Avenue, St. Margaret's, Twickenham.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

W. M. Ashman, Bath.—*Two portraits of the Rev. Francis Edward Murphy.*

HENRY HILL.—437½ grains.

E. MARTIN.—From the description given, we should think the article would answer well.

A. J. STATHAM (King's College).—It is a fine specimen of the ordinary Talbotype negative taken in the camera.

C. W. GASKELL.—The image is formed of metallic silver. It is probably as permanent as any other process.

M. B.—We are unacquainted with the first firm yon name, and of the other we know nothing to their disadvantage.

H. MOREL.—Messrs. Tunny of Edinburgh, Martin of New Southgate, Watson of Hull, and others, undertake ceramic work.

SINED.—So far as we are aware, Mr. J. J. Atkinson, of Liverpool, is the sole agent for Seavey's backgrounds in this country.

DOUBTFUL.—1. *F*-12 to *f*-15. 2. As far from the lens as will permit the corners to be touched. 3. Yes. 4. You must ascertain by experiment.

P. NOLAN.—For copying engravings, extra rapid plates are of no advantage—quite the reverse. For this work use slow plates, so as to obtain vigour, with clear lines. Plates specially made for copying are the best for the purpose.

T. MATHIAS asks: "Will you kindly tell me if there is anything that I can darken my goat-skin rug with? It comes out too white in the photograph."—Try the effect of immersing the rug in a dilute solution of bichromate of potash, and dry in the sun.

E. C. W.—Methylated spirit of the "old sort" can still be obtained for manufacturing purposes, but only in wholesale quantities, and then by giving a heavy bond to the Excise authorities that it will only be used for such purposes. As you say, the thing is a nuisance.

W. DAVIS.—1. Settle upon the lantern that has the right inch condenser, and use the cabinet portrait lens for enlarging with. 2. The wide-angle single lens is not suitable for architectural subjects, though it is excellent for landscapes when a wide angle has to be embraced.

GEO. HENRY RUTTER.—1. We believe that the object of the solution is simply to "desensitise" the unaltered bromide, and thus no alteration in its appearance would take place. 2. Obviously, so soon as it fails to produce the foregoing effect. 3. Quite feasible, we should think.

G. F. F.—The various proportions of the constituents of the solution could only be determined by the volumetric method. As you confess your total ignorance of that system, we fear that a description of it, besides occupying far more space than we could spare, would not be intelligible to you. Better consult some work on volumetric analysis. The impurities from the bath may be removed by kaolin.

ECHO.—The "figures on the stops" indicate that the aperture of the diaphragm is a given fraction of the focal length of the lens. Such a lens would certainly "be useful for views." You had better study the elements of photographic optics, as you appear to be ignorant of the use of stops and the various forms of lenses. To our knowledge, there is no law prohibiting you from taking views of London on Sunday.

W. TATE says "he has a large copying camera, made many years ago, with a mackintosh cloth bellows, and now the folds, when pressed together for a short time, stick. They did not do this until quite recently. He wishes to know the cause and the remedy?"—The cause is that the rubber is becoming perished, which it is liable to do with age. The sticking may be prevented, in a great measure, by frequently rubbing the folds over with French chalk.

W. R. L. is desirous of forming an amateur society in his district, and asks how to proceed, and what is the usual subscription?—The usual way is to call a preliminary meeting of those in favour of the scheme, and at that draw out and frame rules; then call a general meeting, and submit them for confirmation or alteration, and appoint officers. The subscription to different societies varies from five shillings a year upwards. About half a guinea is the general sum.

A. R. J. asks "if he sends some negatives by rail and they get broken in transit, and they are insured for a certain amount, can he recover that amount in full?"—Yes, certainly, provided he can show that the negatives were of the actual value for which they were insured. He can only recover the real value of them, whatever that may be, and not any fancy sum for which they may have been insured. It has been decided, in a case for compensation, that the value of negatives that were broken was little more than that of the glass and the materials upon it. That was some years ago.

A. P. would be glad to know if there is anything beside brown glue suitable for sticking the backs on to opalines, as he finds it is liable to discolour the photo where it touches; also, if put in a sunny window, the backs frequently come off. As A. P. has a large quantity of opalines to make, he would be obliged by any suggestions.—Any adhesive that will stick the backs on will answer the purpose as well as brown glue. If this discolours the picture, a pale gelatine might be employed. Possibly the glue was applied too thick, and that was the cause of its becoming detached. As we have said before, anything may be used.

T. M. BRAUND and others.—Received, with thanks.

C. WARD.—1. The difficulties you find in working the carbon process may possibly be accounted for by a careful perusal of an article on another page. 2. It is quite a mistake on your part to imagine that gelatine negatives are not suitable for producing good prints from the carbon process. 3. What is sold as transfer collodion will answer for coating the glass with, but it should be thinned down a little with ether and alcohol; methylated, if strong, will do. 4. If the coating of the flexible temporary support comes away with the print, it shows one of two things—either it was not sufficiently waxed, or too hot water was used for developing.

S. A. E. writes he has tried all the processes for making half-tone process blocks that have been published, and finds that none of them will give good results. He adds that he believes what has been published is misleading. We disagree entirely with our correspondent on the last remark, because it is not correct as to several methods described in our back volumes. The mere reading of the details of any process, and working by any particular formula, will not give the practical experience always necessary to produce good results. A business, and a somewhat intricate one, too, cannot be learnt without a prolonged experience. Some of those who are most proficient with this class of work have spent years in acquiring their skill and experience. With process blocks, as with every other branch of industry, there is much to be learnt before uniformly perfect results are obtained.

D. DIXON writes: "I often see recommended as a mounting solution one of gelatine, water, and methylated spirit. I have tried making it several times, but always failed, although I have kept strictly to the formula and used the strongest gelatine I could get—Coignet's Gold Medal, to wit. My difficulty is this. As soon as I add the spirit, a hard coagulated mass separates, and leaves the solvents clear, and no amount of heat and stirring will make them combine. Can you enlighten me?"—The reason is that the spirit has caused a precipitation of the gelatine, and our correspondent has used about the most unsuitable kind for the purpose. To make a solution of gelatine containing a large proportion of spirit, a very soluble kind should be employed, such as, say, Nelson's "No. 2 soluble." With this a tolerably large quantity may be introduced without precipitation. The stronger and more insoluble the gelatine, the less the spirit that can be used without causing precipitation. With some of the commoner qualities of glue a solution may be made with nearly all spirit.

RECEIVED.—Several catalogues. These in our next.

THE PHOTOGRAPHIC CLUB.—March 16, *Shutters*, by Mr. A. S. Newman. 23, Last Lantern Night of the season. 30, Smoking Concert.

THE Council of the National Association of Professional Photographers requests that all photographers not yet enrolled as members will at once send their names and addresses for publication with the annual report and balance-sheet, about to be printed and circulated.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—March 17, Monthly Lantern Night. March 24, *Continental Photographic Institutions and their Influence*, Mr. W. H. Harrison. Mr. Warnerke will take the chair, and exhibit his lantern slides bearing on the subject. March 31, *A Short Demonstration of Photography on Wood*, Mr. W. S. Rawlings.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Committees for the following objects, among others, have recently been appointed by the Council to consider whether any, and, if any, what explanatory additions should be appended to the report of the Committee of Standards of 1881, and to report upon the question of standards in subjects not dealt with by that Committee; to deal with all matters connected with the Museum; to consider the question of the recent Excise regulations relating to methylated spirit; and to consider the whole question of the Exhibition, and to report thereon to the Council.

"THE GREAT EARTHQUAKE IN JAPAN, 1891."—The work by Professors Milne and Burton on the terrible earthquake of last October is now in the hands of the public. It is printed in luxurious type, on paper of the finest quality, and illustrated by no less than twenty-nine large plates. Two months sufficed to collect materials for, illustrate, put into type, and bind it. Professor Milne's letterpress occupies ten pages. Into that short space he has compressed a great mass of information about earthquakes in general, and the Ai-Gi catastrophe in particular. With regard to the plates in the volume, they are photographs taken for the most part by Professor Burton, and reproduced by Mr. Ogawa. The scenes chosen convey a vivid idea of the great calamity and all its concomitant features. Accompanying each picture is a short description, which conveys all the information required for a full understanding of the scene.

*** *We have many articles and papers in type which we are obliged to hold over until the great pressure on our columns is relaxed. Several of our contributors and the secretaries of many societies will therefore understand from this the delay in the appearance of their communications.*

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1663. Vol. XXXIX.—MARCH 18, 1892.

SPOTS ON ALBUMENISED PAPER PRINTS.

As our correspondence testifies, the complaints of spots on prints have become so unusually frequent that some discussion upon the subject may be of advantage. There is no doubt their occurrence can be traced to both general and local causes, some of the latter being particular instances of the former. First and foremost must be placed atmospheric phenomena, which, during the winter season, are provocative of so many evils, not the least being the tendency to induce the production of spots which, under ordinary or more general states of the weather, would not be seen. Albumenised paper, sensitised in the ordinary manner, is hygrometric to a very pronounced degree, and, the humidity of the air at this time of the year being at its maximum, the sensitised paper, though at the outset made perfectly dry, rapidly absorbs so much water that the slightest amount of foreign organic matter suffices to initiate reduction of the free surface nitrate, and so engender spots. This hygrometric condition is intensified by the fact of most albumenised paper being chlorised with ammonium compounds, with the result that the silver bath quickly becomes largely charged with nitrate of ammonia, a very deliquescent salt. Those who have found their prints suffer from an abnormal quantity of spots have noticed how, when they happen to have made a new floating bath, the spots for a time have diminished in frequency; there can be little doubt that this is owing to the absence of this deliquescent compound during the youth of the solution. If any one wish to ascertain whether his albumenised paper is prepared with chloride of ammonium, he need only drop upon the glossy surface a little solution of caustic soda or potassa, or of lime-water, and hold over the place a piece of red litmus paper, which will at once turn blue by the action of the ammonia thus liberated. It may easily happen that the ammonia can be detected by the sense of smell alone.

With these considerations before us, it is evident that the careful storage of paper before being placed in the printing frame will prevent the absorption of moisture. Similarly the periodical drying of the pads, decidedly advantageous for other reasons, will here also be beneficial. We may remark that the opposite extreme, the making the paper "bone dry" just before placing upon the negative will be the reverse of beneficial, as it is a well-established fact that over-dry paper will neither print nor tone satisfactorily. What is required is to prevent its arriving at the opposite extreme.

It is often felt necessary during dull weather, in the endeavour to utilise all available light, to print in the open air. *En passant*, we may say we consider this practice not to be so advantageous as is often supposed, for it must be a very defective covering that robs the light of even ten per cent. of its actinism. The result must naturally be the dropping down upon the print or the negative—the result would be the same in either case—of particles of injurious matter, soot, and, sometimes, metallic particles from sundry manufactories, the foggy atmosphere not permitting the quick deposition that would occur during dryer weather. It may be said such spots would readily be seen and removed; but, as a matter of fact, experience shows that such is not the case with at any rate the average printer; further, particles so minute as not to be noticed are quite capable of setting up a species of catalytic action resulting in a decidedly visible blemish.

If now we follow the subject to the consideration of particular and local causes, we find a multitude of sources, most of them well-known ones. Sufficient cannot be said about the need of care in the handling of hypo; unless it be used in a place far away from prints and printing, it is surprising how readily it gets into the air and injures the prints most seriously. We recently heard of an instance where the special care taken to avoid this evil had the very opposite effect to that intended. The principal of the establishment we refer to insisted upon all his printers wearing aprons in the interest of cleanliness. One of these *employés* was very careless, and an investigation into the cause of a serious number of spots and stains showed that he had allowed his apron to become almost saturated with hypo, particles of which were blown or brushed off on to the prints, and at other times his hands touching the deceptive protection became sullied with hypo, and prints were finger-marked in consequence.

One fertile source of spots must not be forgotten—the presence of particles of iron in the paper itself, or of injurious atoms in the albumen. At one time Rives paper was very liable to this defect, some paper being almost unusable; but now it is reduced to a minimum. We have seen spots, or rather stains, produced at this time of the year through incipient stains in an unvarnished negative. The silver had set off on to the gelatine, and produced markings which would rapidly ruin the negative. To print from an unvarnished negative when the atmosphere is at all humid is simply to invite the production of stains.

We may conclude our remarks by describing the cause of a large outbreak of spots which completely puzzled the head of a very large printing establishment. Small black spots of all shapes were present in such numbers as to be the cause of serious loss. It seemed impossible to find out their origin, until one day it was observed that the damaged prints (cabinet size) all were printed in some new frames that had been put into use. A further investigation showed that microscopically minute particles of brass, produced either in finishing off the frame or by the friction of the spring in opening and shutting the back, were readily discernible. A thorough cleansing of the frames, over all the surface and into the corners, was at

once carried out, and the evil was laid. So simple a cause had such widespread results that we deem it most useful to describe the occurrence, thinking the same may operate in other printing rooms. In any case, we trust the wide basis we have laid for tracing the cause of spots may be the means of enabling this evil to be mitigated, if not entirely banished.

PRINTING FROM DEFECTIVE NEGATIVES.*

One of the methods successfully applied in collodion days for thus strengthening weak negatives consisted in coating the reverse side of the glass with a mixture of honey (or glucose), gum, and bichromate of potash, and, after printing *through* the negative, dusting on powdered plumbago, which, adhering more readily to the unexposed portions than to those acted on more or less by light, formed a second negative image in one operation. This process, though simple enough in the hands of those who may be *au fait* in it, is not one that will recommend itself to the average photographer of to-day, more especially as its use in connexion with gelatine negatives is attended with serious inconveniences. But an efficient, if not a superior, substitute is to be found in collodion emulsion and the method of reversal.

It is a by no means difficult matter to coat the back of a negative with collodion or emulsion without injuring the front, nor is it beyond the range of possibility to develop an image on the reverse side without seriously endangering the original. But precisely the same result can be attained by forming the supplementary negative on a separate sheet of glass, so that, everything considered, that is the plan we counsel.

Take a plate prepared with bromised collodion emulsion—or, for that matter, a plate sensitised in the bath, so long as the collodion contains an iodide—and, placing it in the printing frame in contact with the *back* of the negative to be strengthened, expose to light through the film. Develop in the ordinary manner with alkaline pyro in any similar or "chemical" developer, only carrying the action much further than would be done if the image had to be fixed in the ordinary way; then, without fixing, flow over it a solution of "iron alum" (or potassio-ferric sulphate) of the strength of about fifty or sixty grains to the ounce. Under this treatment the positive image first developed will disappear, leaving a negative image composed of unreduced bromide of silver, in which, if the exposure and development have been right, the shadows will consist of perfectly bare glass. In order to arrive at this result, it is needful to give a full exposure and to carry the development to its fullest extent, even to fogging the plate.

It will be observed that the further the development is carried the more silver bromide will be reduced and subsequently removed by the ferric sulphate, and the thinner will be the image that remains. As it is essential that the shadows be quite clear, and as only a comparatively thin supplementary image is needed, it is advisable to over, rather than under, do this part of the business; indeed, although it is a somewhat delicate operation to make a perfectly satisfactory negative by this plan to print alone, for the purpose we have in view it is quite easy. With the class of negative it is intended to remedy the kind of image that is required as an auxiliary is one that, although generally thin, presents comparatively greater contrasts than would be desirable for printing alone; and these conditions are favoured rather than otherwise by carrying the first development to its fullest extent.

* Concluded from page 164.

In many instances the delicate image left by the iron solution will be dense enough without further treatment; but, if not, after washing thoroughly, let it be exposed for an instant to light and redeveloped by means of alkaline pyro, though in performing this operation it must still be borne in mind that a very thin deposit is what is required.

If the supplementary negative thus produced, after drying and varnishing, be placed in contact with the original, and made to "register," it will be surprising what an addition it makes to the apparent density as well as contrast, and what was previously a feeble image, with no printing value, will be found transformed into a strong and vigorous negative; but, if examined closely, the compound negative, however well the two portions may be "in register," will present a slightly "fuzzy" or indistinct appearance, as if wanting in sharpness, owing to the impossibility of getting every portion of the two images, as viewed by the eye, to coincide perfectly at the same time.

Some years ago a new style of portrait was introduced by a Russian artist named Denier, the effect of great softness and delicacy being obtained by forming a double image, one on either side of the glass; and these "Denier effects" all exhibit this peculiar indistinctness, which strikes the eye most at the first glance, and becomes less and less appreciable the more closely the picture is examined.

Such, too, is the effect produced by the supplementary negative used as we have described, consequent, no doubt, upon the slight overlapping of the two images in printing; but if the printing frame be set in motion during exposure, as already mentioned, the indistinctness entirely disappears, for the reason that the shadows of the second image, in consequence of the slight interval between the two, is constantly changing its position, and so vignetting itself into the original, with the result that, combined with perfect definition, there is the greatest delicacy and softness and an entire absence of any suspicion of "dodging."

It only remains to say that, in the case of hard negatives, the only difference in treatment is that the supplementary image is an under-exposed positive, instead of a negative, and is produced in the same manner, by simply printing direct from the original negative, and fixing instead of reversing. But it must be very thin indeed—more so, in fact, than in the case of the reversed negative image. What is wanted usually is simply a slight veil over the darker portions of the picture—the drapery or coat of a portrait, for instance—while the face and lighter portions remain clear glass. This end is gained by an exposure so short that the heavier portions only of the picture show any deposit, and that of the slightest, while the face remains expressionless and blank, except it be for a patch or two representing the shadows under the eyebrows, nose, and chin.

With a little ordinary care, any photographer, by following the instructions given, can easily apply the process we have indicated, and, though entirely unpossessed of any artistic skill in the direction of retouching, may produce really good results from negatives that would otherwise demand considerable attention at the hands of the retoucher.

Automatic Photography.—When shall we hear the last of the automatic photograph companies? Not, we imagine, until all the little assets remaining are swallowed up in legal matters. The most amusing part of the business, to all but the unfortunate shareholders, is that all connected with the affairs, from the aristocratic directors downwards, deny all responsibility in the matter, and any

knowledge of what was being done. The former, however, took pretty handsome fees, while others reaped a good profit. "Where ignorance is bliss ——"

Chicago.—Just now that British exhibitors, photographic and others, at the forthcoming Chicago Exhibition are considering their arrangements, the medical press generally are warning the public against the insanitary state of the city. It appears that in the year 1891 there were twenty thousand cases of typhoid fever, and that nearly two thousand of them terminated fatally. This is by no means a pleasant look-out for those who have arranged to visit the States during the show. Large numbers have done so, we believe, in parties such as those organized by the Polytechnic Institution.

Uniform Price of Specifications.—It will interest many of our readers to note that in future the specifications of patented inventions are to be issued at the uniform price of eighteen pence each, post free. Any specification in stock can be obtained from the Patent Office for that sum; and arrangements have been made with the Postmaster-General by which postal requests in the form of a postcard, price eightpence, will be on sale at each post-office, so that, the number and year of a particular patent being known, one may, by filling in the blank on the card, have a copy of the specification delivered by return of post without further expense or correspondence.

An Interesting Exhibition.—*A propos* of the above subject, the Assistant Secretary of the Photographic Society of Great Britain is at present organizing an exhibition of silver prints made thirty years, and upwards, ago. Such a collection of photographs cannot fail to be not only interesting, but also instructive. They will illustrate photography in the early days, as well as show that photographs on paper are not necessarily of the extremely fugitive character that some would lead us to imagine. The interest in the prints will be further enhanced if the exhibitors will attach to them such particulars as they possess. For example: process by which they were toned, strength of sensitising bath, character of negative, mountant used; also the conditions under which the prints have been kept, and any other information that can be supplied. From this Exhibition a lesson may be learnt.

Fading Silver Prints.—This subject formed the topic for discussion at a recent meeting of the Photographic Society of Philadelphia. The general opinion of the members appeared to be in perfect unison with that we have so often expressed in these columns, namely, that in the majority of cases the fading of silver pictures is more due to imperfect fixation than it is to insufficient washing; also that a prolonged washing, instead of conducing to permanence, actually militates against it. By long soaking in water the tones of the print become degraded, and, this being the case, it may fairly be assumed that, as vigour is lost, the stability of the image has been impaired. It must be borne in mind that the washing being effected in a short time does not imply that it is necessarily incomplete, any more than that a prolonged soaking ensures the removal of the hyposulphites. Prints can be as perfectly washed in an hour or two as they can in four-and-twenty hours.

The Exhibition in Paris.—Those of our readers who intend contributing to the International Exhibition of Photography to be held under the auspices of the Syndicated Corporation of Manufacturers of and Dealers in Photographic Specialities and Cameras in Paris, from April to September next, in the World's Exhibition (1889) Buildings, may obtain all particulars of Messrs. Marillier & Robelet, Civil Engineers, General Agents for Exhibitors, 42, Boulevard Bonne Nouvelle, Paris. The exhibits will be divided into eight groups as follows:—1. History of Photography. 2. Scientific Photography, Astronomy, Micrography, Photo-topography, Medical and Legal Photography. 3. Amateur Photography. 4. Professional Art Photography. 5. Industrial Photography, Photo-engraving, Photo-collography, Photo-lithography, Photoglypty, Photochromy, Stereoscopy, Photography on Silk, Glass, Linen, Enamel, China, Ivory, Wood, &c. 6. Chemical Products and Photographic Specialities, Collodion Films, Plates, Papers, Acids, Salts, Gelatines, &c. 7. Photographic Material, Optics, Mechanics, Cabinet Work, Leather Goods, Paper, Glass and Studio Requisites. 8. Trades connected with Photography.

New Societies.—At the present time there are something like 250 photographic societies in the United Kingdom. Are they all required? At one time there were but three in the metropolis—the Photographic Society, the North London, and the South London. Photographers, both professional and amateur, were more enthusiastic in the art in those days than they appear to be now, for although the two latter Societies met at the opposite ends of London—Walworth and Islington—the majority of the members of one were also members of the other, and what is more, as may be seen by reference to old volumes, they attended the meetings and took part in the discussions. Now it seems as if Societies must be brought to photographers instead of their going to them. In almost every district of London there are several small Societies where one would be ample, and indeed, more useful than several petty ones. Take the west of London, for example. Here is the well-established and energetic West London Photographic Society, the Ealing Society, the newly formed one at Chiswick, and now it is proposed to start a fourth at Notting Hill. Surely one, or, at most, two societies would be sufficient for this district, seeing the rail, bus, and tram facilities there are for reaching every part of it. Promoters of new Societies would do well to bear in mind the aphorism, "Union is strength," and that one good Society is better than half a dozen minor ones.

A "Tall" Business.—In reading the accounts of the "interviewer"—as well as the description of some establishments, even connected with photography—one is sometimes inclined to suspect that either the interviewer or the interviewed, or possibly both, have been somewhat "drawing the long bow." In the last issue of one of our monthly contemporaries is a description of Mr. W. J. Byrne's premises at Richmond, and, if this has not been the case in this instance, the gentleman is to be congratulated on the extent of his business. In the account it is said, "there were the negative rooms, with a stock of over two million negatives, a large proportion of them in 12×10 size and upwards." Now, two millions are expressed in two words, but some fail to realise what they actually mean. The writer had previously said that Mr. Byrne has been in business twenty years; consequently, discounting the "over," he must, on the average, have taken one hundred thousand negatives a year, or, omitting Sundays and holidays, when, of course, the studios are closed, an average of three hundred and twenty-five per day. The glass used for negatives of the smaller sizes weighs fifteen ounces per superficial foot; for larger sizes, particularly in the wet-collodion days, considerably more. As a large proportion of the negatives are 12×10, and larger, we will average them at 8×6, and the glass at one pound to the square foot; consequently two millions of such negatives would weigh nearly three hundred tons—equal to a train of thirty trucks of coal, weighing ten tons each. Every one knows the number of negatives put into stock does not represent the number of plates exposed, hence the cameras must have had a pretty busy time of it. As we have just remarked, if there has been no mistake, Mr. Byrne is to be congratulated on the extent of his business—due to the quality of the work he has issued.

TRIPLE LANTERN CONDENSERS.

Having for so many years advocated the employment of triple condensers for the lantern for certain purposes, it is gratifying to find that there is now a reasonable prospect of their being more generally adopted than they have hitherto been. For several weeks we have had lying beside us drawings, and a description of one which has been prepared by Mr. W. I. Chadwick, the nature of which will be ascertained from the following brief description. Interposed between the well-known plano-convex condensers and the light, is a meniscus rather smaller in diameter than the others, the peculiarity of its

mounting being such that the lens is very loosely placed in the cell, to permit of expansion under the great heat to which it is necessarily subjected, and also that, should a fracture occur, this lens can be instantly removed, and another put in its place; certainly a great convenience.

Mr. T. R. Dallmeyer has also been devoting his attention to this subject. In constructing condensers to be employed in conjunction with projecting lenses of definite focus, he has hitherto adopted the double form introduced by the late J. H. Dallmeyer, in which the lens nearest to the light is a plano-convex flint, and the second lens a bi-convex crown, with the deeper side towards the flint glass. By this combination the elder Dallmeyer obtained better results than had hitherto been obtained, both as regards correction for spherical aberration and a nearer approach to achromatism.

In view of the fact that it is a great convenience to employ a portion, at any rate, of one condenser perpetually, and to introduce a variable element to be used in conjunction with projecting lenses of various foci, Mr. T. R. Dallmeyer has constructed a triple condenser, in which he has utilised the principle, first laid down by Herschel, of employing two lenses of one kind of glass, with their radii so arranged that for parallel rays these two lenses by themselves are perfectly free from spherical aberration.

Counting from the light, the first lens is a concavo-convex meniscus, and the second an inverted crossed lens—that is to say, the deeper side of the crossed lens is farthest from the light.

If the light were a theoretical point and placed at the focus of these two lenses, for parallel rays, of course, a perfectly parallel beam would emerge from this portion of the condenser (a very useful and essential condition for experiments with polarised light). Close, again, to the second lens is inserted a third lens, or even combination, that has a focus for parallel rays of the desired length, suitable for the projecting lens that it is intended to employ, so that the first two elements may be considered a fixture, and the third lens may be of any chosen focus to suit the focal length of the projecting lens by simply interchanging one for another.

CAMERA CLUB CONFERENCE.

The Annual Conference of the Camera Club, which opens on Tuesday next in the rooms of the Society of Arts, under the presidency of Captain Abney, promises to be unusually attractive. On the afternoon of that day Messrs. Bothamley, Warnerke, Pringle, and W. Willis are to read papers on *Some Points in Connexion with Development, Chemigraphic Etching, Photography applied to Medical Research*, and *Recent Improvements in Platinotype* respectively. In the evening there will be a symposium on *Artificial Lighting in Photography*, in which Messrs. Vanderweyde and E. J. Humphery take part, while Mr. H. E. Armstrong, F.R.S., subsequently discourses on *The Theory of Development*. On Wednesday afternoon the programme leans largely to the art side of photography, Messrs. Henry Blackburn discoursing on *The Debt of Art to Photography*, H. H. Stannus on *The Uses of Photography to the Decorative Artist*, and H. P. Robinson on *Paradoxes of Art, Science, and Photography*. The President concludes the Conference with a paper on *Some Uses of Celluloid Films*.

The annual exhibition of members' work opens at the Camera Club on Monday evening; the annual dinner is to be held on Wednesday evening, and on the following night there will be an exhibition of lantern slides in the theatre of the Society of Arts.

The programme of papers arranged embraces subjects of interest to all sections of modern photographers, and a successful Conference should result. Admission to the meetings is free to all, no tickets being necessary. In face of this fact, combined with the excellence of the programme, to which so many able men are to contribute, we hope that the enterprise and liberality of the Camera Club will be rewarded by large attendances.

THE PLATINOTYPE PRINTING PROCESS.

[North London Photographic Society.]

The basis of this process, it is almost superfluous to say, is the elementary metal platinum, a member of a group known as the noble metals by reason of the difficulty attending their oxidation.

This property is enjoyed by some dozen metals in a marked degree and prominent among these are gold, iridium, osmium, palladium, and platinum, whose slight affinity for oxygen induces them to part company with combining bodies on very slight provocation; and thus it happens that the salts of platinum are reducible by inorganic as well as organic deoxidisers, the metal reappearing either in a soft spongy condition or as a finely divided black powder.

The metal is known to chemists by the symbol Pt and the equivalent 198, its specific gravity being 21·5.

It is found in alluvial deposits in little plates (hence its name) in Mexico and Brazil, but chiefly in Siberia, its export thus coming under the control of the Russian Government, who keep up the price by high export duties and monopolies to special metallurgical houses.

Hopes were at one time entertained that Australia would have furnished us with supplies, but, from the high price still maintained by the metal, these hopes, so far, are not realised.

The metal itself is silvery white, hard, and infusible, except in the oxyhydrogen flame or electric arc, but, being *malleable* at a high temperature, is used for making crucibles, retorts, ends of lightning conductors, &c., and is purchaseable in wire and sheet of any size or thickness.

The chief point of interest for photographers is that the metal is reducible from its salts by ferrous sulphate associated with potassic oxalate, and the high merit of the platinotype process consists in its so controlling the reactions that the reduction to the metallic state takes place in exact proportion to the exposure to light.

My admiration for the process is unqualified, unbounded, and I cheerfully concede all the advantages which are claimed for it, viz., superior sensibility to light, simplicity of manipulation, and absolute permanence.

1. It is three times as rapid as silver.

2. Pictures are developed instantaneously, fixed in half an hour, and washed in the same time.

3. The unoxidisability of the metal in the presence of air and moisture is an unquestionable guarantee of absolute permanence, and the inventor, Mr. Willis, is to be congratulated on having devised the prince of printing processes.

The method is as follows:—

1. Good strong paper is sized with gelatine, or starch, or arrowroot, the former tending to produce blue tones, the latter brown.

2. Paper so sized and dried is coated with a mixture of ferric oxalate and chloroplatinite of potassium, dried and exposed to light.

3. During the exposure the ferric salt becomes reduced to the ferrous state with the evolution of carbonic acid.

4. The ferrous salt thus produced in molecular contact with the platinum salt becomes the active agent in precipitating the platinum black, which is really the metal itself in a fine state of division.

5. The unaltered mixture of platinic and ferric salts is removed by immediate immersion in dilute hydrochloric acid, and, assuming the exposure to have taken place under a negative, the picture is now practically finished.

6. To ensure the complete removal of the iron salt, the immersion in hydrochloric acid is made three times, and for ten minutes in each dish.

7. After the last immersion the prints are copiously washed in a running stream of water for not less than half an hour, and then blotted off and dried.

I have thus briefly rehearsed the process as conducted at my own printing works at New Southgate, producing such results as I have the pleasure of exhibiting this evening.

It will not unnaturally be asked on what does success in this process mainly depend? Correct exposure in the printing frame is, of course, very important, but it is not a *sine-quâ-non*, since over or under-exposure may be compensated for in development; but, to secure high finish and delicate purity of whites, the paper should be recently prepared, and, above all things, be kept, before, during, and after exposure, absolutely dry.

To this end advantage is taken of the strong affinity of chloride of calcium for water. Asbestos is saturated with chloride of calcium and dried at a red heat, and this preparation, spread on the bottom of the boxes containing the paper as it passes through the various stages, effectually dries the contained air, and obviates any reaction occurring until the moment of development, and thus prevents the degradation of the high lights. Finding the calcium tubes sold for this purpose inconveniently small where large numbers and large sizes are required, I some years since designed a special box for the purpose, which I will endeavour to describe.

Well-seasoned pitch pine was planed, dried, and saturated with solid paraffin; it was then made into a dove-tailed box of suitable size, and coated at a high temperature with three successive coats

of shellac varnish. Around the top of the box is a ledge covered with soft, pure (not vulcanised) indiarubber, upon which rests in air-tight contact a heavy sheet of plate glass, accurately fitting the frame thus prepared for it. Over this is inverted another but lighter box of similar construction to the first, to exclude the light, which would otherwise enter through the glass lid. At the bottom of the first or inner box is a flat porcelain tray, on which is spread the dry calcium-saturated asbestos, the paper is kept ready cut to sizes from 12 × 10 downwards, the ordinary japanned tin calcium tubes being retained for the larger sizes of prints and stock of paper. Boxes of similar construction may be, of course, employed for receiving prints from the frames while awaiting development. The frequent unrolling of paper and rolling up of prints prior to placing in the tubes is thus avoided.

At this stage of procedure we find it necessary, when a sufficient number of prints have been made, to assort them into three classes —viz., under-printed, over-printed, and correctly printed. Of course there should be only one class—viz., the correctly printed; but, when there are fifty or a hundred frames to look after, the 20 × 16's and the 15 × 12's naturally claim most attention, on account of the attendant greater loss if the larger sizes are not correctly printed, and thus some of the smaller sizes get sometimes over-done. These may often be saved by dexterous development at a low temperature, while a picture a little too highly printed may be made to yield a vigorous print by prolonged immersion at a higher temperature, and similarly a correctly exposed print may be spoiled by too much or too little of the bath at too high or too low a temperature.

I may not leave unnoticed the cold-bath process, by which very excellent results have been obtained by some manipulators. I have never practised it, being compelled by business considerations to adhere to the process I know to yield results acceptable to my clients.

In the cold process the image is still produced by the reduction of a ferric oxalate to the ferrous state, but the platinic salt is associated with the potassic oxalate in the developer, an arrangement which does not commend itself to my judgment, though doubtless, as already stated, acceptable results are producible.

The "printing-out" platinum paper is obviously one in which the platinic or platinous salt is associated with the reducing agent, and is thus ready for reduction as soon as exposed to the vapour of hot water. I have never tried it. This process is applicable not only to paper, but also to cotton and linen fabrics. The results are beautiful and interesting, but chiefly applicable for decorative purposes, and I much regret that my engagements have prevented me from preparing some for exhibition this evening. The most suitable fabrics are linen, Nainsook muslin, and sateen.

Enlargements in platinotype are made direct by electric light or daylight, but, requiring a prolonged exposure, are liable to loss of sharpness from vibration. In producing them at my Southgate Works, the same plan is followed as in making carbon enlargements —viz., making an enlarged negative first, and then printing and developing in the usual way.

JAMES MARTIN.

RATIO OF GRADATION.

In reply to the able and relevant criticism of Mr. Channon, permit us to say that he has probably overlooked the fact that we have chosen the formula which expresses the connexion between the amount of metallic silver per unit area and the transparency of the film containing that silver, not because it rests upon any clear and rigorous mathematical demonstration, but because it is the expression which best accords with the results of our very carefully made experiments.

The formula $T = e^{-s}$ is not at all our property; it is found in every text-book on physics, and all we claim is to have proved that the silver deposit in photographic plates obeys this law so closely that an optical method of determining the amount of silver may be based upon it.

If Mr. Channon prefers the formula which he ascribes to Mr. Plener, on account of the reasoning on which it is based, rather than the one which we have adopted, and which is so strongly supported by experimental evidence, we have, of course, nothing to say. We submit, however, that the reasoning which leads to our formula (which reasoning is not our property at all) is superior to the reasoning which leads to Mr. Plener's formula as modified by Mr. Channon.

The reasoning upon which this formula we adopted is based does not involve any explanation of *how the light is reduced* by the particles of silver. The reasoning which leads to Plener's formula clearly does involve such an explanation at its very first step. In writing the expression $(1 - a)$ as the transparency of the first layer, the idea is involved that all light which impinges upon the area a occupied by the particles of silver in the first layer is totally absorbed. The next step in the reasoning, to be consistent, requires careful consideration as to the influence of this area a occupied by the silver particles in the second layer upon the area $(1 - a)$ left open in the first layer. To be consistent, the smallest amount of light which could pass would truly be $(1 - 2a)$, but it might be anything between $(1 - a)$ and $(1 - 2a)$, the amount depending wholly upon the relative position of the particles in the two layers in which they are supposed to be equally and evenly distributed, and therefore equidistant. There is no clear reasoning in Mr. Channon's letter which shows that, if the particles of silver in the first layer allow the amount of light $(1 - a)$ to pass, two layers would allow the light $(1 - a)^2$ to pass, or which makes $(1 - a)$ for the first layer into $(1 - a)^n$ for n such layers, if the implied meaning of a be retained.

Nor can we admit that, in reality, the layers are such that all the particles are either wholly above or wholly below a particular imaginary plane. Probably such an arrangement does not occur in nature; nor will nature conform to the first assumption, namely, that the area a of the silver wholly extinguishes the light impinging upon it. But we shall be glad to have Mr. Channon's complete derivations of the formula $(1 - na)^m$, as representing the transparency for m layers, each containing n particles of silver per unit area, and each particle covering the area a.

We here repeat, in another form, Mr. Channon's table illustrating the difference between the two formulæ. In addition to the transparencies, we have given their negative logarithms, which we call the densities; and we show how far the ratio of densities agrees with or differs from the assumed ratio of silver present.

Assumed relative silver.	Transparency.		Density.		Ratio of Densities.	
	H. & D.	Plener.	H. & D.	Plener.	H. & D.	Plener.
1	·9044	·9044	·044	·044	1	1
20	·3660	·3487	·436	·457	10	10·5
10	·1340	·1074	·873	·968	20	22·2
40	·0179	·0061	1·746	2·214	40	50·8
50	·00658	·00098	2·182	3·008	50	69·0

It will be seen that the densities derived by our formula are in the same ratio as the relative amounts of silver assumed, while those derived by Plener's formulæ are not proportional to the relative amounts of silver at all, but grow much faster.

The following are the results of our experiments, made with photographic films of the same thickness, but containing different amounts of silver by reason of having been exposed for different lengths of time to a standard candle. The densities of the negatives were measured in our photometer, and the silver afterwards determined gravimetrically.

Density Measured.	Ratio of Density.	AgCl Weighed.	Ratio of Weights.
·525	1·00	·0163	1·00
·960	1·83	·0299	1·83
1·470	2·80	·0450	2·76
1·970	3·75	·0611	3·74

Density of Silver Formulæ.	Ratio of Densities.	Relative amounts of Silver employed.
3·155	100	100
2·130	67·5	66·6
1·580	50·08	50·0
0·745	23·6	23·8
0·383	10·46	10·0
0·155	4·91	5·0

It will be perceived that this range of densities, with the exception of the first, is almost precisely the range Mr. Channon has chosen for his argument, and it comprises the entire range generally prevailing in good negatives. Within this range it is our formula and not Plener's which is applicable. But our formula is applicable within a much greater range, as is shown by the following results of another experiment, in which equally thick layers of an emulsion containing reduced silver were measured, the relative amounts of silver being adjusted beforehand.

The only other remark which we need make is that Mr. Channon restricts this application of our formula to slow plates. We emphatically state that, though we have investigated hundreds of plates of the most varying rapidity and comprising almost all the well-known commercial brands, we have not yet found one of them which does not yield progressions of densities similar to those published in our paper provided this plate was evenly coated. There are exceptions, as we know but too well; but they are invariably traceable to inequality in the thickness of the film. If Mr. Channon knows of plates

which give results differing materially from those which may be calculated by our formula, we shall be glad to procure them at once, or to receive a sample from him, for the purpose of investigation, upon the results of which we will duly report.

F. Hurter.
V. C. Driffield.

NOTES ON SOME NEW RAPID ORTHOCHROMATIC COLLODIO-BROMIDE EMULSION PROCESSES.*

[Journal of the Photographic Society of India.]

Dr. Jonas gives very full details about the preparation of the colouring solutions. For colouring the solution, various dyes of the eosine series, or cyanin, may be used in combination with silver nitrate and alcoholic ammonia. Each 100 c.c. of the emulsion should contain 1·7 milligramme of silver nitrate and an equivalent amount of dye, as well as a certain quantity of picrate of ammonia and glycerine. The following solutions are prepared:—

I.—Eosine Solution.

Eosine (yellow shade)	4 grammes.
Distilled water	50 c c.
Alcohol (ninety-six per cent.)	450 ,,

If erythrosine is used the proportions are the same.

II.—Silver Solution.

Silver nitrate	3·4 grammes.
Distilled water	50 c.c.

Strong solution of ammonia is added till the solution is clear and alcohol to make up 200 c.c.

III.—Solution of Ammonium Picrate.

Picric acid	2 grammes.
Distilled water	10 c.c.

Ammonia is added to neutralise the acid, and then alcohol to make up 300 c.c.

These solutions are used in the following proportions:—

Solution I. (Eosine)	75 c. c.
,, II.	30 ,,
,, III.	30 ,,
Pure glycerine	20 ,,
Alcohol (96 per cent.)	45 ,,

The solution is allowed to settle for a day or two, filtered, and 20 c.c. are added to 100 c.c. of the plain emulsion.

The formula for use with erythrosine differs slightly from the above—

Solution I. (Erythrosine)	75 c.c.
,, II.	30 ,,
,, III.	30 ,,
Pure glycerine	25 ,,
Alcohol (96 per cent.)	120 ,,
Distilled water	20 ,,

The muddy solution is allowed to stand for a quarter of an hour, and strong ammonia is dropped in till it becomes quite clear; it is then allowed to stand for a day or two, filtered, and is mixed with the emulsion in the same proportion as the above, *i.e.*, 20 c c. to 100 c.c. of the emulsion.

After the addition of the colouring solution, the emulsion is well shaken and filtered through cotton wool, and is then ready for use. The coloured emulsion keeps good only for one or two days and is best used on the day of preparation. It should, therefore, only be mixed in small quantities as required for use. (Some coloured emulsion was found to be absolutely insensitive after a week.)

I have found that the difficulty of keeping the coloured emulsion may be obviated by coating the plate with the plain emulsion, either washed or unwashed, then washing it under the tap and flowing over it the coloured tincture of eosine or erythrosine, diluted to half strength with water. In some cases this may be a more convenient way of working. A solution containing—

Erythrosine	1 gramme.
Silver nitrate	1 ,,
Picric acid	1 ,,
Ammonia (sp. g. ·880)	about 30 c.c.
Spirit of wine	500 ,,
Water	500 ,,

used as a bath has also given very good results.

Dr. Jonas says that emulsions coloured with eosine give soft, harmonious negatives, while the erythrosine gives more density and contrast. I have not yet tried eosine, but erythrosine has given me very bright pictures. In trials with wet collodion, made some years ago, I found than cyanosine gave by far the best results, but it does not seem to do so in this process.

In his paper Dr. Jonas has given an account of the spectroscopic behaviour of his coloured emulsion. It shows the ordinary increase of sensitiveness in the yellow and yellow-green, and, on account of the addition of the picrate of ammonia, is less sensitive to blue and violet. Observations with the sensitometer show that the eosine or erythrosine-stained emulsions containing an excess of silver show about 21° on Warnerke's sensitometer when exposed for one minute at a distance of about ten inches from the standard amyl acetate lamp, and are 350 to 400 times as sensitive as a wet collodion plate under the same conditions.

The exposure is about one-third of what would be given with a wet collodion plate and no yellow screen is necessary in copying paintings, &c. I have found that, practically, the plates coated with washed emulsion coloured by the methods described above, are about as sensitive as Wratten's "Ordinary" plates.

Before coating glass plates with emulsion they must be prepared with a suitable substratum of gelatine, or it may be sufficient to simply pass some of the gelatine solution round the edge of the plate.

Dr. Jonas gives the following formula:—

Gelatine (white)	5 grammes.
Distilled water	500 c.c.

When dissolved add—

Glacial acetic acid	15 c.c.
Alcohol	15 ,,

The plates are well cleaned in the ordinary manner usual for wet plates, and are then flowed twice with the above solution and allowed to dry in a place free from dust.

I find that this solution does not give an even coating, and might be better thinner. It answers, however, very well indeed when applied to the edges of the plate, and can be kept for use as required.

For the coating and development of these colour-sensitive emulsions the light in the dark room must be red, or such as is used for the most sensitive gelatine plates; yellow light will not do.

The plates coated with these coloured emulsions are most sensitive when exposed in a *moist* state. If allowed to dry, they are said to be about ten times less sensitive. I have not tested this, but it seems not impossible to find a method of retaining the sensitiveness of dried plates.

For plates to be coated with the coloured emulsion, all that is necessary is to coat the plate with emulsion, place it in the dark slide, and expose just as it is. In using the bath for colouring, I first coat the plate, then wash under a rose after the coating has *well* set, then flow with, or place in, the diluted colour tincture for a few moments, to thoroughly and uniformly wet it, then drain, put in the dark slide, and expose.

For developing the plates Dr. Jonas recommends a hydroquinone developer which seems to be a slight modification of that recommended by Dr. Albert. The formula is, however, rather complicated:—

Concentrated Hydroquinone Developer.

A.

Distilled water	500 grammes.	
Sodium sulphite	200 ,,	(250 Albert)
Potash carbonate	200 ,,	(250 ,,)

B.

Hydroquinone	25 grammes.
Alcohol (96 per cent.)	100 c.c.

C.

Ammonium bromide	25 grammes.
Distilled water	100 c.c.

The concentrated developer is then mixed in the following proportions:—

A	100 c.c.	
B	5 ,,	
C	7 ,,	(5 Albert)

The proportions of B and C may be varied as necessary, the hydroquinone giving strength, the ammonium bromide clearness, and the carbonate of potash sensitiveness.

The developer for use is made as follows:

Concentrated developer	150 c.c.
Water	1000 ,,

The strength may also be varied according to circumstances.

I have used with good results a hydroquinone developer made up of—

Hydroquinone	1 part.
Sodium sulphite	4 parts.
Lithia carbonate	1 part.
Potassium bromide	5 parts.
Water	100 ,,

Also ferrous oxslate developer as made up by Mr. B. J. Edwards for gelatine plates.

The para-amidophenol developer seems very well suited for these plates and gives clear, vigorous results.

Para-amidophenol hydrochlorate	1 part.
Sodium sulphite	5 parts.
,, carbonate (anhydrous)	4 ,,
Water	200 ,,

First dissolve the para-amidophenol in the water, then the sulphite, and finally the carbonate. In this way there is no precipitate, but if there should be any it may be redissolved by heat.

This developer gives great density and clearness and seems almos

* Concluded from page 168.

inexhaustible. One of the plates I have with me was the seventh developed in a few ounces of it; but, as you will see, it is the strongest of the series, and, indeed, is too strong. After eight plates had been developed the developer was barely discoloured, and would develop many more.

I have also tried pyrogallic acid developer, using the formula for pyro and ammonia recommended by Dr. Eder for a similar process; but, though it gave nice soft pictures full of detail, there was a want of the brilliancy and density shown by the para-amidophenol. It is likely that different developers may be found most suited for different classes of work.

The plates can, if necessary, be intensified, either before or after fixing, with any of the ordinary acid pyro-silver or hydroquinone-silver intensifying solutions, or, if extra density is required, by the bromide of copper or mercurial processes.

For fixing I have used hypo; the image clears at once, and a very much shorter washing is necessary than is the case with gelatine.

Over dense negatives may be reduced with hypo and red prussiate of potash in the same way as gelatine negatives.

As you will see from the specimens I have brought with me, the entire virtue of the process lies in the coloured sensitising solution of eosine or erythrosine-silver and ammonium picrate which was discovered by Dr. Albert. A plate coated with the coloured emulsion and exposed for one minute to a coloured picture gives a fine, dense, brilliant image, well orthochromatised for the yellow, while a plate coated with the same emulsion, but not coloured, and exposed for the same time and developed with the same developer, gives only the ghost of an image. This effect is very remarkable, and its cause is not quite clear. You will also see that with the same exposure and development the collodion plates are quite equal to, if not better than, those taken on Wratten's "Ordinary" gelatine plates, either plain or orthochromatised, under exactly the same conditions. It may be mentioned here that the colouring solution given above when diluted to 1 : 10,000 forms an excellent orthochromatising solution for gelatine plates, though it remains to be seen how they will stand the excess of silver in keeping.

The exact value of the ammonium picrate has yet to be investigated. Dr. Vogel seems to think it unnecessary, but it undoubtedly adds to the orthochromatic effect of the eosine dye.

I am sorry I am not able to show you a more extended series of specimens of work done by the new process, but those I have will, I think, be sufficient to show you its capabilities and possibilities. There is little doubt that the plates may be made more sensitive. The process is certainly a simple one, and, so far as I have yet found, does not require any very special precautions in working. Under the conditions under which we could work it in the office, it would be much cheaper than gelatine and probably even cheaper than wet collodion, certainly so if unwashed emulsion were used. The saving gained in time would be a further economy. The process is not, however, in its present form an out-door process, and is more suitable for copying and studio work. I hope on some future occasion to be able to give fuller working details; my object at present being more to draw your attention to the capabilities and proper value of this interesting discovery of Dr. Albert's, as applied by Dr. Jonas, which appears as yet to have attracted very little notice in England."*

Col. J. Waterhouse, S.C.,
Assistant Surveyor-General of India.

PLATINUM TONING ON MATT-SURFACE PAPER.

[Newcastle-on-Tyne and Northern Counties Photographic Association.]

At the present time there are so many different printing papers in the market, that it is a difficulty with the amateur photographer to decide which process to adopt. The tendency at present is to obtain warmer tones on a rough or matt-surface paper. I hope to demonstrate to you this evening how very simply this is done.

We have all worked with the ordinary albumenised paper, and can, doubtless, produce a good print; and, as the working of plain paper is in every respect similar, I think you will all agree with me that this process is better suited to the amateur's requirements than any other. Very beautiful matt-surface prints can be obtained on any of the various brands of gelatino-chloride papers; but the manipulation of these papers is a little more complicated—the prints require to be passed through an alum bath, and then squeegeed on to ground glass, or (as demonstrated by Mr. Brown at our last meeting) rubbed with powdered pumice stone till the desired surface is obtained. These operations are, of course, not required if you start with the matt-surface paper. Toning takes only a fraction of the time required to tone albumenised paper with any of the usual formulæ for gold baths. Blisters (the *bête noir* of the amateur) are unknown; there is neither albumen nor gelatine present to cause these objectionable comparisons.

The brand of paper I have always worked with is that made by Mr. Valentine Blanchard; he sends his paper out with a supply of toning solution sufficient for the paper. My own toning bath is made up from the formula given in Mr. Lyonel Clark's work on platinum toning, and I may as well mention here that the formulæ I shall have occasion to mention later on are all taken from that same excellent work. I have tried them myself, so can testify to their working satisfactorily.

I will now briefly run through the operations necessary to produce a matt-surface, platinum-toned print, and am sure, if any of you will take the trouble to sensitise your own paper, you will be amply repaid; you will find the home-sensitised paper prints much more quickly than the commercial article, and another great advantage is, you can select a paper with the necessary degree of roughness to suit the subject you are about to print. The paper I have used when sensitising has been Whatman's drawing-paper—this is an excellent paper for the purpose, and can be had in several grades of surface. The rough water-colour paper is specially suited for large prints. It has only one objectionable feature, and that is, it is very porous, and before the end of the washing gets something like saturated blotting-paper; great care is therefore necessary to prevent tearing or otherwise damaging the prints.

Having selected the paper, the first operation is to size and salt it. This is done in one operation, the paper being floated on a solution of chloride of ammonia and arrowroot, as follows:—

Arrowroot	180 grains.
Chloride of ammonia	160 ,,
Water (to one pint)	20 ,,

Or,

Arrowroot	180 grains.
Chloride of ammonia	120 ,,
Recrystallised carbonate of soda	240 ,,
Citric acid	60 ,,
Water (to one pint)	20 ,,

The arrowroot is made into a stiff paste with a little cold water; then about fifteen ounces more water added; then boiled till clear. When clear, it is removed from the fire, and, when sufficiently cooled, the chloride of ammonia, dissolved in the remainder of the water, is added. This solution should be allowed to stand all night; the clear portion is poured off into a suitable dish, and the paper floated on the surface of the liquid. I find Whatman's paper requires about three minutes floating to be properly impregnated with the solution. After removal from the salting bath, the paper should be laid, face upwards, on a level table, to allow the solution to be absorbed, then hung up to dry. I find, if hung up to dry directly it is taken from the bath, that the solution runs down in streaks, and, though not noticed when the paper is dry, unevenness of silvering takes place in consequence. It is as well to salt a good supply of paper when you are about it, as paper in this condition will keep any length of time. The back (or unsalted side) should have a pencil mark put on it for future guidance.

The salted paper is now ready for the silver, or sensitising bath, made up thus: Dissolve—

Citric acid	25 grains.
Water	½ ounce.

And

Nitrate of silver	60 grains.
Water	½ ounce.

These solutions are made separately and mixed. The salted paper is then floated on the solution, care being taken that no air bubbles are between the liquid and the paper. Three minutes will be found long enough for the paper mentioned; it is then removed from the bath and hung up by a wooden clip to dry. This operation must be performed by gaslight, or in the dark room. Paper sensitised in this manner will not keep very long, it is better to sensitise just as much as you require for present use.

Printing is carried on to about the same degree as with albumenised paper till there is a distinct bronzing in the deepest shadows; when sufficiently printed, the prints are washed in several changes of water and toned in following solution:—

Chloroplatinite of potash	4 grains.
Nitric acid	1 or 2 drops.
Water to	2 ounces.

On immersion in this toning bath, the print immediately begins to darken and toning to the black stage is arrived at in about five minutes. If warmer tones are required, it is better to dilute the bath to four ounces with water. The action is then more under control, the toning action stopped as soon as the desired tint is obtained.

Fixing is conducted in the ordinary hypo bath; four ounces of hypo to one pint of water made slightly alkaline by the addition of a few drops of ammonia. I find, however, this alkaline bath has a tendency to produce a warm tone, and if a black tone is desired I use the acid fixing bath recommended for negatives containing one ounce of bisulphite of soda and four ounces of hypo to the pint.

After fixation the prints washed in the usual manner to free them from hypo and dried between blotting-paper.

Having now briefly run through the necessary operations from plain paper to finished print, I think you will all agree with me that this process is about as simple as any. You have nothing new to learn, simply print, tone, and fix with the usual intermediate washings, and you obtain a picture which will be "a thing of beauty and a joy for ever."

T. O. Mawson.

* Since the above was written I notice that Dr. Jonas' paper has been translated in full in *The Amateur Photographer* for July 17, 1891.

THE LEGAL SIDE OF PHOTOGRAPHY.

[Leytonstone Camera Club.]

The lecturer divided his subject under the following heads:—1, Copyright Act; 2, Injunction, with damages, for breach of contract or good faith; and, 3, Caricature of a photograph amounting to libel. Under the first head of the Copyright Act were contained the subdivisions, first, of an assignment from one photographer to another; and, second, of the relation between the sitter and the photographer. The Copyright Act, 25 & 26 Vict., c. lxviii. s. 1, provided that, at the time of assignment of any painting or drawing of a negative of any photograph, the vendor was not merely by reason of his purchase entitled to the copyright, for it was provided, at the close of the section quoted, that the vendee should not be entitled to copyright, unless, at or before the time of sale, an agreement in writing, signed by the vendor or his agent, should have been made to that effect.

The strict interpretation, therefore, of the section led to the result that, if there had been an assignment of the property without simultaneous assignment in writing of the copyright, the assignee would have no title to enter himself at Stationers' Hall as holder of the copyright. But, modified by judicial decision, this is not actually the law. The lecturer pointed out, that both in this and other cases it would be impossible to understand the relation between legislature and judicature without a general view of the mode in which our statutes were framed. A Bill is introduced, drawn by a skilled draughtsman, of which its unity and consistency is dependent on the relations of the details to the leading conception in the draughtsman's mind, and the result of its alteration by a Committee and by the House, without sending it back to the draughtsman to be finally put into shape, is precisely the same as if a committee of artists, each armed with a pencil, were allowed to make such alterations as they thought fit in an able sketch that was brought to them. The result is that, when an Act comes before the Courts, there is in some clause a ludicrous perversion of justice that compels the Court to give some subtle and ingenious twist to its meaning in order to make it consistent with common sense and equity. This fate the Copyright Act has not escaped, for, in Graves's case, 4 Q.B.R., p. 715, one Walker, having been fined under the Copyright Act for piracy of copyright, at the suit of Graves, appealed, on the ground that the painter of the paintings in question had not registered its title, neither had the assignments prior to Graves's been registered, and that Graves therefore had no copyright. The Court, however, decided that it was sufficient that Graves was registered as proprietor; that it was not necessary for him to deduce his title; and that, consequently, there was a valid copyright that had been pirated. This is an obvious evasion of the Act, but an evasion on equitable grounds; but, of course, the judges did not profess to evade it, but gave subtle and ingenious reasons for making the clause mean the reverse of what the unaided human intellect would suppose it to be. In point of fact, the legal eel cleverly wriggled out of the legislative frying-pan, but did not upset it.

The law, therefore, enables any undisputed proprietor of a negative to register as proprietor, subject to his stating on registration the name of the true author. But as to who is the author is again decided by the Courts; one might suppose that the proprietor of a photographic business was the true author, and, in point of fact, primary owner of any photograph taken on his premises, and that his salaried assistants were no more the authors than would a merchant's accountant be, as between him and the world, the author of the merchant's accounts; but, under the case of Nottage and Another against Jackson, the Court decided that the author was not the principal of the photographic business, but that such author was the skilled artist who actually took the negative. Thus it was clear that in law the copyright of an ordinary photograph belongs, in the absence of an assignment, to the actual individual who takes it, even though this individual be the paid servant of another, and uses his employer's utensils.

This was confirmed by Mr. R. Thiele, of the London Stereoscopic Company, who, in the course of a discussion with the lecturer, gave some interesting particulars of the custom of the trade. The lecturer stated generally that it would be better for any one, as far as possible, to stick to the literal meaning of the Act, so far as circumstances would permit, rather than rely on any subtle interpretation given by the Courts, which in some subsequent case might be modified in some other way. Again, in reference to the second point under the Copyright Act, namely the relation between the sitter and photographer, the Court had leaned towards the alternative that the sitter had the property in the negative, because it was executed on his or her behalf. But this was simply a dictum arising incidentally, and there had been no case on the point. It would be simply ridiculous to deny that the photographer was entitled to the plate where, as usual, the sitter had paid for a dozen or two copies, with the arrangement that he was to get further copies at a reduced price; and, if the point were expressly raised, it would probably turn on the question, that what was executed on behalf of the sitter was not the negative, but the copies from the negative, and that the contract would be interpreted by the invariable usage that the photographer retained the negative, and that the understanding between the parties did not include anything else but the copies or positives that were contracted to be paid for. Mr. Thiele, in afterwards commenting on this point, stated that the usage of the trade was to consider the negatives as the property of the photographer, but with the limited right of use subsequently referred to in the lecture.

Referring, now, to the question of the use that may be made by the photographer of copies from the negative in the absence of an express or implied permission, it was shown that in the case of Pollard *versus* the Photographic Company, the photographer was restrained from selling or exhibiting copies for example as a Christmas card exhibited in shop windows, because he was bound to give copies only to the sitter, or by his or her direction, and that any more extensive publication was not only a breach of contract, but a breach of faith.

Turning now to the question of amateur photographers, the lecturer expressed some doubts as to the mode in which the law could possibly deal with them, seeing that, when an amateur photographed his friends, any improper use of the photograph could neither be considered a breach of contract nor a breach of faith incidental to contract. But a hint appeared to assist the matter, both in the case of the limited use allowed to be made by the receiver of the letter, whose property it undoubtedly was, and therefore not a matter of contract, and also in the case of a person who had intruded into a lecture-room, without the lecturer's privity, and was restrained from publishing a shorthand copy of the lecture, though, in this case also, there was no contract between the lecturer and the copyist, and therefore, strictly speaking, no breach of faith. In like manner, if an amateur scattered copies about of his friend's photograph, it is probable that, even in the absence of contract, he might be restrained from making a public use of the copies, which was not justified by the fair understanding between his friend and himself at the time. This, however, is purely speculative, and the recommendation to be given to amateur photographers was that, if they ever took any one else's photograph except for his own use, it would be better to have express permission if a more extended use was contemplated. T. Watson Brown, B.A., LL.B.

PHOTOGRAPHY IN THE COLOURS OF NATURE.

In an article on "Natural Colours on the Lantern Screen" (British Journal Photographic Almanac for 1892), Mr. Albert W. Scott makes the following statement:—

"A brief description of the (Scott) process was published by the writer in The British Journal of Photography in January 1891; and a demonstration with his apparatus was given early in May, before the Manchester Photographic Society," &c. "Soon after, in June, Mr. Ives brought before the notice of the Franklin Institute a similar apparatus, arranged by himself, on the same principle; that is, all three negatives were taken on one sensitive plate, were projected by a special lantern front, in such wise that the three images accurately coincided on the screen. Both these demonstrations appeared to be very successful."

The above appears to me to be about as unfair and misleading a statement as human ingenuity could devise. I believe, however, that the unfairness may be due partly to ignorance of facts. Already I have had occasion to show that Mr. Scott has given his own name to an ether saturator which could not be manufactured in this country without infringing my rights under two patents granted to me for original invention; and now, after bringing out a degenerate imitation of a method of projection upon which I have been working for many years, achieving notable success years before Mr. Scott attempted anything in this direction, he would have it appear that I am the imitator instead of the one who is imitated. The fact is, that I have copied absolutely nothing from Mr. Scott, and would gain nothing by doing so; while, on the other hand, Mr. Scott has already copied many things from me, without giving credit for anything, and will have to copy from me in every essential particular before he can possibly produce results worthy of comparison even with those which I showed in February 1888.

With reference to Mr. Scott's claim to have originated the triple camera and lantern slides (both worthless so long as the negatives are made from separate points of view, as in Mr. Scott's camera), I have to call attention to the following facts. The first exposure I ever made on a landscape for purposes of colour projection was with a single plate, sensitive to all colours, behind three lenses, with selective colour screens, and diaphragms adjusted to make the three pictures develop together. My reason for doing this is indicated by statements made in my first communication to the Franklin Institute upon this subject, when I said, in one place, that I used "photographic plates sufficiently sensitive to all parts of the visible spectrum. Means for filtering out, in a strictly accurate manner, such coloured rays, and in such quantity or proportion as may be required." And, in another place, "I find it necessary to prepare the three sensitive plates at the same time, with the same emulsion, and to develop them in the same developing solution for the same length of time." But I added also another requirement, as follows:—"A camera that will produce three negatives simultaneously, of exactly the same size, and from the same (or very nearly the same) point of view." This latter requirement

explains why, in 1888, I cut the single plate into three pieces after preparation, in order to secure the same chemical effects without destroying the coincidence of perspective required to secure register in the finished results. Mr. Scott has merely gone back to a plan which was old, and partly abandoned for its imperfections in 1888: and the successful return to my original plan has not been made possible by any invention of Mr. Scott's, but by my own invention of a camera that makes three negatives on one plate from one point of view.

The use of a single lantern slide from the three negatives is also my own idea. The slide, shown successfully in February 1888, was a single wood-mounted slide, and was projected with a single lantern, having three optical systems as close together as possible. Dozens of the members of the Franklin Institute examined with interest both the slide and the construction of the lantern. One reason why such details were not published is that such details are not patentable in this country, as in England; and another, that they are very trivial matters in comparison with the invention and demonstration of a scientific solution of the problem of colour-reproduction by photography.

The triple lantern-front devised by me is entirely different from Mr. Scott's, and, unlike his, is interchangeable with the ordinary projection lens, without change of light or condensers. Already, although it possesses important advantages over Mr. Scott's device, I have given up its use with the limelight, because my device of 1888 gives so much better illumination.

Mr. Scott's statement, that his demonstration, like my own, was successful, is disproved by his admission that landscape reproductions were unsuccessful. The processes of Du Hauron, Albert, and others, made striking, though not true, reproductions of highly coloured objects, but necessarily failed to reproduce the delicate colours of natural landscapes. Mr. Scott's process, based on a very old and long-exploded theory of colour, also necessarily fails on such subjects.

In conclusion, although every special device employed by me in carrying out my process of composite heliochromy is an original invention of my own, and superior to any imitations or substitutes so far known, these inventions do not represent one-fiftieth of my labours in composite heliochromy, and are of comparatively small importance. It is clear that substitutes may be found for mechanical and optical devices, but it is very doubtful if good results can ever be produced with any of them unless they be used to carry out a principle which is distinctly my own, and by which success has for the first time been achieved.

F. E. Ives.

[The foregoing, which was posted in Philadelphia in January last, only reached us during the preceding week, having just been recovered from the wreck of the *Eider*.—Ed.]

ELEMENTARY NOTES ON PHOTOGRAPHIC LENSES.*

Modifying Lenses.

Full advantage is rarely taken of the power of modifying or temporarily altering lenses for special requirements, and giving them qualities that in their original form they did not possess, although to any one whose stock of lenses is limited this power may at times be of immense value, as they may be made to work satisfactorily where they would otherwise have failed entirely.

The most simple modification is that of using either of the single lenses of a rapid or wide-angle rectilinear alone, giving a lens of about double the focus of the compound. In many rapid rectilinears the front lens is of longer focus than the back, so that there is a choice of two. If the front lens is used alone, it should be screwed into the back of the mount. With these single lenses it must be remembered that, by the alteration in proportion of aperture to focus, the exposure will require to be about four times that for the same stop when using the compound lens; and also, from the fact of a stop being necessary with any single lens, that, although a rapid rectilinear may give brilliant definition with full aperture, yet the singles of which it is composed will not work satisfactorily without stopping down to about half their diameter, or using the stop marked *f*-16, which will then be about *f*-32. These single lenses being about double the focus of the compound will give an image of any object about twice the size, or they will cover a much larger plate well, and include on that a similar view to that given by the original lens on the smaller plate. The stop being much nearer the lens than it would be if the single had been specially constructed and mounted to work as such, the distortion is very slight, and, when used on the same size plate as the original lens, it is practically rectilinear, and may be used for any work.

A rapid rectilinear may be converted into a wide-angle of the same focus by having a short mount made to carry the combinations closer together, the gain in covering power depending on the extent to which they are closed in. This does not alter the focus of the lens to any material extent, so that there is no difference in the size of the image that it will give on the plate that it would cover in its original form. The gain is, that it may be made to cover a considerably larger plate, and one that includes a wide-angle. As an example, a half-plate rapid rectilinear may have its covering power increased to enable it to be used for 10 × 8, or even 12 × 10 plates. There is no gain without a corresponding disadvantage, and this is no exception to the general rule. The principal objection is, that the field is rendered very round, so that, in taking advantage of the increased covering power, small stops have to be used in order to bring the edges and centre of the picture sufficiently in focus together. For that reason the new mount should not be shorter than is necessary to cover the plate required. The closer the lenses are brought together, the greater will be the covering power, but the more will flatness of field be lost. For those who rarely have occasion to use a wide-angle lens, the necessity for using smaller stops is not such a great objection, as in other respects it works well.

The front lens of one rapid or wide-angle rectilinear may be used with the back lens of another to produce a new combination having a focus intermediate between the two from which it has been formed; so that, if the front lens of a ten-inch rapid rectilinear is used with the back lens of a six-inch, the new combination formed will have a focus of about eight inches, or probably a little less. This combining two lenses to form an intermediate size can be effected with scarcely any loss of quality, and in some instances critical examination will fail to detect any material difference in flatness of field, covering power, or evenness of lighting.

To obtain the best results, three conditions are essential. First, the longer focus of the two lenses should always be in front; second, the distance between either lens and the stop should be the same as in its original mount; third, similar lenses of the same maker should be used. Dissimilar lenses may be combined as two of different construction, or even a rapid and a wide-angle rectilinear; but in that case the result will not be so good, and smaller stops will have to be used in order to make it work well.

Where the focus of each single combination is known, the focus of the compound lens that they would form can be easily calculated, and so determine whether it would differ sufficiently from others already available. The formula is, let A and B represent the focal lengths of the two lenses, and C their distance apart in the mount, then the focus = $\frac{A + B}{A + B - C}$. With a single lens the curvilinear distortion varies with the distance between the lens and stop. By bringing these closer together the distortion may be so minimised, that it becomes inappreciable, and the lens may be used for architectural work. Its effective diameter is reduced the nearer it is to the stop, so that it necessitates a much smaller aperture in order to obtain crisp definition and flatness of field; consequently, the extent to which the mount is shortened should depend on the distortion given by the lens under its normal conditions of working.

Selection of Lenses.

In giving these modifications of lenses, it is not intended that they should take the place of those specially made for certain work; but there are very few amateurs who can provide themselves with a large number of lenses, and those who have one or two only may, by some of these methods of obtaining other forms or combinations, produce satisfactory negatives of subjects which otherwise it would be useless to attempt. The selection of a lens by an amateur should not be a difficult matter, if the class of subject for which it is required, and the qualities and disadvantages of the various forms are carefully considered. For those whose principal aim is pictorial landscape, with occasional figures or slowly moving objects, a single lens working at *f*-16, or, for special objects, *f*-11, would be the most satisfactory instrument possible. It is sufficiently rapid for shipping and sea pieces generally under favourable conditions, as these subjects are almost invariably well lighted. If great variety of work is to be done with only one lens, the most useful would be the rapid rectilinear, as this answers well for such a wide range of subjects and conditions where other lenses, specially good in their own sphere, fail.

A very good equipment for amateur work generally, where two lenses can be provided, would be, for half-plates, a single about nine inches focus and a wide-angle rectilinear about six inches, for most architectural subjects, interior and exterior, have to be taken in confined positions, where the use of a longer focus lens is less satisfactory or impracticable. The back combination of this would be about twelve inches focus, and available for those subjects in which the nine-inch single would include

* Concluded from page 167.

too much. This is practically three lenses, a sufficient outfit for all work excepting that of such a character as to require special provision under any circumstances.

For racing, animals in rapid movement, or similar subjects under a variety of conditions, a lens of great rapidity, such as an euryscope, will be almost a necessity, though an objection to this is the accurate focussing required, owing to the very small depth of focus that its large aperture allows. For the majority of instantaneous studies a rapid rectilinear will fulfil all requirements.

Any technical question connected with photography must, in order to be of practical utility, have a direct bearing on its artistic aspect, by rendering the production of a desired result more certain and definite. While technical perfection alone would be insufficient to produce a picture, yet equally artistic perception and training are of little value to their possessor unless he has also the manipulative skill necessary to give full expression to his artistic creations. HENRY W. BENNETT.

PLATINUM TONING AS APPLIED TO GELATINO-CHLORIDE PRINTING-OUT PAPER.

[Newcastle-on-Tyne and Northern Counties Photographic Association.]

FASHION, which regulates the cut of our garments, has, as might be expected, some considerable influence in matters photographic. During the past two years there has been a steady movement in the direction of warmth of tone. In the higher regions of photographic art there was a time when "Big and Black" held supreme sway, and anything approaching tones which most of us now admire was a thing held accursed. Now men's minds are everywhere asking, How shall we arrive at the warmest tones? and skilful concoctors of formulæ are holding high revel in their search for the mystic process which shall forthwith make all things sepia. The numerous methods of toning (or staining) bromide papers recently published afford evidence of how strong is the revolt against blacks. We have, indeed, need to be careful lest, by over-doing it, we induce a revulsion of feeling. Above all, let us not outrage the eternal fitness of things by such proceedings as printing winter landscapes a bright red, and so forth.

Amongst all the methods of getting rich warm tones, I know of none equal to that which it is my privilege to bring before you to-night—viz., the use of a gelatino-citro-chloride of silver paper and chloro-platinite of potassium as the toning agent, as by its means we can get tones of the most exceeding richness and warmth with ease and certainty.

GELATINO-CHLORIDE DESCRIBED.

After lying stagnant for many years, the gelatino-chloride process has at last become very popular. In its original form it was a collodio-chloride emulsion, invented by Mr. G. Wharton Simpson in 1865. It never made much headway—why, it is difficult to say. To my mind, a collodion image is in many points superior to a gelatine one. Amongst its principal exponents was a north-country photographer—Mr. George Bruce, of Duns. In 1882 Captain Abney proposed a gelatine emulsion, and his formula became the foundation on which every one has subsequently built, until the analogous collodion paper was almost forgotten. On the Continent, however, there has for the last year or so been in use a collodio-chloride paper, and recently a similar product, under the name of Celloidin paper, has been introduced into the London market by Messrs. H. Kuntzen & Co., samples of which I show you to-night. The late Herr Obernetter was first in the field, in 1885, with his now celebrated emulsion paper, followed by Liesegang, and after the lapse of five or six years we now have the choice of at least two brands "made in England."

My intention to-night is not to read a scientific paper, or to indulge in any theoretical or chemical speculations, but rather to go upon solid ground, over which I have myself trodden, steering clear of everything which has not been thoroughly substantiated in my own experience, and will treat (1) of printing, (2) of the toning bath, (3) of the process of toning, and (4) of finishing.

It may be mentioned here that my experience almost solely relates to Obernetter paper, but I have handled nearly every brand in the market, and shall have something to say of each.

Printing is conducted in the ordinary way, any negative that is not either hopelessly thin or dense being suitable. Contrary to the text-books and advice so plentcously given, it is not necessary to over-print any more than on albumen paper—in fact, to do so is in most cases distinctly harmful.

After toning with platinum, no paper I have yet tried reduces to any great extent in a properly made fixing bath, and if we desire a matt surface, and so squeegee on ground glass, that operation considerably adds to the depth of the image; so, if we over-print, "leatheriness in the shadows" will result. It is necessary to remember, however, that the depth of printing must have some definite relation to the tone we desire to obtain. This will be discussed when we come to the toning stage.

The toning bath which I have found to be the best is a simple one:—

Potassium chloro-platinite	1 grain.
Citric acid	10 grains.
Distilled water	4 ounces.

A platinum bath will only work when acid, and the use of citric acid, instead of nitric, as usually recommended, is a great improvement, due to Professor Burton, who found that the latter acid has a staining influence upon gelatine.

Other baths have been recommended, which are not so good as the above, and possess the serious disadvantage that they will not keep, whereas this one will keep indefinitely provided the prints be properly washed before toning, so as not to contaminate the bath by silver salts. I have here a bottle containing a bath made up over two years ago, which has been in constant use ever since, strengthened when necessary by adding more platinum, which I keep in a dropping-bottle mixed in the proportion of one part platinum to twenty parts water. When of proper strength, the bath is of a dark straw colour, and as the toning agent is used up the solution becomes paler, so that by a little observation it is easily seen when the bath wants strengthening.

THE MANIPULATIONS OF THE PROCESS.

Coming to the actual manipulations, the first item is the preliminary washing, which must be *thorough*. The first wash must be rapidly performed, so as not to keep the prints soaked in the dissolved-out silver, else yellowing of the high lights will result. After four changes of water, it is necessary to dissolve out all the remaining free silver by a salt bath. After a minute or two in this, and another rinse in water, the prints are ready to tone. At this stage they are but little changed, and the process of toning, unless much prolonged, produces no effect that is visible to the eye. We only discover what tone we have got when the prints are in the hypo bath; but the action is so regular that success is certain. It is instructive, however, to see what colour of image we are working upon by fixing a print without any toning, and I will presently show you a few examples. It will be found that the image suffers a very considerable reduction, and partakes of a yellowish-red hue. By simply fixing without toning, warm red tones can be got if we print deep enough to compensate for the reduction that takes place, and there is no reason to suppose that such images should fade any more than does a bromide print. Indeed, the chances are in favour of the former, as it has not been in contact with any salts of iron, or acid clearing bath. I have spoken of the necessity of keeping up a definite relation between the depth of printing and the ultimate tone desired. Simply fixing a print much reduces its depth, but the more platinum we associate with the silver image the less does it reduce. This applies to all papers, but in a greater degree to the Ilford "Printing-out-paper." Toning then proceeds on certain definite lines, the stages being red, reddish-brown, sepia, brown, dark brown, and purplish-brown. For the first stage, printing ought to be continued till the deepest shadows are slightly bronzed, and the toning will take, say, five minutes. With such an over-printed image, longer toning seems to intensify the print, and to block up the shadows. For any other tone than red, it is not advisable to print till the bronzing stage is reached, but to stop when the whites are slightly tinted, and toning will be accomplished in from five to fifteen minutes. The warmth of tone, which is the characteristic of this process, it is evident has for its foundation the yellowish-red of the silver image, and, as we associate it with platinum in a greater or lesser degree, the tone varies from a warm red to the other shades I have named. There have been various attempts to completely substitute platinum for the less stable silver, but with no success. It was first supposed that the toning process was a depositing of metallic platinum upon the image; then it became the belief that a partial substitution took place: but Lyonel Clarke, in his book, assumes, with considerable show of reason, that an alloy of silver and the nobler metal takes place. Be that as it may, it is a process which, for certainty and beauty of results, merits every one giving it a fair trial.

After toning, the prints may be immersed in a weak solution of common soda, to neutralise any acidity present and stop toning, or may be placed direct in the fixing bath, made distinctly alkaline with ammonia, and not stronger than one part hypo to eight parts of water. For the sake of giving the prints a fair chance in the battle of life, it is advisable to have the hypo bath fresh, and to fix for not less than half an hour. After thoroughly washing in copious changes

of water, the prints are given a five-minutes' soaking in a bath of chrome alum of about twelve grains to the ounce. To avoid acidity, neutralise this with ammonia, and filter out the dense precipitate which is formed. This is of the greatest advantage, as it hardens the gelatine and renders it almost impervious to damp. So great is its hardening effect that a print so treated and dried cannot again be softened, and resists water almost boiling.

The next stage is the squeegeeing, which is best done upon finely ground glass. Bear in mind, however, that this must take place as soon as they are washed free from the chrome alum, as, if they are allowed to dry, they cannot be so treated. The adoption of the alum bath makes the sticking of prints to the glass almost an impossibility, and this is no small advantage. Much rubbish has been written about cleaning the glass plates previous to putting down the prints—by myself amongst the number. If really dirty, monkey soap will remove it all. Flowing hot water over the plate, and rubbing with the palm of the hand, will do the rest. It can then be placed under the tap and cold water run over it, then place the wet print in position, with blotting-paper on the top, then a piece of waterproof sheeting, and squeegee vigorously. It is necessary to remember that any attempt to remove the prints before they are dry is to court failure. A matt surface may be got much more easily by the use of finely ground pumice-stone powder, rubbing it on the dry print by hand. Mounting presents no difficulty if the prints be properly hardened in the alum bath.

Characteristics of Various Papers.

It only now remains for me to briefly indicate some of the characteristics of the various brands of paper.

Obernetter's ordinary brand gives very fine results (his other makes I have not tried). Over-printing in the ordinary sense is not advisable, although there is a small amount of reduction. The paper is thinner than some others, and therefore must not be roughly handled.

Celerotype is a thick paper, and tones easily—printing normal.

Jacoby's requires deeper printing, and has a good range of tones, the warmer shades possessing a distinctive quality not seen in any other paper.

Luminotype, Talbot's "Beta," and Liesegang's aristotype behave well, and there is no great difference in result between any of them; but they have one defect in common, or, rather, the samples I have had through my hands possess that defect, viz., they are stained either pink or mauve.

Kuntzen's celloidin is a thoroughly good collodion paper, unfortunately also stained mauve, normal printing, and tones easily, yielding similar results to gelatine; but, on account of the hardness of a collodion image, it cannot be squeegeed.

Ilford "printing-out paper" possesses characteristics of its own. It does not require such deep printing as any of the others, and will not pass to the bronzing stage. Deep printing is indicated by blocking up of the shadows, but this point must not be reached unless short toning and reddish tones be desired. In my hands it has yielded a greater range of colour than any other brand (from yellow to almost purple). For anything approaching full toning great care must be taken not to over-print.

James Brown.

HOLBORN CAMERA CLUB EXHIBITION.

The third Annual Exhibition of the members of the Holborn Camera Club was held at Anderton's Hotel, Fleet-street, on Saturday last, nearly two hundred visitors being present. Mr. E. Clifton, Mr. F. A. Bridge, and Mr. Horsley Hinton were the judges.

In Class 1, Mr. A. J. Golding obtained the first prize for the display of the most numerous and meritorious pictures. This member sent in eleven frames of various subjects, figure studies being predominant. One of the pictures, *Going out to Sea*, an enlargement on Fry's rough paper, was awarded a silver medal. This is a photograph of a tug towing a large sailing vessel out to sea, and was full of life. Mr. Fred Brocas was awarded second prize. Mr. Brocas sent in eighteen frames, the best being some examples of Devonshire scenery.

In Class 2, Mr. H. West was awarded a prize for the best display of pictures by new members. One of his pictures, *At Rest*, obtained honourable mention. This was a bromide print, after the style of Mr. Cembrano. Two enlargements of rushes were also exhibited by this member. Mr. A. Bell obtained a prize for the best exhibit of members who had started photography during the last year. This member exhibited a frame of six country scenes.

In Class 4, Mr. E. H. Bayston was awarded first prize for a set of portrait studies, and Mr. Sharpe obtained second prize. Mr. Golding sent in an enlargement of the head of *An Old Salt*. Mr. H. Beckford was awarded first prize for the best display of six half-plates. These consisted of two interiors and some shipping scenes. Mr. A. Hodges obtained second prize for some good country scenes. Mr. E. Elsworth was awarded first prize for the best set of six quarters, while Mr. H. Thompson obtained second prize. Mr. West sent in an excellent set of six tree studies in this class. Mr. Chang was awarded first prize in the lantern-slide competition, and Mr. T. O. Phillips obtained second prize. Messrs. Fry and Eastman sent some pictures for exhibition, and the *Graphic* exhibited a large number of pictures. The *Daily Graphic* sent in a series of frames showing by the process by which the pictures were made, the first being the drawing as sent in by the artist, the next the negative taken from it, then the block in its different stages, and, finally, the print as it appeared in the paper.

During the evening two lantern entertainments were given. Mr. Sinclair gave *A Scamper through Normandy*, and Mr. Whiting some fine slides of Canterbury and Shakespeare's country.

We congratulate the Club upon the high level of excellence shown by the various exhibits, as well as upon the success of last Saturday's display and entertainment, which the pressure on our space obliges us to treat with all possible brevity.

EXHIBITION OF ENGLISH PHOTOGRAPHS IN BRUSSELS.

During the Congress held in Brussels last year, a small collection of English photographs attracted such favourable attention that it was immediately proposed to organize a representative exhibition of English work. A Committee of the Association Belge, consisting of Messrs. Maes, Puttemans, Alexandre, and Colard, was charged to organize the exhibition, and thereupon they invited a number of well-known English photographers to contribute to it. The display will accordingly open on the 25th of this month, at the Cercle Artistique et Littéraire of Brussels.

The exhibitors include Captain Abney, Messrs. Burchett, Byrne, Gambier Bolton, W. Crooke, L. Clarke, G. Davison, Distan, Dresser, Horsley Hinton, R. Keene, Maskell, H. P. Robinson, Vanderweyde, West, Winter, and others. Some of Mrs. Cameron's pictures will also be on view.

The promoters of the Exhibition have paid English photographers the high compliment of saying that the artistic qualities of their pictures have induced them to take this step, in order that Belgian photographers may profit by a study of them. Succeeding annual exhibitions will be devoted to the representative work of other countries, but "the English exhibition naturally comes first." Messrs. G. Davison and Lyonel Clarke have rendered the Association Belge valuable assistance in the work of organization.

THE MADDOX FUND.

Additional Subscriptions.

	£	s.	d.
Wratten & Wainwright	10	0	0
Sunderland Photographic Association	1	10	0
Faversham Institute Photographic Society	0	15	0
W. H. Walker	5	0	0
Percy Lund & Co.	1	1	0
Alfred Watkins	1	1	0
C. H. Evans	0	10	6
C. H. Crosby, Chicago	1	0	0
Glasgow and West of Scotland Amateur Photographic Association	2	2	0
Swansea Amateur Photographic Association	1	1	0
Warwick Brookes	2	2	0
P. Meagher	0	10	0
Rotherham Photographic Society	1	1	0
North Middlesex Photographic Society	1	17	6

Our Editorial Table.

Manuel Pratique de Phototypie.

Par J. Voirin. Paris: Ch. Mendel, 118, Rue d'Assas.

The author of this small manual handles his subject in a thoroughly practical manner, and provides a complete and lucid guide to phototypic printing. Two specimens of the process and a number of illustrations of apparatus are given in the text.

Obernetter-Perutz Negative Films and Sheaths.

Mr. J. R. Gotz, who is agent for these films, has sent specimens of the same, which we have tried, and find to give results which are

most excellent. Possessing a high degree of sensitiveness, they develop clean and with all desirable gradation.

Mr. Gotz's film sheaths are admirable pieces of workmanship. He has constructed special apparatus for making them, a feature in the apparatus being that he can make them of every size and with perfect flatness.

Ilford Isochromatic Plates.

The Britannia Works Company.

These plates are issued in two brands, these being respectively of instantaneous and medium rapidity. If we judge by the samples which we have received, these plates "have come to stay." No one knows the value, under exceptional circumstances, of colour-sensitive plates better than those who have tried, say, to copy a painting without them. A very fine optically worked glass screen accompanies these samples. This is set in a frame suitable for placing behind the lens, and greatly facilitates the ensuring of colour values. But, as we have formerly said, it is not wise to employ this in every case, as there are many subjects in which an exaggeration of the colour values of subjects might be produced. We are glad to see good isochromatic plates placed on the market under such favourable commercial conditions as those initiated by the Britannia Works Company, and can hazard a prophecy as to their popularity.

From Mr. Otto Schölzig we have received specimens of Dr. Jacoby's Collodion Emulsion Paper. This gives fine detail, and is used and treated in exactly the same way as ordinary albumenised paper. Formulæ for toning and fixing bath, accompanied the specimens. The paper can be had in three tints—white, pink, and mauve.

The Optics of Photography and Photographic Lenses.

By J. Traill Taylor. London: Whittaker & Co.

This work, which contains 244 pages and sixty-eight illustrations, and is dedicated to Captain Abney, is stated, in the preface, to be for the users, and not the makers, of photographic lenses. The subjects treated of embrace, among numerous others, Photographic Definition, Real and Ideal; Aberrations, Spherical and Chromatic; Deep Meniscus Lenses; Single Achromatic Lenses; Combination Lenses of the various types now in use; Distortion, its Nature and Cure; Foci, Testing Lenses, Lenses of Jena Glass, Lens Grinding, Lantern Optics, Photo-Telescopic Lenses. Each class of lens described has been associated with the name of its inventor, and the author expresses a hope that the work will prove useful to professionals and amateurs alike. It is obvious that no opinion of the merits of the book can be expressed here, but this does not prevent us from congratulating the publishers on its excellent printing and get-up.

Messrs. Hunter's Catalogue gives full particulars of the firm's specialities—print trimmers, plate rockers, washers, &c. There are some useful hints on mounting and burnishing in the book.

Fallowfield's Photographic Remembrancer is, as heretofore, a testimonial to the enterprise and activity of this firm. It is up to date.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 4468.—"Improvements in or relating to Cameras."—A. J. Adkins and F. B. Newman.—*Dated March 7*, 1892.

No. 4498.—"A Process for Developing Photographic Images."—J. Hauff.—*Dated March 7*, 1892.

No. 4516.—"An Improved Construction of Photographic View-finder."—J. M. Thompson.—*Dated March 8*, 1892.

No. 4606.—"Improvements in Cameras for producing or superposing Multiple Images." Complete specification.—F. E. Ives.—*Dated March 8*, 1892.

No. 4663.—"A new Magic-lantern Slide."—W. H. Mason.—*Dated March 9*, 1892.

No. 4706.—"An Improved Dark Slide for Photographic Purposes."—W. T. A. Phillips.—*Dated March 9*, 1892.

No. 4755.—"Improvements in Photographic Shutters."—A. S. Newman and J. Guardia.—*Dated March 10*, 1892.

No. 4886.—"Improvements in and connected with Store-boxes or Change-boxes for Photographic Cameras."—J. R. Gotz.—*Dated March 12*, 1892.

PATENTS COMPLETED.

Improvements in or Pertaining to Photographic Camera.

No. 6533. Richard Whitehorne Savage, 22, Bagby-road, Leeds, Yorkshire, and The Sun Camera Company, Limited, 22, Bagby-road, Leeds, Yorkshire.—*February 20*, 1892.

The object of our invention is to improve the construction and fitment of photographic cameras in various details, to render the same more efficient and generally convenient.

We erect two standards of a semi-circular or curved section wherein the front of the camera can slide, and which front is constructed with a central circular opening into the front whereof the lens tube can be screwed, while on the internal edge thereof is a flange which may extend as far therearound as desired. A frame is secured to the front end of the bellows which has a corresponding circular opening, and certain parts are removed from the edge of this opening corresponding with the aforesaid flange, which parts being brought together, the frame is pressed home and partly turned to cause the edge of the aperture to pass behind the flange, and thus secure the two parts together after the manner of an intercepted screw, proper stops being fitted and the two parts being light-tight. To this sliding front is fitted a horizontal pinion shaft actuated by a screw-head which gears into racks on the standards to raise or lower the front. Stays can be fitted to the standards, and through the upper parts thereof clamping screws are fitted to the standards, the heads whereof pass through slotted plates on the sides of the sliding front to retain the same at the desired elevation. The standards can be erected on a movable platform fitted in the base, on the edge whereof is a rack into which a stationary pinion engages to move this platform transversely, and the platform can be made in two parts, one part being centrally pivoted on the other part, and thus, while the lower part only moves transversely as aforesaid, the upper part that carries the standards not only moves transversely therewith, but can also turn on its pivot and be clamped in any position by any usual devices.

At the rear end of the base of the camera is mounted a platform, which may be capable of sliding therealong, and through this platform rises the head of a screw bolt, preferably on both sides of the base, fitted with such nuts and other appliances as to be capable of being clamped on and to the web or webs of or to the base. The upper surface of the platform is concave transversely to the base to form a seat for the complementary convex edge of the back, which convex edge is formed on the bottom and on one of the sides thereof to allow the back to be mounted on the platform in two positions, and plates are secured on these edges wherein are the usual slots formed across the same, into which slots the heads of the screw bolts can pass and travel behind the same. By this arrangement the platform can be placed in the desired position, the back can be engaged thereon, and be erected or inclined or laid flat as the slots may allow, and then the appliances on the screw bolts will clamp all these parts together. The platform may also be fixed on the base by one, preferably the front edge, in which case the rear edge is capable of being raised or lowered and there clamped, and then the back will not need to be inclined, and the convex edges are not required, but the back on its two sides as aforesaid can be slid into a groove in the platform.

On this back is the usual focussing screen contained in a hinged frame, and this screen is provided with and can be covered by folding doors, preferably fitted so that when the doors are opened the screen is moved towards the lens and *vice versâ*, and round and between these doors are fitted flexible webs which, when the doors are opened, entirely enclose the screen, except where an aperture is left, through which the focussing can be performed without the usual cloth, and inside the focussing screen a recess may be made in the frame, wherein a negative can be placed for enlargement, or reduction, or otherwise.

The ordinary dark slides may be used in this back or a detachable magazine, for a continuous film can be constructed and applied thereto as follows: A closed cylinder is made to contain a roll of sensitive film, and along this cylinder is secured a semi-cylinder, which can tightly fit on the opened top of the back, inside of which semi-cylinder is a closed cylinder, and a narrow passage is made through this cylinder into the aforesaid cylinder, wherethrough the end of the film can pass to a roll in the latter cylinder, all parts, of course, being light-tight. To the axis of this roll is secured a handle, which may surround the outer side of the back, and when this magazine is placed in position this handle can draw the lower cylinder downwards to the bottom of the back, exposing so much of the film in readiness for the exposure to light, after which the handle can be lifted, and a spring inside this cylinder, so lifted, rolls the exposed film up therein, suitable pawls or stops being fitted to both cylinders to govern the rolls, and then, by again drawing down the lower cylinder, a fresh surface of the film is exposed, and so on.

The base of this camera may be formed as usual, and, to extend the same, a transverse rod, with right and left-handed screw threads, may be mounted on the stationary part, on which threads are winged sleeves, whereto are jointed, preferably on both sides, a series of reticulated bars duly jointed together, the end pairs of bars being jointed to the sliding parts of the base; or these reticulated bars may be fitted on one side only; or when there are two or more sliding parts to be extended on one side, racks can be fitted on all the parts, and the pinions on the transverse rod would first extends the smallest part, and then the next, and so on, and when this base is long the back of a smaller camera can be connected with the front of the bellows of a larger camera by clips or screws, the intermediate back being supported from the base by travelling standards.

This camera can be enclosed in a bag or box, in the bottom and lower part whereof are such apertures as may be required for working the same or connecting it to its stand by its base, to which this bag or box can be attached. The bag or box is divided transversely into two parts which can be opened to expose the camera and closed and fastened to cover the same, and are so fitted as to hold also the dark slides, roll holder, spare lenses, shutters, and other appliances.

A long board has a longitudinal slot, wherein can travel the screw bolt by which this board can be connected to a tripod or stand, and two or more platforms can travel along this board, being fitted with racks and pinions, clamping screws, and other appliances. On one platform a smaller camera can be secured, and on the other a larger camera, the front whereof can be attached to the hood of the lens of the smaller camera by metal strips or otherwise, whereby an enlargement or a reduction may be produced, and this long board will also serve for exhibiting photographs by placing a lantern behind the camera on the one platform, which can be supported by any stand, if desired, while the other platform carries the exhibiting surface.

The camera can be contained in a rectangular rigid casing, which is divided transversely into two parts, the front part containing the lens shutter and other parts, with a finder if desired, and the rear part sliding inside the front part. On the sides of the front part are pivoted two levers, the

upper arms whereof carry or are connected with a magazine of sheathed sensitive plates, while the lower arms thereof are connected with the sliding back. Springs and other appliances are fitted in the magazine to force the plates forwards, and when a plate comes to the front it drops a little way down below the magazine, and engages on each side at its lower part studs on the sliding part of the casing. The exposure is given while the plate is in this position, and then the sliding back is drawn out, forcing this exposed plate down on its face as its lower edge is being drawn back by this sliding back, and the magazine is being moved forwards by the levers, and by such action compressing springs under its sides until, when the back is drawn out as far as allowed, this plate is clear of the magazine, and is by the springs caused to regain its vertical position, when the back can be pushed in again, thus causing the magazine also to regain its normal position with a fresh plate in the front and the exposed plate in the rear, and so on. A suitable door can be made preferably in the sliding back, wherethrough the exposed plates can be removed and fresh ones inserted, and any suitable indicating appliances may show what number of plates have been exposed. The pulling out or the pushing in of the sliding back can also obviously be utilised in setting the shutter by the appropriate means, as also for focussing by a distance scale of the sliding back and otherwise.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
March 21	Dundee Amateur	Amo. Studio, Nethergate, Dundee.
,, 21	Glasgow & West of Scotland Am.	190, West Regent-street, Glasgow.
,, 21	Hastings and St. Leonards	
,, 21	Leeds (Technical)	Mechanics' Institute, Leeds.
,, 21	South London	Hanover Hall, Hanover-park, S.E.
,, 22	Great Britain (Technical)	5a, Great Russell-st., Bloomsbury.
,, 23	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 24	Birmingham	Lecture Room, Midland Institute.
,, 24	Camera Club	Charing-cross-road, W.C.
,, 24	Hackney	Morley Hall, Triangle, Hackney.
,, 24	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 24	Oldham	The Lyceum, Union-st., Oldham.
,, 24	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 25	Cardiff	
,, 25	Holborn	
,, 25	Maidstone	"The Palace," Maidstone.
,, 25	Richmond	Greyhound Hotel, Richmond.
,, 25	Swansea	Temby Hotel, Swansea.
,, 25	West London	Chiswick School of Art, Chiswick.
,, 26	Putney	High-street, Putney.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 16.—Mr. A. Haddon in the chair.

Messrs. H. Irwin Ward, W. Hiles, J. Sharp, and F. H. Merry were elected members of the Association.

Mr. W. E. DEBENHAM gave a demonstration of the Wet-Collodion process, remarking that it still had its uses in the preparation of blocks for line work. For copying, there were several houses who would not like to be without it. Another of its uses was in making enamels by the substitution process, while, for producing lantern slides by reduction, it had always held its own. For intensifying negatives, such firms as the Autotype Company and the Woodbury-type Company probably employed it. Having pointed out the difference between wet and dry-plate development, Mr. Debenham went on to treat of the nitrate bath, which he himself had always prepared according to a formula that he gave in the BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1872. The preparation and salting of the collodion, the cleaning of the plates, the coating and sensitising, exposure and development, were in turn explained, some successful transparencies being produced. Mr. Debenham gave the following formulæ for the collodion, plain potassium iodiser, and bromo iodiser:—

PLAIN COLLODION.

Pyroxyline	100 grains.
Ether (from methylated spirit)	5 ounces.
Alcohol (not methylated)	10 ,,

PLAIN POTASSIUM IODISER.

Potassium iodide	160 grains.
Alcohol (not methylated)	5 ounces.

BROMO IODISER.

Cadmium iodide	50 grains.
Ammonium iodide	50 ,,
Ammonium bromide	10 ,,
Iodine	1 grain.

At the conclusion of the demonstration, the CHAIRMAN complimented Mr. Debenham upon its excellence and success, remarking that, if there were any present who knew nothing of the process, they must surely have gained a great deal of information from listening to, and watching, Mr. Debenham, who had given all necessary details.

Mr. A. C. HENDERSON having made several observations on wet-collodion processes and arising out of Mr. Debenham's demonstrations, it was agreed to adjourn the discussion.

Before the meeting terminated, Mr. A. L. Adams exhibited a binocular pantoscope for viewing transparencies, with a chromatrope attachment imparting various effects to the pictures.

Camera Club.—March 16.—Mr. A. HORSLEY HINTON read a paper, entitled, *Pictorial Photography of Thought*. Mr. F. Machell presided. Previous to the paper, Mr. DALLMEYER explained and exhibited a great improvement in the photographic lens which consisted of a different combination to be used in conjunction with portrait lenses. Some admirable results were exhibited, and much interest in the practical application of the instrument was displayed. Mr. HINTON, in his paper, maintained that, notwithstanding its limitations, photography was capable of expressing individual and personal ideas and feelings. For such facts he himself sought in pictorial work, he preferred to use focussing and printing methods that favoured breadth, and a general, rather than a particularising, effect. On March 31, Messrs. F. P. Cembrano and H. M. Hastings will exhibit a series of slides taken during the last convention.

Holborn Camera Club.—March 11, Mr. D. R. Lowe (Vice-President) in the chair.—Mr. E. J. WALL gave a discourse on the *Latest Novelties*. The first article under notice was a metal holder, for lantern slides on celluloid films, followed by little oval copper plates, covered with a special composition for transferring the pictures, and completing the process by firing the plate. Mr. Wall then showed a German lens which was remarkable for its covering power and depth of focus. He showed several large direct photographs bearing out these qualifications. This was followed by some examples of colour printing, which had been making rapid progress of late, and some very fine specimens of Collotype printing, as used for book illustrations. Mr. Wall stated that an Austrian photographer had recently published a formula whereby by printing on gelatino-chloride paper until all the details were just showing, and then developing the picture up before toning and fixing, a great saving of time was the result. The final "novelty" was a few remarks on the toning of bromide paper, using, instead of the uranium toning bath, the old lead intensifier. By using this, almost any colour could be obtained.

North Middlesex Photographic Society.—March 14, Mr. S. E. Wall in the chair.—Mr. WALKER delivered a lecture on *Photographic Procedure in the Dark Room*, and carried his audience through the whole process of negative-making, from the exposure of the plate to the final drying of the negative. Touching upon the principles involved just sufficiently to make his meaning clear, he dealt minutely with all points of practice, the qualities of various developers, and their peculiarities, the method of compounding the developer, and gave as his favourite—Pyro, one ounce; meta-bisulphite of potash, half ounce; water, up to ten ounces. This he considered an admirable developer for amateurs working at irregular intervals, as it would keep indefinitely free from discolouration. Meta-bisulphite was said to act as a restrainer, but he thought that an advantage to a beginner. He used the bromide and the ammonia in ten per cent. solutions, and mixed the developer in the proportions of grains to the ounce given by the makers of the plates, but, in cases of uncertainty as to exposure, kept the strengths of all the chemicals slightly weak, till the tendency of the plate was known. He then dealt with under and over-exposure, giving careful and minute advice as to procedure. Frilling, halation, and a number of other pitfalls were considered, and advice given. At the last meeting packets of bromide paper, sent by the Eastman Company, were distributed among the members. The prints made upon them were now shown, and questions as to difficulties met with were asked and answered. Some of the prints were very fine, great atmospheric effects having been obtained. Twenty-four packets of plates, sent by the Imperial Plate Company, were distributed among the members to be tested, also copies of exposure tables, sent by Mr. Manox. A beautiful print of ice crystals, given by Messrs. Martin & Co., was passed round for inspection; the crystals had assumed a wonderfully harmonious design of fern fronds and flower forms. The next meeting will be held on March 28, when Mr. Beadle will demonstrate on *Enlarging by Artificial Light without the Use of a Lantern*.

THE annual dinner of the Society took place at Beale's Restaurant on Saturday evening last, the President (Mr. J. W. Marchant) in the chair. Between fifty and sixty were present. The toast of the Society was proposed by Mr. E. J. Wall in an eulogistic speech; and Mr. J. Traill Taylor responded for "the Press." Mr. Walker and Mr. McIntosh spoke to the toast of "the Officers." The gathering was enlivened by music of a high class, and an excellent evening was passed.

West London Photographic Society.—March 11, the President in the chair.—Mr. HOWSON explained the new Ilford isochromatic plate, and performed experiments demonstrating the advantages of colour-sensitive plates over ordinary ones for a great variety of subjects. He also described the new Ilford screen, which consists of a metal framework, easily fixed on the inside of the camera front, into which the screen may be inserted in a moment, or as quickly taken out when an ordinary plate is to be used. He mentioned that in most cases a light tinted screen was required; at sunset, sunrise, or in hazy weather, it was not so much needed, because the atmosphere itself acted as a screen, and there was no excess of blue light to modify, but that for ordinary landscape work a screen was always more or less an advantage. He adverted to the necessity of having the screens perfectly optically ground, to prevent distortion, and also that they should be tested by a spectroscope, as it was probable, if these precautions were not taken, that they might get a screen that did more harm than good; also that care should be taken not to use too deep a tint of glass, or over-correction might result. In answer to questions, Mr. Howson stated that their isochromatic plates were made under a licence from Mr. Edwards; that they had a distinct advantage over ordinary plates in respect of halation, although he did not profess it could be altogether eliminated; and, replying to a question by Mr. Whiting as to whether there was not a disadvantage in taking landscapes when the effect of atmosphere and distance was required, and whether isochromatic plates did not penetrate through the haze and give too sharp an image, he stated in his opinion an ordinary plate sometimes gave too great a mistiness in the distance, and did not render the values correctly. Mr. WHITING thought that using coloured screens shortened the focus of the lens, but Mr. HOWSON said, if properly ground, he was under the impression it was not so, and Mr. ROGERS thought perhaps the solution was that the yellow rays had a different focus to the white rays. Mr. HODGES mentioned the fact that isochromatic plates had a tendency to give undue density, unless the exposure was ample.

Tooting Camera Club.—March 10.—The following officers for the ensuing year were elected, viz.:—*President*: Mr. A. H. Anderson.—*Vice-President*: Mr. J. H. Beckett.—*Committee*: Messrs. H. Berger, J. F. Child, J. A. Collingwood, W. Irwin.—*Treasurer*: Mr. C. E. Stowell.—*Secretary*: Mr. G. D'Arcy Glies, Lucien-road, Tooting Common. A communication was read

from the Hon. Secretary of the Brixton and Clapham Camera Club with reference to a proposed joint exhibition by the societies in South London, and a sub-committee was appointed to deal with the matter. Next ordinary meeting, April 7: the President will exhibit members' slides by means of his lime-light lantern.

Croydon Microscopical and Natural History Club (Photographic Section.)—March 11, Mr. W. Goode in the chair.—The Chairman showed a self-adjusting tripod made of bamboo, the tripod head having a ball-and-socket movement, with a plum-bob suspended underneath to a length of wire, this arrangement bringing the top of the joint perfectly level, it being afterwards made fast by the tightening up of a screw at the side. Mr. GOODE, in opening the subject for the evening, *Exposure and Actinometers*, said he thought experience went a long way with regard to correct exposure. Makes of plates varied very much in rapidity, and, when good results were obtained by any particular plate, it should be kept to. Mr. WEIR BROWN gave a description of exposure tables, and method of simplifying, and it was found that very little difference existed in the different tables in use. Through the kindness of Messrs. Adams & Company, Messrs. Hurter & Driffield's exposure meter, and Watkin's actinometer, were shown and described.

Richmond Camera Club.—March 11.—Mr. Clarke, of the Incandescent Company, read a paper explaining clearly the principles and advantages of the Welsbach system, and its application to ordinary house gas and oil gas. The apparatus for producing the latter from spirit of paraffin was exhibited and explained, and some lantern slides were afterwards shown by the aid of the light which, though, of course, much inferior in power to the oxyhydrogen light, was seen to be greatly superior to the oil-lamp in point of whiteness of light and evenness of illumination.

Birkenhead Photographic Association.—March 10.—One hundred and fifty lantern slides, taken by the late Dr. Arnold, when in Norway last year, were exhibited. Messrs. F. N. EATON and E. M. TUNSTALL introduced the subject of Mr. Stead's *Magic Lantern Mission*. A discussion followed, resulting in the formation of a committee to further its interests.

Derby Photographic Society.—March 8.—Mr. A. R. Dresser sent for reading a lecture on *Brittany*, illustrated by 200 lantern slides. The negatives from which the slides exhibited were photographed were all taken instantaneously with a camera held in the hand, the remarkable sharpness of outline, and width of detail of the originals, rendering the slides taken with them perfect pictures. Another series of slides by the same gentleman, animals, &c., taken at the Zoo, were also exhibited, as also was a set showing a dog taken whilst jumping in mid-air.

Leicester and Leicestershire Photographic Society.—March 9, Mr. Frank G. Pierpoint in the chair.—Lantern Slide Competition.—There were nine competitors. The Judging Committee consisted of Messrs. Pierpoint, Scotton (Derby Photographic Society), and Porritt. The results were that the first, or silver, medal was awarded to Mr. George Bankart, and the second, or bronze, medal to the Hon. Secretary, H. Pickering. The slides sent in were of exceedingly high merit, as may be conceived from the fact that only two points separated the first, second, and third exhibitors, Mr. Joliffe running the Hon. Secretary very hard for second place, and it is confidently believed that the final selection will give general satisfaction. Mr. Pierpoint being an old and practical lantern-slide operator, as also Mr. Porritt, while they were fortunate in securing the services of Mr. Thomas Scotton, who is an hon. member of the Society, and holds the responsible position of photographer to the Midland Railway Company.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

BINOCULAR APPARATUS FOR VIEWING LANTERN SLIDES.

To the EDITOR.

SIR,—On February 8 last I called at No. 2 York-street, and submitted to you a binocular apparatus for viewing lantern slides, fitted with prismatic lenses arranged in a certain way which I had designed and constructed, and asked you in a friendly way, knowing your long experience, whether it were possible to obtain a valid patent for it. It therefore seems somewhat strange to me, taking the above facts into consideration, that in your leading article in your last week's issue, more than a month after, you should have entirely ignored the apparatus exhibited to you by me, believing, as I do, that it was the first practical apparatus of the kind that had been constructed.—I am, yours, &c., BIRT ACRES.

Clifton-villa, Ilfracombe, March 15, 1892.

[The facts set forth in the first paragraph of our correspondent's letter are beyond dispute, as indeed is the further one (which he apparently forgets), that we assured him that it was *not* possible to obtain a valid patent for the binocular lanternoscope. We are not in the habit of culling subject-matter for our leading articles from the communications of those of our friends who may seek our advice, otherwise in the article referred to we should not only have felt constrained to notice Mr. Acres' binocular apparatus, but also a very beautiful one, constructed on identical principles, which Mr. Fox Shew exhibited to us some months ago. The idea, as we informed Mr. Acres, is not new. It was adopted by Mr. George Mason just prior to the Chester Convention, circumstances, however, preventing him from placing it on the market. A model of Mr. Mason's lanternoscope has been in our possession ever since that time. It was fully described in a contemporary early in 1890, in these pages during the the year 1863, and again in the same place in 1884. Mr. Acres will thus clearly see that he has been anticipated over and over again, a matter upon which, at the interview referred to, he failed to question us. Our advice upon the value of "new inventions" and "ideas" is sought daily. Does Mr. Acres hold it a matter of duty with us to travel outside the questions put to us in his own and the numerous other cases to which we have alluded, and gratuitously constitute ourselves a living encyclopædia of what has been achieved and attempted in the path of photographic invention? Does he also conceive it to be our mission to interfere between *soi-disant* inventors and the trade with the object of dissuading the latter from enjoying the luxury of tendering handsome cheques in exchange for old, if ingenious, optical devices?—ED.]

RATIO OF GRADATION.

To the EDITOR.

SIR,—I think that "Free Lance," in your issue of the 4th inst., is over-hasty in his conclusion that Messrs. Hurter & Driffield betray ignorance of their own work. He quotes from page 6 of their article, after which follow tabulated results of long and short development by the same developer. They remark that these results show that the ratio is not affected by the *time* of development. They then draw attention to other *following experiments*, to show that "no modification in the developer ever seriously disturbed this ratio." They point out, however, that eikonogen gave slightly different results; and at the close of the paper they advert to the theoretical possibility of different developers acting diversely. Bearing this in mind, I think that their statement, "This ratio, we find, is *altogether* unalterable" (the italics are mine), need not mislead any careful reader as to their real meaning, that they have only succeeded in obtaining a trivial amount of difference by the most diverse modes of development. I think that Messrs. Hurter & Driffield's explanation of their own views might be accepted without the discourteous retort to which I have alluded. "Free Lance" gives it as his opinion that the ratio can be changed at will; but will he undertake to do so, give his results, and describe his mode of operation?

It is to be regretted that Mr. Bolton has not read the original paper, which appeared the year before last in the *Journal of the Society of Chemical Industry*, in March or April, I think. He would have seen that he is mistaken in supposing that only "normal" exposures and developers had been used, or that development was pushed to its limit in all cases. To deal with all the points where he is at issue with the authors would need a long article; but I may point out that a uniform fog, which would convert the series 0, 2, 4, 6, 8, into 1, 3, 5, 7, 9, is not the action of *light* on the film as understood by Messrs. Hurter & Driffield, and its only effect would be that the latter negative would require ten times more light than the former to produce an identical positive (according to the unit-density employed by Messrs. Hurter & Driffield).

The important point raised by Mr. Channon in the JOURNAL of March 11 is answered by these gentlemen on pages 1 and 2 of their paper:—

"These relations hold good for some substances with regard to ordinary white light, for others only with regard to monochromatic light, and for others they do not hold good at all. We have satisfied ourselves that they do hold good for the silver deposited as a black substance in negatives, so long as the silver does not assume a metallic lustre and reflects but a very small amount of light."

In a subsequent communication to the Society of Chemical Industry, they give the following numerical results:—

"Four half-plates were exposed and developed to different densities. They were then measured in different places, and the densities averaged. After that, the films were taken off, treated with nitric acid, the silver precipitated with hydrochloric acid, filtered and weighed on a fine balance. The adjoining table gives the results:—

Plate No.	Density found.	Grammes Ag Cl found.	Density calculated from Ag Cl.
1	0·525	0·0163	0·525
2	0·960	0·0299	0·963
3	1·470	0·0450 .	1·449
4	1·970	0·0611	1·968

These figures will, I think, satisfy Mr. Channon of the correctness of the author's results at reasonably low and moderate densities. It may be worth while, however, to point out that a plate of the above character, whose film possessed the greatest transparency tabulated by him, would have an opacity of 1·1057, and therefore a density of 0·044 only. The unit of silver would be 0·0014 grammes per quarter-plate. It will be seen that these figures are less than a tenth of the smallest amounts dealt with by Messrs. Hurter & Driffield; indeed, the glass and film of pure gelatine of an ordinary negative absorbs much more light. Probably these quantities are altogether outside the limits under which Messrs. Hurter & Driffield have satisfied themselves that their stated relations hold.

I should esteem it a favour if any correspondent would inform me where Captain Abney's research connecting the density with the law of error is to be found, as the original paper has not fallen under my notice.—I am, yours, &c., R. C. PHILLIPS.

Arts Club, Manchester, March 11, 1892.

WHAT ABOUT ORTHOCHROMATIC PLATES NOW?

To the EDITOR.

SIR,—Some time ago, if I remember rightly, there was a correspondence in THE BRITISH JOURNAL OF PHOTOGRAPHY between Mr. Andrew Pringle and another gentleman whose name I have forgotten, bearing upon the merits and demerits of isochromatic plates for landscape work, Mr. Pringle asserting hot and strong ("at least, so a bystander would assume"), that "iso" was a bubble, and the other gentleman, equally confident in his opposite conviction, stuck up manfully for his opinion being the correct one.

After some rather hot words and "funny man" business, "a challenge was given and accepted, that each advocate should take a competition trip together, and the result of each should be judged by an impartial "jury."

I believe I am correct in my opening address. Now for my side of the question. I am totally unacquainted with any maker of plates whatsoever, neither have I any interest directly or indirectly with photography as a trade, and therefore I have no object or interest except one, of *progress*, when I ask the question, did the match referred to ever come off? if it did do so—and I presume "*it must have done*," after so public a challenge—what was the result?

I note that Professor Bothamley, and Mr. Howson, and others consider that iso or orthochromatic plates are, under certain circumstances ("and *these more than less*"), a great power in the hands of the photographer.

The photographic season is about to commence again, and I dare say hundreds, like myself, would like to know whether there is any advantage in using colour-sensitive plates or not. It is a topic that, at the present juncture, possesses great interest to every one who carries a camera, for "good work" is becoming more the order of the day, and now that colour-sensitive plates have cheapened, and are within the reach of all, it is perhaps not out of place to lay my queries before my brother tripods.—I am, yours, &c., VERITAS ET VERITAS VINCUNT.

March 15, 1892.

DEPTH OF FOCUS.

To the EDITOR.

SIR,—There seems to be a somewhat important omission from Mr. Bennett's remark on depth of focus. It can be readily shown that the distance (E F) between the focal planes is $EF = Kf^2$ where K is a constant as long as the distances of the two objects are unaltered. Also that the diameter of the circle of confusion is $a = Kfd$, where d = diameter of the stop = $\frac{1}{8}$ inch hyp. Hence, if K is the same for both lenses, we have for the 20-inch lens E F = 400 K, for 5-inch E F = 25 K; hence, if E F is 1 inch in the first case, it is $\frac{1}{16}$ in the second. Again, for 20-inch lens $a = 5$ K, for 5-inch $a = \frac{1}{8}$ K, hence the first circle has its diameter four times that of the first. But, if the camera is so placed with the 5-inch lens as to take the image the same size as with the 20-inch, K is different in the the two cases, and becomes 4 K for the 5-inch lens.

We therefore have, for 20-inch, $EF = Kf^2 = 400$ K;
and for 5-inch, $EF = 4Kf^2 = 100$ K.

So, as in Mr. Bennett's case, 1 inch becomes $\frac{1}{4}$ inch.

Also, for 20-inch, $a = Kdf = 5$ K;
5-inch, $a = 4Kdf = 5$ K.

And in this case the circles of confusion are equal.

It appears, therefore, that only when the images taken by the two lenses are equal is it true that the depth of focus depends simply on the actual diameter of the stop.

I have considered the distances to be great compared with f, as the expressions are much simplified thereby.—I am, yours, &c.,

Glenfall Lawn, Cheltenham. CLIFFORD E. F. NASH.

THE ARTIST: HIS EVER-WIDENING SPHERE.

To the EDITOR.

SIR,—I was wheedled last Saturday morning into reading your Manchester multiple artist's letter by the grand heading at the top of it. I hammered through the wordy epistle until I came to the nugget: "If the photograph was the best specimen ever produced, and the water-colour drawing the worst, the one is still a mechanical production, and the other a work of art." Then my heels went up in the air, and ——

You see, sir, I was, and still am, under the impression that any one is an artist who can produce pictures in any medium and by any method. The unveiled face of nature is, doubtless, not always pictorial, but then, as the cloud shadows sweep over the scene, the artist feels their most effective position in the landscape; and, whether he stands with a palette on his thumb or an air-charged ball between his fingers, he may, by the continuance of his thought and labour, produce an eye-attracting, yea, even a mind-moving representation of the scene he had witnessed. Grand old David Cox, on seeing an effect on the landscape before him, turned his back on it, and pencilled instantly on his block the impression he had poetically received; and so, surely, may the photographer flash on his tablet any effect when it touches him to the quick.

I would not for a moment think of placing the artistic expression of a landscape by, say, Hook or Peter Graham, within reach of a photograph; but to say that a photograph may not also be a true work of art, and the work of an artist, would suggest the possibility of one's sense and sight having become fossilised, or worse.—I am, yours, &c., J. P.

Edinburgh, March 14, 1892.

BLUE PRINTS.

To the EDITOR.

SIR,—I do not know whether the enclosed is a novelty, but it certainly is such to me. The print is printing out platinotype, which I meant to tone brown with uranium.

Usually, I use nothing but rain water for photographic purposes, but, owing to my tank being frozen, the print was washed after the usual acid (HyCl) bath, in well water, which contains a considerable quantity of iron.—I am, yours, &c., H. G. M. CONTREARE.

The Hut, Ingatestone, March 13, 1892.

THE CAMERA CLUB CONFERENCE.

To the EDITOR.

SIR,—Will you kindly allow me to remind your readers that the annual photographic conference organized by the Club will be held at the Society of Arts on Tuesday and Wednesday, March 22 and 23, from 3 to 6 p.m., and 8 to 10 p.m. on the Tuesday, and from 3 to 6 p.m. on the Wednesday.

As there seems to be some misunderstanding on the point, I should like to state that the meetings for reading of papers and the discussions are open to all, and no tickets of admission will be required.

The full programme has already been given in your pages. A copy of this programme will be sent to any one desiring same. A slight alteration will be made in the Wednesday's arrangements, Mr. H. P. Robinson's paper coming on at 3 p.m., and Mr. Henry Blackburn's at 4.30 p.m.—I am, yours, &c., G. DAVISON, *Hon. Sec.*

Camera Club, Charing Cross-road, W.C.

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

To the EDITOR.

SIR,—I have the honour to inform you and your numerous readers that the next Photographic Convention of the United Kingdom will be held in Edinburgh on the week beginning on the 11th of July proximo. The hall of the Geographical Society in the National Portrait Gallery in Queen-street, Edinburgh, has been secured for the meetings. Later on I shall have the pleasure to send you fuller particulars of papers, excursions, &c. In the meantime I shall be glad to receive the names of intending members.—I am, yours, &c., F. P. CEMBRANO, JUN.

10, *Cambridge-gardens, Richmond, Surrey, March* 10, 1892.

MR. FRY'S ENLARGING LANTERN.

To the EDITOR.

SIR,—I am not content to acquiesce in Mr. Clarke's easy description of *my* system. There are variations in principle and detail between Mr. Armstrong's method (as I read it in the pages of the BRITISH JOURNAL OF PHOTOGRAPHY, and as described by you) and mine, which go to make a vast difference in practice. The insertion of the word *not* between "was" and "exactly" in the sentence attributed to Mr. Clarke would, however, quite satisfy me; and as it is such a slight addition to the text, probably he won't object.—I am, yours, &c., S. HERBERT FRY.

The Fry Manufacturing Co., Photographic Works, Kingston-on-Thames, March 15, 1892.

KEEPING CHLORIDE OF SILVER.

To the EDITOR.

SIR,—It may be a useful hint to some of your readers to recommend them to store precipitated and dried silver chloride from print washings in glass jars. A few months ago I put a few ounces into a tin canister, and, on handling it the other day, the top of the box came away, leaving its lower half on the shelf in a deliquescent mass of what is presumably mixed chlorides of silver, tin, and iron. How can I separate and get rid of the tin and iron?—I am, yours, &c., H. K.

March 15, 1892.

[Simple washing in warm water will in all probability remove the iron and tin salts if such have been formed.—ED.]

Exchange Column.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

L. S. D.—We should give choice to the six-inch condenser.

J. JONES.—1. Filter the solution. 2. Fresh eggs are preferable.

SELF AND ARMSTRONG.—Our publishers will copyright the picture for you at a charge of 1*s.* 6*d.*

H. J.—Dr. Miethe, Editor of the *Photographisches Wochenblatt*, Berlin, will be sufficient address.

E. D.—Mr. Fallowfield, we believe, publishes a work on ferrotype, which is probably what you require.

F. SIMPSON.—Any wholesale druggist, or perhaps your chemist, will supply you with Venice turpentine.

Dr. A. C. MERCER.—Many thanks. We were unable to be present, but should be pleased to have further particulars.

W. JONES.—The particulars of your Society came too late for the ALMANAC. They appear in the JOURNAL for January 8, 1892.

INQUIRER.—If by "a useful and inexpensive material for outside showcase" you mean a background for the case, select a dark red velvet.

J. ROBINSON & SONS.—Messrs. A. Macnair & Co., Dalton-street Distillery, Manchester, are the firm who offer to supply methylated spirit of the old kind.

JOHN O. CAMPBELL.—1. Consult the catalogues of the various makers, which will be sent you on application. 2. About eleven-inch focus. 3. See answer to No. 1.

A. Z.—The best account of the very earliest processes of photography is to be found in Hunt's works on photography. They are all out of print, but may frequently be met with at bookstalls.

S. A. J. wants some paper prepared ready for Woodburytype printing, and says he is told that it cannot be had in England. Some little time ago, Messrs. Marion & Co. wrote, saying that they supplied it. Write to them.

W. A. T.—1. A rapid wide-angle lens, or any rapid wide-angle lens, say, of the Voigtlander wide-angle Euryscope type, will answer the purpose. 2. A lens of the rapid rectilinear type, which can also be used for landscape work.

W. H. C.—1. Imitation ground-glass effect may be produced by dabbing over the surface of the glass with putty. 2. Beckman of Cowcross-street, or Schulze of Long-lane, will supply you with mouldings for picture-framing.

SPECIMENS.—We have no sympathy whatever with appropriators of specimens. Write and tell the man that if he does not return your specimens by a given time you will communicate with the chief superintendent of the police in his town.

R. BLACKWELL.—There is no copyright in Hogarth's original engravings; lantern slides were made from them, and sold commercially, thirty or more years ago. If any copyright is claimed, it must be for particular reproductions of them.

ORPHAN.—Do not spend, or rather waste, your money or time on learning crystoleum colouring with a view to making a livelihood by it. No photographer would give you employment, as he would not tolerate the best of such work on his premises.

MOUNTINO asks: "Will you kindly tell me what you consider the most practical and best way of mounting photographs in an album with cardboard leaves to prevent cockling? Can thin glue be used safely?"—Yes, but the glue must have a considerable addition of alcohol.

D. EVANS.—Photo-lithographic transfer ink can be obtained at all the dealers' in lithographic materials. Ordinary lithographic presses are used in photo-lithography. The difference between photo-lithography and photo-zincography is practically none, except that a zinc plate is employed instead of a stone.

H. SHARMAN says: "In all accounts I have read of the collotype process, a drying box is spoken of. Is such a thing absolutely necessary? Would not an ordinary room answer the purpose?"—Yes, if the temperature be regulated exactly to kind of printing plate desired. The temperature at which a collotype plate is dried is an important matter. This being attended to, it is of no importance whether the drying is effected in a box or a room.

C. BENNETT inquires: "1. Can you tell me the best and simplest way to make *papier-mâché* accessories, such as a pedestal, &c.? also how to make the moulds? 2. Next to a north light, which is best, east or west?"—1. Space is far too limited in this column to give practical details on such subjects. 2. If the major portion of the work is done in the morning, a west light is the more convenient; if in the afternoon, the opposite, as then direct sunlight is avoided.

SOLICITOR.—This gentleman, who has just taken up photography as an amateur, says that he is concerned for a client in a dispute as to the value of an estate. The opponents have had some photographs taken, which they intend to show at the trial of the action, that quite misrepresent the property. He wishes to know if he can do anything in the interest of his client to combat these misleading photographs?—Our correspondent does not say in which direction the photographs are misleading, exaggerating, or the reverse, so that we cannot advise definitely. We should consult an experienced photographer, telling him that he required pictures conveying the opposite idea to those already taken.

AMATEUR writes: "I beg to inquire of you whether you know of an enamel which is used to fix photographs upon porcelain or china previous to putting same in the oven, and also what degree of heat is required?"—This query is very vague. By "enamel" we assume that *glaze* is meant. If so, this is supplied by those who sell ceramic colours to fuse at different temperatures. If our correspondent atatea his requirements to the dealer, he will supply what is required.

C. W. GASKELL (Dresden) says: "I shall be much obliged if you would tell me a good salting bath for plain drawing-paper in your next issue; also what strength of silver bath to use. Should like the formulæ in grammes." Much depends upon how the solutions are applied, as well as on the porosity of the paper. If the papers be immersed, much weaker solutions must be used than when they are salted by floating. If the paper is tolerably hard and floated, a solution of chloride of ammonium of about twelve grammes to the litre of water will answer. The sensitising solution should be about eight times this strength. But experiments will have to be made in order to see the proportions that best suit the particular sample of paper that is employed.

C. ROSE says that he has made some bromide paper by a formula that has been given for rapid plates, and cooked the emulsion for the same time. He complains that every sheet he has exposed yields flat pictures. The image flashes out directly the developer is applied, although in some cases he has reduced the exposure to one-third that he gives with a rapid commercial paper. Also that the image does not keep on the surface, but appears more as it is in a negative. There are two sources for the trouble; one is, that the emulsion is far too sensitive, very much over-cooked—an emulsion that, if applied to glass, would be very slow, on paper would be very rapid. The other is, that the emulsion is far too rich in silver. Very little bromide of silver is necessary in the emulsion when it is applied to paper for positive pctures.

P. O. P. writes: "Will you, through the medium of your columns, tell me of auything that will stop the toning of the gelatino-chloride priuts, when in the washing water, that will not also be injurious to the print? I find, on toning a batch of the prints, considerable allowance must be made for after-toning, as the toning continues until the prints are quite blue even thongh they are placed in constantly running water. Of course, if all were toned at one time, we could allow for this; but, in toning a quantity, some must of necessity wait longer than others, and so tone further in the washing water. If you can give me any assistance, you will oblige."—There is nothing that will immediately arrest the toning action without injury to the print but removing the solution from the print. This can be done by washing the print under a strong stream from the tap. In practice, however, if the prints have to remain long before fixing, allowance is made by slightly under-toning them in the first instance.

THE PHOTOGRAPHIC CLUB.—March 23, Last Lantern Night of the season. March 30, Smoking Concert.

THE Blackfriars Photographic and Sensitising Company have issued a Purse Camera, which, as implied by the name, packs up in form of a purse. It is not intended to compete with cameras of the usual class.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Technical Meeting, March 22, 8 p.m., exhibition of old silver prints. Mr. Dallmeyer will show his telephotographic lens. Mr. Chapman Jones on *Copying Inclined Pictures.*

WE are sorry to hear of the death of Mr. Henry Newton, of Liverpool, which occurred on Saturday last, after an illness of six months' duration. Mr. Newton was one of the oldest photographic dealers in the country, and was much esteemed in the trade, and by a large circle of friends.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—March 24, *Continental Photographic Institutions and their Influence*, Mr. W. H. Harrison. Mr. Warnerke will take the chair, and exhibit his lantern slides bearing on the subject. 31, *Photography on Wood.* By W. S. Rawlings. April 7, *Collodio-Bromide Emulsions*, Mr. Alexander Mackie.

MESSRS. HOLMES, SADLER, & HOLMES writes: "In your reply to 'Sined,' in 'Answers to Correspondents,' March 11, you say, 'So far as we are aware, Mr. J. J. Atkinson is Seavey's sole agent.' Please note that we are agents, and claim to hold the largest stock of any English house. Messrs. G. Mason & Co., of Glasgow, are also Seavey's agents."

WE understand that Mr. Gambier Bolton, recently attended at Windsor Castle, and presented to the Queen five framed photographs of dogs in the Royal kennels, the Egyptian ass, presented by Lord Wolseley, and the celebrated champion short-horn bull, "New Year's Gift," recently sold from Shaw Farm, Windsor Home Park, for one thousand guineas. Duplicate copies of these will be hung in the Camera Club Members' Exhibition during the approaching conference.

CONTENTS.

THE BRITISH
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GLASS POSITIVES AND FERROTYPES WITH GELATINO-BROMIDE.

Although the glass positive seems to have sunk out of mind with the wet-collodion process, while its more modern imitator, the ferrotype, finds its principal patrons amongst seaside excursionists and the like, there is no possibility of denying the beauty of the results obtainable in skilful hands by either of those methods; and there are in existence at the present time specimens of the collodion positive, or "ambrotype," as it was called in America, the work of one or other of the "old masters" in collodion, which would put to shame, for quality, very much of the work turned out with all our modern advantages, and which, in their delicacy of gradation and beauty of colour, are scarcely distinguishable from Daguerreotypes.

Of course, it is scarcely needful to say that there were positives *and* positives, and that, though the best workers were able to turn out specimens that would vie with the results of any process past or present, still a great deal of the work scarcely passed mediocrity, while another very considerable portion would have been better had it never appeared; and, unfortunately, it is on the inferior results that the reputation of the process now chiefly rests. But, even granting the superior quality of the work it is possible to execute, it may be asked what benefit is to be gained by reviving the glass positive, even if it could be satisfactorily achieved with gelatine films.

The reply is not difficult, especially from a professional point of view. There are very many people who would go to the expense of a single portrait but who do not care for, or have no use for, more, especially if that one could be finished and taken home at once instead of their having to wait a week or two "for proofs." It is true that so far as the single picture is concerned the difficulty is surmounted by some of the professionals who cater for the humbler classes. These gentry will supply a single *carte-de-visite* or even cabinet portrait at a price little in excess of what used to be charged for the glass positive or ferrotype, but no one who knows anything about the cost and labour of production will believe that such work can be well and honestly executed, to say nothing of its artistic quality. Now, a glass positive, on the contrary, can be well and fairly executed for a small sum, and the artistic quality of course depends solely upon the executant.

Even to the amateur the glass-positive idea is not without its recommendations. Who amongst our amateur readers is not blest with friends—friends innumerable—who would rejoice in being photographed "without the bother of going to a regular photographer!" The "regular photographer" has got himself disliked by his generally autocratic manner, but chiefly, as far as we can gather, from his habit of screwing his victims' heads up in the "rest." So at least they say, and of course we cannot suggest that his necessary fee forms any objection to him, but certain it is that the amateur could secure unlimited customers either from the abolition of the head rest or else of "all fees." The good-natured amateur soon finds this sort of thing a tax upon him, not perhaps so much in a pecuniary sense, for he is bound to ride his hobby, but on account of the labour it entails upon him. The production of the negative is the least onerous portion of the duty, it is the after-demand for prints that constitutes the grievance. Now, if he were to institute the system of "reproducing" his friends in the form of glass positives, there is practically an end of the trouble. He has the amusement and pleasure of his hobby, and, at the same time, of conferring an obligation, and he gets the matter out of hand at once without any after-anxiety in the matter of prints.

But then arises the question, Can I make glass positives on gelatine plates? Well, so far as ordinary gelatine plates are concerned, it is generally supposed to be impossible; but there are films on the market now, in the form of ferrotype plates, we believe, which are specially prepared for positive purposes. However, after all, it is not quite impossible to utilise many of the ordinary commercial plates, and to produce results which, if they do not equal the best examples of collodion positives, are at least good enough to pass muster in very respectable company.

What is wanted first of all—and this is important—is a plate that will develop without any sign of fog or veil. In this respect the positive, to be viewed by reflected light, is even more *exigeant* than its congener, the transparency, in viewing which, by transmitted light, a slight veil may be imperceptible. Not so with the positive by reflection; the very faintest veil destroys the brilliancy of the picture irretrievably. This first condition is almost necessarily followed by another, namely, that the plate must be a comparatively slow one. This is not only because the more rapid plates are so seldom perfectly free from fog or veil, but because, with an extremely rapid plate, it is, in the highest degree, difficult to prevent the sensitive surface being more or less affected by light in the deepest shadows, and consequently the contrast and brilliancy requisite are not obtainable.

With many of the slower kinds of plates already in the market there is, however, very little difficulty in securing a good result if a little care is taken. It is, as already noticed, usually supposed that a special plate is necessary; perhaps, to obtain the best results, or to get ordinarily good ones with as little trouble as possible, a special plate may be desirable, but a very great deal may be done with an ordinary plate if special means be taken.

In the first place there is the matter of exposure. In the old collodion days, the exposure of a positive was much less than that given for a negative under similar conditions. But

this is scarcely the case with gelatine. A sufficient exposure must be given to allow the high lights of the picture to develop up to a certain degree of density before the shadow details begin to gather strength. If the exposure is too much curtailed, the lights will come up slowly, and, in pressing the development to get out the finer details, the plate becomes veiled; if over-exposed, the shadows fill up before the lights have attained vigour enough. The rule, then, is—more so than in the case of a negative—absolutely correct exposure, no "latitude."

Next, everything depends upon the colour of the deposit, and this, in turn, on the development. The stronger the developer, as a rule, the darker or more unsuitable will be the surface colour of the deposit; and, conversely, the weaker the solution—so far, at least, as the actual reducing agent is concerned—the lighter or more "silvery" will be the tint, although, of course, different plates or films vary very much in this respect. For instance, plates in the preparation of which potassium bromide has been used show, as a rule, whiter or lighter images than those prepared with ammonium bromide, and films containing iodide usually exhibit a tendency in the same direction. Thus it may happen that, while one plate requires a one-grain pyro solution to give a fair result, another may give a better image with three grains, though this is not a very common occurrence with modern plates.

Of the different developers, the choice lies between pyro, eikonogen, and the newest addition, para-amidophenol. Hydroquinone, when used in sufficiently dilute solution, is so slow in action as to be placed practically *hors concours*, unless, indeed, it be combined with caustic soda, in which case it is difficult to get the necessary clearness. In using pyro it is, of course, almost, if not quite, absolutely needful to employ sodium sulphite, otherwise the yellowing action of the developer upon the gelatine will inevitably detract from the beauty of the resulting image, if it do not altogether spoil it. A slightly "creamy" tint is by no means an objection, but rather an improvement, but the colouration produced by pyro is widely removed from that shade. With sulphite of soda, however, the pyro-developed image possesses a creamy whiteness and brilliancy combined that can scarcely be equalled—certainly not excelled by any of the newer developers. It also, under the most favourable conditions, exhibits a collodion-like "bloom" or tint, that is entirely absent from eikonogen or phenol-developed images.

The strength of the pyro, for most of the plates of the class we have mentioned, need not be greater than one grain to the ounce, the alkali remaining the same as for a normal negative exposure, and the bromide being, if anything, slightly increased. The alkali may be either ammonia or carbonate of potash, but under no circumstances carbonate of soda, on account of the yellow colour it produces. Potash gives possibly a whiter image than ammonia under all or any circumstances, but under specially favourable conditions the better, or rather the very best, results are obtained with ammonia.

The exposure, as already stated, should be ample, but not too long, and the development should be continued until the details of the shadows are clearly visible, but not long enough to tint the deepest shadows themselves. If this occurs before sufficient vigour has been obtained in the details, or if the high lights should come "heavy," it will be necessary to use more bromide, or better still, if applied with judgment, a drop or two of a ten-grain solution of bichromate of potash, which has a very powerful clearing action. Another expedient of the same kind which, from the few trials we have made of it in this as well as other connexions, consists in adding to the developer, instead of bromide, a similar quantity of sulphate of copper, the action of which is as follows:—As development proceeds, and the silver bromide is reduced, bromine is liberated, which combines with the alkali of the developer to form bromide of ammonium, or potassium, as the case may be, both of which are restrainers, and nothing more. In the presence of the copper salt, however, these, if formed, are at once robbed of their bromine, bromide of copper being formed; and this salt is not only a restrainer, but a destroyer of the latent image. By the use of sulphate of copper in the manner suggested, we may then start development without any restrainer—for the copper salt is comparatively, if not wholly, inert—and in proportion to the progress of development so is a powerful restrainer formed, which at a certain point will arrest development altogether. This is a capital plan for treating over-exposure, but must be used with great care. It is only applicable with pyro, and succeeds best when ammonia is used.

Development with eikonogen and para-amidophenol presents no features to distinguish it from pyro, except in the character and colour of the image. The same rules hold good, namely, weak developer, well restrained, and a good exposure.

MOISTURE AND HEAT IN CARBON PRINTING.

In a previous article on the effect of moisture in carbon tissue (see page 162, *ante*), the importance of its hygroscopic condition was fully explained, in so far as it referred to sensitiveness and keeping qualities. There is, however, another point in connexion with carbon printing where the presence or absence of moisture is an important element in the process. We refer to the so-called "continuating action of light." This somewhat remarkable property was noticed by the very earliest workers of the process. It is now tolerably well understood by most carbon printers, whether professional or amateur, that if a carbon picture is not developed as soon as it is printed it gradually gets deeper, notwithstanding that it is preserved in the dark. Hence, if prints have to be kept for some hours before they are developed, they should receive less exposure than if they were to be finished off at once.

For some years this progressive action was denied by some writers on the Continent, while here it was as strenuously affirmed. It is now, however, universally recognised everywhere, and great advantage is taken of it by professional printers to obtain large numbers of impressions from a given negative in short time during the winter months. For a long time, however, after the property was fully recognised, but little use was made of it, because of its apparent uncertainty. Sometimes it was found that the partially exposed prints would gain as much in a few hours as they would at others in days.

It was afterwards noticed that, when the printed tissue was freely exposed to the air, the action was always more rapid than when it was stored in an air-tight case. This fact was well exemplified in a series of pictures—one half of each having been kept under the two conditions—shown by the late Mr. J. R. Sawyer, in illustration of a paper he read before the Photographic Society some fifteen years ago. A couple of years or so after this, Mr. E. W. Foxlee, in a paper he read before the then South London Photographic Society, demonstrated that the continuating action was entirely dependent upon moisture, and, if that were absent, it was completely arrested. By thoroughly drying the tissue after exposure, and then sealing it up in an air-tight case, prints were kept for six

months which, when developed, proved to be no darker than corresponding ones that were developed immediately they were taken from the frames. Heat also, in conjunction with moisture, was shown to be a considerable factor in the case, as it greatly accelerates the action.

If a carbon print be given, say, one-fourth the normal exposure, and is then kept in a damp atmosphere, at a temperature of about 80° Fahr, for an hour or so, it will, on development, prove to be quite as dark, and equally as good, as one that has been fully exposed in the first instance; whereas, had it, instead of being made damp, been dried and kept dry, it would have gained nothing with even many months' keeping. This shows, in addition to what was said in the previous article, what an important point is hygroscopic condition in carbon printing.

Let us now consider how this particular element, in reference to the continuating action, applies in every-day practice. Suppose the tissue is obtained ready-sensitised, and in the proper state for use. If it happens, however, to be printed in a frame the pads of which are slightly damp, moisture will be absorbed from them. Therefore the print, if kept for a few hours, particularly if the temperature is warm, it will turn out over-printed, while another print, produced under precisely the same conditions, so far as exposure and time of keeping are concerned, but with perfectly dry pads, will be exactly right. Again, supposing the prints, when taken from the frames, are exposed for long to the atmosphere of the work-room, and that is humid, as is generally the case where the development is conducted, the darkening action will progress rapidly, and they will prove over-printed, and thus necessitate a prolonged development. Want of attention to, or lack of knowledge of, these matters fully accounts for many of what have been termed the "uncertainties" and "vagaries" of carbon printing, and much retarded its practice, when a few years ago it was surmised by some that it would entirely supersede silver printing. It has just been mentioned that the continuating action was for a long time denied on the Continent. This may, however, be accounted for by the fact that there the air is usually much dryer than it is here. Hence the conditions pertaining were widely different.

Where carbon printing is conducted on a large scale, considerable advantage is taken of the continuating action during the dull winter months. The pictures are partly printed, and then kept in the dark until they become deep enough. But much more might be done in this direction than is, we believe, the case at present, inasmuch as the partially printed pictures are only kept under normal conditions as to temperature and humidity. The experiments referred to above show that, by increasing the moisture and at the same time the temperature, the effect that would otherwise take one or two days to obtain can be secured in the same number of hours. Yet, so far as we are aware, this system of quickly curtailing the exposure is not adopted commercially, though we do not know why. Perhaps, however, there are practical difficulties in the way.

As moisture, coupled with temperature, are such important elements in the carbon process, it would seem advisable to always keep a wet and dry-bulb thermometer suspended in the work-rooms. If this were done, it could be seen at a glance the hygroscopic condition of the atmosphere, as well as its temperature. Such a thing would often prove of assistance to inexperienced workers.

The Large Sun Spot.—Among other photographic achievements is a sun-spot photograph, taken between February 8th and 18th; for it beats the record, being the largest spot photograph since the observatory began the series in 1873. The spot is nearly a hundred thousand miles across, and it is anticipated that it will again come into view after being carried by the sun's rotation round his farther side.

The New Star.—Most of the newspapers of the day have given us articles of more or less value upon the new star lately discovered in the constellation Auriga, and photos, spectroscopic and otherwise, have been produced by various observers. Father Denza, at the Vatican Observatory, adopted the plan of slightly moving the telescope in declination between each exposure, and thus obtained five images on each of the two negatives he obtained.

Photographing Medals and Coins.—We might, in connexion with this subject, refer to the photographing of medals and coins. Those who have attempted it are aware of the great difficulty there is, even with perfectly new subjects, in avoiding the appearance in the negative of numbers of fine scratches, though they be almost invisible upon the coin itself. The effect is produced by the unequal reflection of light being reproduced by the photograph, while to the eye the flood of light drowns them. To make the most successful negatives, the method adopted by those who make a business of this kind of work is to make a plaster of Paris reproduction, and take the negative from it instead of the original. Every detail is reproduced, and all irregularities of surface vanish.

Modification of the Platinotype Process.—At the Camera Club Conference, on Tuesday last, Mr. W. Willis read a paper on *Some Recent Improvements in Platinotype*, in which he announced that he had succeeded in producing a paper which allowed of development at ordinary temperatures. Beyond the fact that the platinum is in the paper in this modification, and that the ordinary oxalate bath is employed as usual, Mr. Willis did not, and, of course, naturally, give any details as to the means chosen for achieving the result. He, however, claims for the new paper that it gives pictures finer in grain and line than the old hot-bath paper, and, from the appearance of the specimens which he developed at the meeting, the claim seems well founded. The subject excited considerable interest among those present. For further details we refer our readers to our report of the Conference.

Gold and Silver in Sea Water.—It has long been known that silver and gold are constantly to be found in sea water. Lately, paragraphs have appeared in the press relating to such presence of gold (and other metals), and referring to a patented electrolytic process for obtaining the metals. Mr. Sonstadt, whose paper on the subject, published many years ago, and which is presumably referred to, writes to the *Chemical News* to say that he never said that he found a grain of gold per ton, and that what he did say was that there was less than a grain. He now damps the ardour of would-be "residue savers" by saying that the quantity is very much less than a grain, and is so small that, though he can prove its presence, he has not been able to estimate his quantity. We are afraid that nitrate of silver and chloride of gold will not be cheapened by the produce of the sea, though, at the rate the former metal is coming down in price—viz. 5½*d.* having been a common quotation for some time past—we may expect a material reduction in price in many sensitised media.

Photographing Small Solid Objects.—The best method of photographing a series of small solid objects arranged in certain order is not very familiar, and an article on the subject appears in *La Nature* last week, which may seasonably be brought before our readers' notice. The plan consists in placing the objects upon a table or other flat surface, and then photographing them either by means of a camera placed vertically or else horizontally, with the lens supplied by a reversing prism, or, which would be cheaper, a reversing mirror. The latter method involves an amount of expenditure which

in many cases the photographer would not care to undertake, but *La Nature* pictures a simple apparatus that would not be costly, and would be useful for many purposes. The camera rests on a support carried by two uprights of plain deal, which are attached to the sides of a plain table, the top of which is made of a sheet of glass. The objects are placed upon this glass and light reflected from below, to form a suitable background, from a board covered with white paper, and placed at an angle so that any depth of light can be given by varying its position, or the white paper may be replaced by a suitable grey. This is an important part of the arrangement, for it sometimes happens that the whole success of the negative depends upon the background being of suitable depth. Without the glass a complete re-arrangement of the objects would be necessary if it were found that a colour chosen were too dark or too light. It is, further, obvious that it would not suffice to place the coloured paper immediately below the glass, as then the objects would throw shadows which might interfere with their outlines, although to a certain extent this might be obviated by the use of "ground glass." Objects of spherical shape which might give trouble by rolling are kept *in situ* by means of a spot of yellow wax.

Light-Sensitiveness of Phosphorus. — It has long been known that phosphorus, in some of its modifications, is sensitive to light; but in an article recently published in *Nature*, over the signature of A. E. Tutton, we find an amount of sensitiveness described that is rather unexpected. Phosphorous oxide, in the white, wax-like solid form in which it usually condenses after distillation, is, he states, remarkably sensitive to light. Thus, "ten minutes' exposure to bright sunshine suffices to turn it bright red, and after half an hour it is rendered dark red." The red matter that gives the colouration he finds to be the well-known red modification of phosphorus, but even after several months' exposure it does not exceed one per cent. of the weight of the oxide. The beautiful isolated crystals obtained by sublimation *in vacuo* appear to be unaffected by light; but it is a curious fact that if one of them be melted by the warmth of the hand, and the liquid globule afterwards suddenly cooled to the wax-like form, the latter becomes red, as in the former instance. There are not yet sufficient data to enable the chemical changes undergone in this experiment to be predicated. The phosphorous oxide thus experimented with has not been at all fully dealt with in the text-books on the subject. Mr. Tutton states that it is quite a mistake to suppose that, when phosphorus is burnt in a combustion tube in a slow current of air, the lower oxide, and not phosphorous pentoxide, is produced. Scarcely a trace of phosphorous oxide is obtained under these circumstances, the white amorphous powder deposited being pentoxide. It is only when the current is at all rapid that phosphorous oxide commences to be formed. Full particulars are given as to the mode of production in the article we are referring to. Those of our readers who would care to follow up this most interesting subject we refer to *Nature* for March 10 last, pages 44 *et seq.*

RATIO OF GRADATION.—II.*

So far I have attempted to show that, even accepting Messrs. Hurter & Driffield's results and deductions, they do not greatly interfere with the preconceived notions and daily experience of photographers. We are accustomed to talk a great deal about latitude of exposure and development, but in ordinary every-day practice these are not greatly strained, certainly not beyond the bounds which the experiments of these gentlemen allowed for. We may, by variation in development, make very thin or very dense negatives from similar exposures, but it does not follow, nor does it appear likely from a careful consideration of all the circumstances, that the ratio between those gradations is in any way altered.

But now it remains to be considered whether or not it is possible, by *any* modification of development, to control or alter the gradations; I mean, of course, by resorting to abnormal variations, or very wide departures from the regular practice. I am inclined to argue that it is possible, though even there I am placed in a difficulty, in not being fully acquainted with the details of the original paper. For instance, looking at the effects of reversal of the image, or the production of a negative from a negative by a prolonged exposure, will there be no alteration in the ratios of gradation of two images, formed by extremely extended exposures, and developed by widely different solutions? Again, is it not possible, by the use of excessive quantities of restraining bromide, by the addition of gallic acid, bichromate of potash, or a dyad bromide, as suggested by Mr. Phillips, to so alter the gradation? I certainly think so.

But we must keep in view the fact that Messrs. Hurter & Driffield deal mainly, if not wholly, with the change of density of gradations produced by one developer, while the practical photographer concerns himself rather with producing, by means of one solution, additional gradations that another solution is incapable of rendering, or with suppressing some of the superfluous energy of a developer too powerful for a given exposure. Messrs. Hurter & Driffield may say, and possibly they are correct, that, while it is perfectly possible for the practical man to do this, the gradations which remain within the common reach of both solutions—which are, in fact, neither added nor suppressed—still remain in the same ratio to one another. It may be so, but, in the light of one or two experiments I will detail, it does not seem so to me.

The accurate measurements of the relative densities of different portions of a half-tone negative, whether portrait or landscape, is far from an easy matter to an ordinary photographer without special apparatus, but any one with the aid of a graduated scale can arrive at a tolerably approximate comparison of the results produced by different forms of development. The scale I have constructed for the purpose of this trial consists of twelve tints, formed of varying thicknesses of the fine paraffined paper sold for wrapping purposes. The range of tints is beyond what any one plate and developer will reproduce satisfactorily; that is to say, if one end of the scale is perfectly rendered, two or three, or perhaps more, of the tints at the opposite end will be either not rendered at all, or will present one even density. I have purposely arranged that this shall be so, in order to allow full scope for the developer in either direction while I work with the central portion of the scale as representing the correct gradation obtainable under ordinary or normal conditions.* It may be as well to observe that I do not claim, either for the scale or for my method of procedure, any pretensions whatever to scientific or mathematical accuracy; they are simply arranged for the purpose of somewhat roughly illustrating my argument.

At the outset I ascertained, by means of several exposures, the conditions under which, employing a certain developer—which for my purposes may be called the standard—the central portion of the scale could be rendered in correct gradation, or, at least, as representing a series of varying tints, clearly distinguishable one from the other. These were found to be, using a rather slow film, an exposure of ten seconds, at a distance of three feet from a paraffin lamp, the developer employed being a "one-solution" of para-amidophenol hydrochlorate, with sodium carbonate. Under these circumstances, which I call normal, the result was that the first three tints were practically undistinguishable, but from that point up to the eighth, inclusive, the gradation proceeded regularly. The ninth tint was barely visible, but so faintly as not to be worth consideration. The effective scale, therefore, consisted of six tints.

Next, a series of extended exposures was made, to try the possibility of securing a normal result from over-exposure and modified development. The most marked effect was obtained with an exposure of seventy seconds, others varying only in degree. With the strip of film developed with the normal developer, only the four highest tints showed any appreciable difference, from one to nine taking a uniform

* Since this was written, I have received, through the kindness of Mr. Alexander Cowan, a copy of Messrs. Hurter & Driffield's original communication, from which I find that they have, in their experiments, varied the conditions of development, both as regards time and composition of solution, to a far greater extent than I had supposed, though still within the bounds of what may be considered ordinary development. My intention in this article was not to question the accuracy of their deductions from one of the most ably conducted and elaborate series of experiments ever carried out in connexion with photography, but rather to open new ground, which, from a hasty perusal of their paper, I think I have done, though in an imperfect manner.—W. B. B.

* The scale was constructed the full width of a quarter-plate, so that a single plate could be cut up into strips for treatment with different developers, or could be exposed in successive strips for varying times, if it should be desired to try the effect of different exposures under the same development. The tints are numbered from the lowest or most transparent on the scale.

density, ten, eleven, and twelve showing comparatively little difference one from another, the whole four tints, in fact, being very weak. The other strip was developed with alkaline pyro, the solution containing the ordinary proportion of pyro, a large proportion of bromide, and a minimum of ammonia, the exact proportions of each being, to the ounce, three grains of pyro (with twelve grains of sodium sulphite), five grains of potassium bromide, and half a minim of strong ammonia. With this feeble action, and at the same time well-restrained solution, the development was continued until the twelfth tint was barely visible, the whole image being then so feeble that there appeared to be no gradation at all. Meanwhile, standing ready in a minim measure, was a concentrated solution, which, when added to the developer, brought its strength up to twelve grains of bromide and a minim and a half of ammonia to the ounce, the pyro remaining the same. Under the action of this more energetic solution, the lower tints rapidly began to gain density, and the application was continued until the gradation of the highest tints was discernible by reflected light. Upon fixing and examining carefully, the separate tints were clearly distinguishable as far down the scale as number five, after which the remainder assumed the same density, although at times, and in certain lights, it seemed possible to detect a difference between four and five. I will, however, be satisfied with claiming eight distinguishable tints, or an improvement of four over the normal development of the corresponding slip.

Now, it will be noted that this result gives two more tints than were obtained with the normal exposure, which resulted in six only; but the interval covered by the latter—in other words the "contrast"—was considerably greater than in the case of the over-exposures. Comparing the two over-exposed slips, the density or opacity of the lower tints of the restrained development was notably greater than in the densest portions of the other image, and at the same time the highest tints were decidedly more transparent. In fact, the increased number of tints was accompanied by considerably augmented contrast, although in this latter respect the result was inferior to the normal plate.

W. B. Bolton.

A NEW DRY-PLATE FACTORY.

Pleasantly situated on the outskirts of Cricklewood, and facing the pretty open country of Dollis Hill and Edgware—a district which is as yet hardly disfigured by modern building operations—are the new premises of the Imperial Dry-plate Company. For the purpose to which these premises are to be devoted, the situation could not be more desirable. The erection itself is a neat structure, in harmony with its surroundings, and should the meadows in its vicinity be one day covered, as seems possible, with villa residences, the inhabitants will have no cause to complain of that unsightliness or other drawbacks usually associated with manufacturing premises.

If the process of making dry plates, as generally employed nowadays, presents few of the terrors and uncertainties of which the makers of ten or a dozen years ago stood in constant dread, the necessities of competition demand that facilities for their preparation should be of the completest and, indeed, of the most scientific nature, since it is chiefly upon the perfection of the mechanical arrangements involved that commercial success can, in these times, be hoped for. In these respects we believe that the Imperial Company will be at no disadvantage whatsoever, especially when taking into consideration the fact that the guiding spirit of the enterprise, and the one upon whom the direction of the fitting up and equipment of the new factory has devolved, is Dr. J. J. Acworth, in whom many of our readers will recognise an old contributor to these pages, while others within a smaller circle know him to be experienced in both the theory and practice of gelatine emulsion-making, as well as a chemist and physicist of considerable attainment.

On the occasion of a recent visit to the Imperial Company's works, we were shown, under the guidance of Dr. Acworth, the principal parts of the premises set aside for the preparation of the plates. Commencing with the glass-cleaning room, we observed that the glass is cleaned by immersion in hot water. It is then, after draining, passed on to a drying room, the temperature of which is uniformly maintained at 85°. When it is dry it is placed in boxes, and is sent up by means of a lift to the coating room. Here we witnessed the coating of several dozens of 9½ × 6½ plates by means of a Cadett's coating machine. So soon as the plates receive the emulsion they are slowly carried, over water and under glass, to an employé who receives them at the end of the machine which is several feet long. When they reach his hands the emulsion is set. After the plates have been examined against the non-actinic light for evenness of coating, they are stacked in wooden racks, and are then ready for drying.

The operation of drying is conducted under conditions differing from those which we have generally seen employed for the purpose. Instead of a specially provided drying room, having the requisite rack accommodation, drying chambers are used. These are just so many long, narrow cupboards, capable of being closed in. The racks holding the plates are placed in them, and by a simple mechanical arrangement movable from the outside, the racks may be passed through from one end of the chamber to the other. The chambers are, of course, maintained at a uniform temperature, and their great advantage is, that, in contradistinction to ordinary drying rooms, no one has access to them, and thus the dissemination of particles of dust is minimised, if not practically avoided altogether. At the end of the drying chambers the plates are received for examination and packing, the arrangements for which were shown to us.

We did not witness any of the actual operations connected with the preparation of the emulsion, but we were shown the rooms in which the finished emulsion was cooked, this being conducted in steaming boilers. We also saw the room devoted to the washing of the emulsion, the arrangements for which are on a workmanlike scale. In the coating and other dark rooms the light employed is a very agreeable variety of orange, by no means trying to the eyes. In addition to the departments described, the premises include a carpenter's shop, and, of course, an engine and boiler-house. The engine is a three horse-power, by Hindley, and, looking at the amount of work it does in driving and heating, we must regard it as a very valuable member of the staff. A considerable section of the factory is devoted to the sensitising of albumen paper.

Dr. Acworth tests his plates in the camera, and, in addition to a laboratory devoted to the general purposes of the plate-making, has provided himself with a handsome and well-appointed private laboratory for experimental purposes, in which he hopes to carry out a great deal of photo-chemical research and investigation. The task of superintending and setting the factory in working order has fallen entirely upon his shoulders, and, if the success of the Imperial plates may be foretold from the arrangements entered into for their manufacture, a happy issue should await the venture. We gather that emulsion-paper coating will be undertaken at a future date, for which, as well as for other purposes, considerable spare space is available.

CAMERA CLUB CONFERENCE.

The Conference week of the Camera Club opened on Monday last with the annual exhibition of members' work, which was on view at the Club Rooms. The exhibition is of a non-competitive character, while we believe that the pictures are not required to pass the ordeal of a committee of selection. These facts, to our thinking, afford the best scope for gauging the collective skill and merit of the general body of the Club's members, which, in the present case, we are happy to pronounce as high. The Camera Club has the advantage of numbering among its members many of the foremost photographers of the day, of whose works an excellent selection is shown. Messrs. P. P. Cembrano, H. P. Robinson, J. Gale, and Henry Stevens are represented by some of their most familiar and characteristic pictures; Mr. A. H. Dresser by some clever seascapes taken with a hand camera, and Mr. Gambier Bolton by a small but happy series of animal studies. Mr. H. M. Hastings' interiors are sound in technique, and we were pleased with the thoughtful landscape work of Messrs. Guardia, H. E. Davis, Darcis, and others. The portrait studies are few, and some of them betray high artistic treatment. Of course, at a Camera Club exhibition, one expects to meet with examples of the newest style of focussing, and at that now under notice there is no room for disappointment. In the unnamed collection of frames, which our acquaintance with the peculiarities of his work warrants us in attributing to Mr. George Davison, there is material for considerable controversy on this point, although it would be impossible to deny his keen artistic instinct. On the whole, the exhibition, which is to remain open for several weeks, will more than repay inspection, although it may not be completely convincing to thick-and-thin admirers of the "old school" pure and simple.

THE PRESIDENT'S ADDRESS.

The theatre of the Society of Arts was well filled when Captain Abney rose to deliver his opening address. In this, after referring to the Brussels Congress which was held last year, he said that the report of Mr Warnerke and himself, the English delegates on that occasion, was only

ust out, so that it was difficult to tell to what extent the standards agreed on would be adopted in this country where the inch and the grain were deeply implanted. Despite M. Lippmann's experiments of last year, photography in colours had not made much advance, and his opinion was that in the present state of our knowledge the problem would only be solved in the very remote future. Lippmann's colours were permanent, but they were dependent on the length of exposure and not on coloured light. He (Captain Abney) had obtained different colours that way himself, but they were not pure spectrum colours. The results obtained militated against the reproduction of absolute colours such as were found in nature. The reason for this was simple. The colours might appear to the eye the same as fine spectrum colours, but such colours mixed would also give a percentage of white light. Mr. H. M. Elder had recently investigated the colouration of silver chloride by light, and had advanced a photo-dynamic theory of the change, and he and every one who had heard the paper had come to the conclusion that it was an excellent type of paper. It threw much light on the action which occurred, and had not received the attention it deserved from the chemical point of view. Mr. C. V. Boys had lately produced photographs of bullets in motion by the spark of the Leyden jar. Mr. Boys was a typical experimenter. After referring to recent discoveries in astronomical science by the aid of photography which proved that star magnitudes determined by the eye and photography agreed, the President touched upon the luminosity of feeble lights of various colours, and concluded his address by endorsing the movement in favour of the establishment of a photographic institute, and said it was as necessary as many kindred institutions. They must start in a modest way, not aiming too high at once, in a modest building, with a modest equipment and modest instructors.

CHEMIGRAPHIC ETCHING.

Mr. Leon Warnerke gave a demonstration of chemigraphic etching, remarking that the subject was not new. He said that photo-engraving processes were not so extensively practised in this country as they might be. The principle of zinc plate etching had been demonstrated by himself before more than once, by Mergert thirty years ago, and by Gaudin in 1873. Certain metallic salts were precipitated on a sheet of zinc, and a weak acid solution, which would not attack the zinc, was then applied, which acted where the precipitate was formed with evolution of hydrogen. The state of dilution of the acid solution was determined by the particular metal precipitated—with cobalt, a strength of 1:10,000 being sufficient; with other metals the solution could be stronger. The most powerful precipitant was nickel ammonium tartrate. Alkaline salts acted more powerfully than acid salts. The depth of the etching varied with different salts employed, nickel giving deepest results, and lead allowing the etching action to proceed very faintly, while with mercury the acid solution produced no change. He did not deem it necessary to enter into photographic details, as they were familiar to all; but before giving the demonstration, he would say that aluminium promised very well for etching purposes. It was a capricious metal, being insoluble in nitric and sulphuric acids, and easily soluble in hydrochloric acid or caustic potash. Nitric acid has no action on the bare aluminium, but if this were covered with a precipitated metal, the nitric acid acted on it very powerfully. This was the case where mercury chloride was used. Mercury chloride appeared to produce an amalgam.

Mr. S. B. Webber asked if the aluminium should be used rolled or soft.

Mr. T. R. Dallmeyer asked if Mr. Warnerke had experience of working on the surface of aluminium. In processes of photo-engraving, a considerable amount of work had to be done after the chemical action was stopped, which was left to the photographers. Pure aluminium was difficult to work.

Mr. H. M. Elder said Mr. Warnerke, in mentioning the action of mercury chloride on aluminium, had placed a new power in the hands of photographers. As to what the theory of the action might be of oxygen and acids on aluminium, he had always imagined that it had a thin protective film on its surface. A recent paper on the action of acids on zinc pointed out that the probable cause of the absence of action of dilute sulphuric acid was due to a surface of hydrogen formed on its surface. Such action was 700 times greater where the solution was contaminated with chromic acid.

Mr. Warnerke, in reply to the various questions, said, as regards etching, similar results were obtained with hard as with soft metal. As to working on aluminium, it was different to other metals. In cleaning for photo-engraving purposes, the process was much the same. For turning it did not behave very well, but turpentine, or any mineral oil, greatly facilitated working. There was no difficulty in using the graver.

RECENT IMPROVEMENTS IN PLATINOTYPE—A NEW COLD-BATH PAPER.

Mr. W. Willis read a paper, in the course of which, after pointing out that the effects of lowering the temperature of the developing solution in the hot-bath process reduced the chances of successful development, brought out defects in the paper, and gave a granular deposit of the image, he said that, in 1888, he had attempted to make a paper developable at ordinary temperatures. The cold-bath process, since brought out, had, however, been disappointing, and the hot-bath process had been found more generally useful. They could now develop at much lower temperatures than formerly, 90° being the limit reached. But failures often occurred, due to the low temperature, as rapidity of reduction varied with the different temperatures. He had recently discovered a method of preparing ordinary platinum paper so that rapidity of solution should not overtake that of reduction, and the image developed before the salts could be removed from the paper. For obvious reasons he could not make the process public, but development conducted at a temperature of from 50° to 70°—normal temperature—gave results equal to those obtained at 130°, free from granularity and other defects. The process had only recently been perfected, but it was completely under control. It might not please his friends of the new school, who did not want fineness of deposit; but more photographs depended for their value on the very quality which the modern school rejected. He showed a number of graduated comparisons between the new paper and the old at various temperatures, the former being much superior in fineness of detail and clearness of line. The ordinary paper was developed at 130°, and the new at 56°. With the latter the ordinary oxalate bath or that containing ortho-phosphate could be used. Development of the new paper was slower than the old, thirty seconds being required before the action was complete. The addition of a small quantity of hypophosphite of sodium gave control of development. Mr. Willis then developed several pictures at a temperature of 64° Fahr. These were much admired. Development in sections failed to produce lines in the pictures.

Mr. Francis Cobb asked whether it was necessary to have three acid baths, as with the old process, and how long it was safe to work the oxalate bath.

The Rev. F. C. Lambert inquired if the improvement was applicable to sepia paper.

Mr. R. Keene presumed the paper required the same careful storage from air and moisture. Could the oxalate be kept up by adding to it?

Mr. J. Gale asked if rough-surface paper could be used with the process.

Mr. Tate asked when the new paper would be on the market, and its price.

Mr. R. W. Robinson inquired if it were possible to get warmer blacks, and if time of exposure had any effect.

Mr. Willis, in reply, said three acid baths were necessary. The oxalate bath could probably be used as long as with other processes, and the new paper should be looked upon as the same as the old. His experience had been very short, so that he could say very little about it. Over-exposure could be controlled by the use of hypophosphite, or a little ice in the water. With under-exposure the developer could be warmed. He could not say whether the process was applicable to sepia paper, as it was a difficult problem to dissolve. He gave an affirmative answer to Mr. Keene's questions. The process might be used with rough-surface paper. There was no difference in the colour produced by under or over-exposure, although blue-black was exceedingly easy to obtain. Immersing the paper in water before development gave a warm tint—almost like sepia.

PHOTOGRAPHY APPLIED TO MEDICAL RESEARCH.

Mr. Andrew Pringle prefaced his subject by alluding to Professor Meldola's recent lecture, in the course of which he pointed out the special branches of science to which photography rendered notable services. He (Mr. Pringle) thought the Professor should have given more prominence to the services rendered by photography to medical research. To no special line of research had photography rendered such notable service as to medical research and treatment. During the last two or three years many new installations had been started in the medical schools for the purpose of recording the causes and appearances of diseases by the invaluable and trustworthy means of photography. It was important to have photographs of patients in disease before and after treatment, and photography was useful in cases where sketches could not be made, as, for instance, in a disease of the tongue. The flashlight was very useful in the hospital wards, results being obtained with it that could not be had by the ordinary means. In photo-micrography there was an idea that it was necessary to have expensive lenses. He showed a slide of a blowfly's tongue taken with one of Mr. Crouch's student lenses from a two-thirds object glass. The photo-micrograph was as good as any done with much more expensive instruments. Slides could be coloured to the natural tint by M. Lumiere's formula, which he (Mr. Pringle) had experimented with and published. For students, photo-micrographs of unique specimens were of great value, especially as they were now able to show slides on the screen of the same colour as the students saw them in the microscope. Incidentally he mentioned that the carbon process for this purpose was inferior to gelatino-bromide plates. Mr. Pringle's discourse was interspersed by a great many photo-micrographic slides bearing on its various points, at the conclusion of which he claimed that in photography medical science had a most useful adjutant. He thought they should do all they could to assist the medical profession by means of the science of which some of them made a profession and others a hobby.

At the evening meeting, Mr. Van der Weyde described his earliest attempts at applying electric lighting to portraiture and the development of his own methods, and concluded by taking portraits of Captain Abney and Sir George Prescott, using the apparatus at the meeting which had been roughly set up for the purpose; and Mr. E. J. Humphery exhibited the working of a globe lamp for portraiture, also the lamp adapted for printing purposes (platinum and silver), in which magnesium powder, hydrogen and oxygen under pressure, was employed as before. It had, however, been improved, so as to *print in four or five seconds*, actual platinum prints being made and developed by the "new" cold developed paper.

Mr. H. E. Armstrong then read a paper on the *Theory of Development*, the discussion on which, on the suggestion of the President, was adjourned until a future meeting of the Camera Club, inasmuch as the paper contained matter which required consideration.

WEDNESDAY'S PROCEEDINGS.

At the meeting on Wednesday afternoon Mr. J. B. Spurge exhibited his safety gauge, and said that, in order to render safe from explosion the gauges that are employed for indicating the pressure of gas contained in the cylinders employed with the lantern, he would exhibit Clarkson and Spurge's improvements for that purpose. Their improvement consisted, he said, in filling the interior with a fluid that is practically incompressible, thus preventing access of gas to the gauge; consequently there is nothing allowed within that can possibly explode, and danger from that source is entirely avoided.

He also described some improvements on his sensitometer, in the direction of constant times of exposure, and concluded by exhibiting results tending to show that, in opposition to Messrs. Hurter & Driffield's theory, negative gradations could be changed.

A PAPER ON PARADOXES.

The paper on *Paradoxes of Art, Science, and Photography*, by Mr H. P. Robinson, was read by Mr. George Davison, the Hon. Secretary. In it the author, on his own admission, tried to make the paper as intangible and contradictory as art itself, an object in which he succeeded most admirably, as will be seen from the paper, which we give in another part of the JOURNAL.

Mr. J. Pennell said Mr. Robinson's lies were extremely amusing. He told lies without knowing it, although he did not mean to. The biggest lie of all was when he said impressionists had produced nothing worth seeing. Velasquez, Raphael, Titian, and, in fact, all great men were impressionists. Their impressionism was their way of looking at things. Art was intimately connected with science, because artists went about their work in a scientific way, although they hid the fact.

Mr. A. Maskell said no doubt Mr. Robinson's paper would alarm his admirers. He was hardly serious, although he had given them a series of delightful paradoxes delightfully expressed. He hoped his own pictures on the Camera Club walls were not the least untruthful there.

Mr. E. J. Humphery thought that some day they might come to regard Muybridge's pictures as both artistic and truthful. The truth was what appeared to be truth at the time.

Mr. P. H. Newman said Mr. Robinson had himself demonstrated what truth was. Art had to do with appearances, and not facts, and Mr. Robinson had been dealing with appearances that afternoon.

The President objected to the term "scientist," which he hated, and he considered Mr. Robinson had prostituted the English language in using the term. He (the President) would rather be called a tomfool than a scientist. He had no pretension to art, but as Mr. Robinson had had his fling at science, he (the President) thought a response was demanded of him. Mr. Robinson had not treated science with respect. What was truth? Truth in art was something totally different to truth in science. As a scientific man, he was bound to say that, if you analysed the works of artists, it was wonderful how scientifically incorrect they were. Perspective had improved, owing to photography. Artists had painted moonlight pictures of mountains hundreds of miles high. That was not truth, and science proved the falsity. Photography was invented by science, and art would not have had any truthful characteristics but for science. When painters wanted information about their pigments, to whom did they go? Not to artists, but to scientific men. Artists could not do without science, and never would. The longer they lived, the more highly civilised would they become, and the more art would depend on science, and the more artists would have to paint according to the dictates of science.

USES OF PHOTOGRAPHY TO THE DECORATIVE ARTIST.

Mr. H. H. Stannus next delivered a discourse, in which he pointed out the various applications of photography to decorative purposes. With reference to the hanging of photographs, he saw no objection to their being hung with oil paintings, rather the reverse. They should be hung at the level of the eye. With pictures and photographs hung together, the colours mutually helped each other. He objected to classification, and preferred small pictures under large ones, in the style sometimes adopted with paintings. The charm of photographs was their quietness of tone. For filling up windows photography offered an admirable field, but he did not think it could yet compete with the brush of the artist or the productions of the colour. On textile fabrics the detail was lost, and the absence of a variety of colour was a drawback. Photography was, as they knew, of great use in draughtsmanship for enlarging or reducing. Adverting to the discussion as to what was truth, he said truth need not be ugly. Science was a matter of fact, and art of appearance. He regretted to hear untruthfulness defended by a photographer, and said that retouching should always be acknowledged. In archæology and architecture photography was of much service; and for travelling students the camera was a great help. He advised photographers to take their architectural views to scale by putting a two-foot rule on some part of the picture, and also always to carefully note the aspects of buildings for future reference, and concluded by recommending the establishment of a record office with photography to supply the material.

Mr. Robinson said that in his paper he had referred to picture-making, in which they did not want facts. He objected to two-foot rules in his pictures, which he only estimated from the point of view of their pictorial qualities.

Mr. Francis Cobb thought photography was not untruthful until high art had made it so. Mr. Stannus should go to the Astronomical Society and ascertain what was being done in the securing of a truthful record of the heavens—the most truthful thing yet accomplished.

Mr. P. H. Newman said artists were undoubtedly much indebted to photography, and agreed with Mr. Stannus in his suggested arrangement of photographs and oil paintings together. It was difficult to arrange photographs in a small room, as he had pointed out elsewhere, and he regarded Mr. Stannus' ideas on the subject as a valuable continuation of his own.

Mr. W. S. Bird said that it seemed to him that the difference between art and science was that one appealed to the emotions and the other to the intellect.

Mr. Maskell suggested the leading of transparencies as in stained glass windows, and also the application of large photographs to walls. He also thought that, in laying foundation stones, photo-micrographic records on china plaques would be practically indestructible. They could easily be enlarged by some future discoverer.

THE DEBT OF ART TO PHOTOGRAPHY.

Mr. Henry Blackburn was the next speaker, and he cheerfully acknowledged the services of photography in reproduction processes, and its uses in daily illustrated journalism. He thought that photographs of Carlyle still extant represented the man and the historian better than Millais', Watts', or Whistler's portraits. Artists did not like photography, although they employed it. He quoted instances where photographic enlargements had formed the bases of spurious oil paintings, and he placed this fact to the debit of photography. The subject of the Muybridge pictures had cropped up again that afternoon, and he would endeavour to settle it once for all. He and several friends once went out coursing, to compare notes as to the impression produced by a travelling hare, and they agreed that the appearance of the extended limbs of the hare during an isolated moment of time was a mere impression. The animal, as it were, floated—as they saw it. He appealed to Mr. J. Pennell, as an illustrator of books, to make his drawings more suitable for photographic reproduction.

Mr. J. Pennell said that it was not the fault of photography that his drawings were criticised, although he found that no Englishman could reproduce them so well as foreign firms. He complained of the paper which was used in the press.

Mr. H. G. M. Conybeare pointed out that, in viewing the movements of animals, the eye had a tendency to see what it wished to see.

Mr. P. H. Newman said that the faculty of perception which artists had was of advantage in considering the truth or otherwise of such pictures as Muybridge's.

Mr. T. R. Dallmeyer was of opinion that both artists and photographers, when producing distant objects, conveyed the sensuous impression, but that photography, when applied to near objects, failed to do so, and in this respect it was inferior to painting.

The Rev. F. C. Lambert pointed out the important part which heredity had in the impressions of objects produced on the mind.

The Conference concluded with the reading of a paper by Mr. C. H. Bothamley on *Some Points in Connexion with Development*, which briefly dealt with Messrs. Hurter & Driffield's theories, Mr. Bothamley's opinion being that those gentlemen had not proved their case.

The annual dinner of the Club was held on Wednesday evening at the Monico Hotel, over a hundred members being present. Captain Abney presided. Among the toasts were the Club, proposed by Mr. Henry Blackburn, and acknowledged by the Chairman; the Visitors, replied to by Mr. H. Van der Weyde; and the Photographic Press, acknowledged by Mr. J. Traill Taylor (THE BRITISH JOURNAL OF PHOTOGRAPHY), Mr. H. Sturmey (*Photography*), Mr. E. J. Wall (*Amateur Photographer*), Mr. W. Welford (*Photographic Review of Reviews*), and Mr. J. Hay Taylor (*Optical Lantern Journal*). Music and recitations enlivened the proceedings, which were kept up till a late hour.

THE POSITION OF STEREOSCOPIC PHOTOGRAPHY IN REGARD TO BEAUTY AND UTILITY.

[Glasgow Photographic Association.]

When asked to write a paper for this meeting, it struck me that I could not do better than introduce a discussion on a subject which occurred to me during the exhibition lately held in our city, and which has often been in my mind since, viz., to inquire into the reason for the great revival of stereoscopic work among the photographic fraternity.

There are several classes of men who photograph; and, setting aside those who employ photography as an agent in scientific research, I think they may be divided into three classes. There are those—chiefly professional—who photograph for monetary gain, and they do stereoscopic work because an eager public desire to buy stereoscopic photographs to entertain their friends in the drawing-room. This is business, and it were treason to criticise the great Mammon God of the Briton.

Then, there are those—mostly amateur—who photograph because they desire relief from the monotony or worry of their daily avocations, or because they have much leisure and require some hobby to occupy their time and thoughts, and they find in the manipulation of cameras, plates, papers, and solution, a satisfactory outlet for their energies. These hail stereoscopic work as a delightful variety, and naturally become enthusiastic over it. They re-photograph all their old views, and, as they show the results to admiring friends, they expatiate on the marvellous reality of the appearance, how everything stands out, and how, were the objects but coloured, the observer might imagine himself to be looking at the actual scene through a binocular. The admiring friend acquiesces, and remarks, "What a wonderful thing science is; do you think photographs ever will be be taken in colours?" This class photograph for the pleasure they derive from the manipulation. It is a harmless and interesting amusement, and they might readily be much worse employed.

Then, there is a third class of camera men, who photograph because of the results. Some like to have a picture record of the places they have visited to remind them of a happy holiday, and to illustrate their public or private lecture to less fortunate brethren who stayed at home; and there are some who use the camera because through it they can acquire lasting impressions of much that is beautiful. Their albums contain notes of nature in all her moods; a wave, a cloud, the outline of a hill or tree-branch fixed by the camera is ever a pleasure to them to look at. They may or may not enjoy the manipulation, but the real end of their work is the album, not the dark room. Their object I consider the noblest, and it is from their standpoint that I wish to examine stereoscopic photographs to-night.

In the first place, I submit that it is impossible to appreciate the artistic qualities of a photograph, be it ever so fine, through any mechanical contrivance. Imagine an artist painting a picture of a view which he looked at through a telescope! To enjoy a work of art, the mind must be untrammelled by anything outside of it. To me this is the initial objection to the stereoscope. The disturbance created by the necessary fixing of the parts, getting a proper light, adjusting the focus, &c., is a source of irritation which effectually prevents the calm enjoyment of the beauty of the picture. In the second place, I submit that, after going through the trouble of fixing the instrument, the result is not beautiful. It may be interesting to see once, but it is not beautiful, and that for various reasons. I shall probably be told that the parts stand out and take their proper position in the plan of the landscape, that it looks natural and real, and that it must, therefore, be more beautiful than a flat surface could possibly be. With this I entirely disagree. That the parts stand out, I admit; that they appear real, to have solidity, I deny. Of course, I can only speak of the results as they appear to me; and, as I can see no reason why they should appear different to others, I take it for granted that what we severally see in looking into the instrument is approximately the same impression. Instead of having the appearance of natural objects with bulk or solidity, stereoscopic pictures always remind me of stage scenery painted on flat surfaces and set behind each other at short intervals. The reason for this impression is obvious. In nature it is impossible to see objects near at hand and objects at a distance in focus at the same time. In the stereoscope, however, the several planes are all seen in focus at once, and thus the effect aimed at by one means is directly annulled by another, with the result, as I have stated, that the various planes seem flat portions, separated only by a little space from each other.

At a casual glance, one is apt to think that it is necessary to alter the focus of the eye to see different objects in the stereoscopic picture, but more careful observation will show that this is not the case. The mind can only concentrate itself on one object at a time; but, if an endeavour is made to look at a near and distant object together, it will be found quite possible to do so. From a scientific point of view, it is obvious that, as the photographs are flat surfaces, the focus of the eye must be the same for all parts of the picture.

In judging an ordinary photograph, one of the chief points to be considered is, to what extent the feeling of atmosphere has been introduced into it. Painters devote their most earnest endeavours to convey the atmospheric impression in their pictures, for well they know that it is on the much-maligned atmosphere of our island that so much of its beauty depends. Now, the stereoscopic picture is absolutely devoid of all atmosphere, and must, therefore, be false and untrue to nature.

I have tried an experiment over and over again, and, as there is a stereoscope here, I would like you to try it also, and see whether you agree with me in the result. Look at a photograph in the instrument carefully, note all the glaring hardness, and the persistent manner in which every object seems to be calling out, "Look at me, I am standing out, I have no connexion with anything behind; you may have thought that I was on a flat surface, but look, you were mistaken; I have really no connexion with anything behind." Then, when you have noted all this, shut one eye, keep it closed, and you will find that it is really a very beautiful photograph at which you have been looking. The tree in the foreground has a lovely form, and the mass of stems behind blend into a delicious softness as they disappear behind each other in the distance.

The stereoscopic effect is an endeavour to imitate nature, while the object of an ordinary photograph or drawing is only to reproduce an impression of nature. The failure of the stereoscope in its greater aim is more marked than the less ambitious, but more practical, endeavour to reproduce on a flat surface an impression of what we see.

I contend, therefore, that stereoscopic photography, considered from the æsthetic standpoint, is a failure, that the stereoscope is only a scientific toy—and a false one at that—calculated to interest without either pleasing or satisfying. The truth of the axiom, "The boy is father of the man," is as clearly demonstrated in photographic matters as in any other department of life. When tops are "in," no schoolboy who has the slightest regard for propriety would dare to be seen with marbles in his possession, and six weeks later, when "tip-cat" is in vogue, tops have no interest for him whatever. In photographic circles at present stereoscopic work is "in," and I do not expect that anything I have said will affect the business of the maker of stereoscopic cameras and stereoscopes in the slightest degree.

As regards the utility of stereoscopic photography, I think that is confined to the instrument-makers and dealers in photographic material.

J. Craig Annan.

PARADOXES OF ART, SCIENCE, AND PHOTOGRAPHY.

[Camera Club Conference.]

"Stick to nature, my boy!" is an admonition often heard among artists, yet it is most true that, beyond a certain point, the closer the imitation is to nature the further it is from art.

Art is not so much a matter of fact as of impression; even realists admit this. Their objections to what is called impressionism is that the impressionists seldom say anything worth saying, and sometimes nothing at all, leaving a shrewd suspicion that they have nothing to say, and glory only in having no mission except to upset the experience and practice of centuries.

No possible amount of scientific truth will, in itself, make a picture. Something more is required. The truth that is wanted is artistic truth—quite a different thing. Artistic truth is a conventional representation that looks like truth when we have been educated up to accepting it as a substitute for truth. The North American Indian did not understand a portrait less than life size, or a profile with one eye only; he was not educated up to the convention.

Of late years there has been a great demand for truth in art, whatever that dark saying may mean. We have been impressed by the literalists to be faithful to nature. To quote Mr. Oscar Wylde, "They call upon Shakespeare—they always do—and quote that hackneyed passage about Art holding the mirror up to Nature, forgetting that this unfortunate aphorism is deliberately said by Hamlet in order to convince the bystanders of his absolute insanity on all art matters," reducing genius to the position of a looking-glass. On the other hand, it is sometimes said, perhaps jokingly—for we should not take Mr. Brett or Mr. Pennell too seriously—that photography cannot be art because it has no capacity for lying. Although the saying is wrong as regards our art, this is putting the semblance of a great truth in a coarse way. In other and more polite words, no method can be an adequate means to an artistic end that will not adapt itself to the will of the artist. The reason is this, if it can be reduced to reason. Admit that all art must be based on nature; but nature is

not art, and art, not being nature, cannot fail to be, more or less, conventional. This is one of those delightful contradictories that make the study of art an intellectual occupation. Men naturally turn to nature. We have evidence of this from prehistoric times. The ornament of all time, of all nations, with scarcely an exception, has been based on nature—the Greeks and Moors are the important exceptions—yet the ornament that approached nearest to exact imitation of nature has always been the most debased and worst. It is the lowest intellects that take the most delight in deceptive imitation. Mr. Lewis F. Day puts this very admirably in one of his recent publications:—"Those who profess to follow Nature," he says, "seem sometimes rather to be dragging her in the dust. There is a wider view of nature, which includes human nature, and that selective and idealising instinct which is natural to man. It is a long way from being yet proved that the naturalistic designer is more 'true to nature' than another. It is one thing to study nature, and another to pretend that studies are works of art. In no branch of design has it ever been held by the masters that nature was enough. It is only the very callous student who opens his mouth to swallow all nature, whole; the older bird knows better."

It is clear, then, that a method that will not admit of the modifications of the artist cannot be an art, and therefore is photography in a parlous state if we cannot prove that it is endowed with possibilities of untruth. But they who looking, perhaps, only at their own limited experiments, say photography cannot lie, take a very narrow view and greatly underrate the capabilities of the art. All arts have their limits, and I admit that the limits of photography are rather narrow; but, in good hands, it can be made to lie like a Trojan. However much truth may be desirable in the abstract, to the artist there is no merit in a process that cannot be made to say the thing that is not.

Here I am bound to admit a considerable weakness in my argument. We are told by a writer in a popular new magazine, edited by a member of our Club, that it is "always the best policy to tell the truth—unless, of course, you are an exceptionally good liar!" This is, indeed, a misfortune, for there is not, I am ashamed to say, very great scope for sparkling mendacity in our art. That is to say, we cannot produce brilliant falsifications, such as the painter may indulge in. One man may steal a horse, while another may not look over a hedge. A painter may unblushingly present us with an angel with wings that won't work, while a photographer is laughed at, very properly, if he gives us anything nearer an angelic form than that of a spook raised by a medium.

It must be confessed that it takes considerable skill to produce the best kind of lies. It is in the hands of first-class photographers only—and perhaps the indifferent ones—that photography can lie. With the first, possibly, graciously; with the latter, brutally. The photographers of only average attainments, and such as we should get turned out in quantities by an art-less Institute, seldom get beyond the plain, naked, uninteresting truth. Yet I think that many will agree with me that the very good and the very bad are much more interesting than the mediocre. That the best are interesting is clear; that the worst are often the cause of a good laugh is the experience of all; it is only the middling good that induce indifference.

There can be little doubt that, in this respect, and looking at it from this point of view, painting is a much greater art than photography; but what I am concerned to prove is that, although photography is only an humble liar, yet it is not the guileless innocent that some people suppose, and has a capacity for lying sufficient to enable it to worthily enrol its name among the noble arts. Nay, is it not the greater for its humility? Photography gives us the means of a nearer imitation of nature than any other art, yet has sufficient elasticity to show the directing mind, and therefore is the most perfect art of all. If we must have paradoxes, let us carry them to the bitter end.

"Let us have truth," says the conscientious writer who knows not what truth is. What should we get in art if we could capture it? We should have a representation of nature as we see it in a mirror, colours and all, and should tire of it as soon as the novelty wore off. The worst thing that could happen to photography as an art would be the discovery of a process giving the colours of nature—the one impossible thing in nature, I hope and believe. Its one great deviation from faultless virtue is, as I have endeavour to show, that it is more truthful than painting.

A writer innocent of the resources of the art, and wishing to depreciate it, make a point of the photographer having no control over the action of the developer so as to produce the variation from nature he desires. I can only reply that among my own pictures there is scarcely one that does not owe a good deal of any merit it may have to control of the developer. The possibilities of control were greater, perhaps, in the collodion process than the gelatine, but we are speaking of the capabilities of photography, not of any particular process. The scientist may prove, beyond any possibility of doubt, that the relative values cannot be altered in development, but the photographer knows that variation in development varies the appearance of his results, and that should be quite enough for him. It is so difficult, and yet so tempting, to "find out what cannot be done, and then to go and do it!"

I feel serious promptings here to have a fling at science that will surely bring down the wrath of our President on my unfortunate head. I will try to ameliorate him by saying that science demands our greatest respect. No one can have more reverence for science than I have myself—when it keeps its place. But we are suffering from science, and fancy is dying out of the land. It is doing serious harm to photography as a picture-producing art. When a student ought to be studying the construction of a picture, and developing in his soul the art of lying, he is led away by the flickering *ignis fatuus* of science, and goes mad over developers. "Another new developer" has more effect on the tender feelings of the brethren of the camera than would the advent of a poet-photographer. This suggests a variation on Rejlander's *Two Ways of Life*. One youth travels along the pleasant and virtuous walks of art, not listening to the Sirens of Fact; but dozens of others are decoyed to the worser way, and are soon lost in the seductive vanities and subtleties of science. They last long enough, perhaps, to modify a developer—with which science, however, tells them they can do little or nothing—and are heard of no more, except in the multitudinous platitudes used in the endless discussions of abstractions in society papers; and the scientific dream of the future is an Institute of Photography from which Art is to be excluded. Art will be very glad to part company.

Let us be generous and admit that Science has its good points, but it is doing a good deal of harm in the world. It is robbing us of our illusions. The science of History has defrauded Richard III. of his hump, made Henry VIII. a moral character, and gone audaciously nigh to proving that Jack the Giant-killer never existed. We are bored by the tedious papers of those who "have not the wit to exaggerate nor the genius to romance," and a synonym for dulness is a lecture at the Royal Society. But scientists are not without their hilarious moments. In our own Art I cannot help thinking that scientists are trifling with a serious subject when they tell us that we cannot do as we like with our developers, or when they bring logarithms to bear on picture-making. But the humour is not all on one side, and we not unfrequently enjoy a smile at the prodigious engines they sometimes use to crack our poor little nuts.

What has science to do with art, except to provide materials for its use? It is only of late that art has, on the one hand, been made to depend on absolute scientific truth; and, on the other, by the same writers, been proved, in the case of photography, not to be an art because it cannot deviate from truth. It is merely an incident, an accident, a detail; call it what you will, that science, sometimes of the highest and most distracting kind, is connected with picture-making photography. The science that deals with the nature of the image, or the calculation of the curve of a lens, is a very distant cousin indeed to picture-making by the use of photographic materials. The use of materials invented by others for a definite purpose can scarcely be called science. No scientific theory should be allowed to have weight with an artist who has practised his art successfully for years, and knows what he wants and how to get it. If, for instance, I was told that it was proved by science that the negative would not yield all the tones of nature, I should reply that many years' practice had convinced me of that well-known fact, but the mere circumstance of it being proved scientifically did not alter the facts, or further limit the tones. When it was proved scientifically to Diogenes that he could not walk round his tub, that humorous philosopher settled the matter by walking round that desirable residence. I am afraid I have used this illustration somewhere before, but let it pass. In art, the artist sees his results, and it is for him to judge, from his knowledge of art and nature, *not science*, whether his results are true, or, at any rate, if they lie properly and are what he wants. The artist has to do with appearances, the scientist with facts. It is not enough to say this is not true. The question is, Is it true enough for artistic purposes?

I have alluded to development once or twice. Two very clever scientists, whom I much respect, Dr. Hurter and Mr. Driffield, have proved to everybody's unsatisfaction that photographers have no control over the gradations; but this does not alter the fact that—to put the simplest case—he knows when a negative is over or under-exposed, or developed too dense or too thin to properly represent his idea of nature as far as in him lies, and his art will allow. Then

there has been another great attempt made to show that the perspective of photography is not scientifically true. If the attempt was successful, which is very doubtful, *Who cares?* It has been true enough not to be found out for fifty years, and that is good enough for photography. Can it have been the want of truth that has unconsciously compelled artists since the beginning to admire the truth of photographic prospective, and rely on its veracity? Here is another paradoxical nut to crack.

But my business is not to make a feature of the truth of any part of photography. On the contrary, I want to clear its character of the unartistic virtue of being nothing but a truthful, inevitable, stupid purveyor of prosaic fact.

Painters sometimes trust to us for truth; the Law Courts are becoming more wary, and appreciate our deviations. I was once found fault with by an artist for "altering" a photograph, on the plea that it would mislead a painter if he wanted to copy it. I found he *had* copied it before he saw the scene, and when he afterwards compared his picture with it, he found a clump of trees that should have appeared on the left transferred to the right. I had made the alteration by double printing, and improved the composition. *I did not* want a mere local view. I don't know that there is anything more exasperating than for a painter to take it for granted that it is a photographer's business to play jackal to his lion, and hunt up food for him; but it is a blessed truth that we *can* deceive him if we like. Painters ought to be more grateful to us than they are. Besides providing some of them with subjects, we have taught them what to avoid—educated them on the Spartan and Helot principle—and art has vastly improved during the half-century of our existence. We have made the column and curtain background absurd. When our art was born, painters thought nothing of violating perspective by placing the horizon as low as the feet of their portraits, and made no difficulties about hanging heavy curtains from the sky, and we are still fulfilling our useful mission of showing artists the ridiculous things they ought not to do, but it is asking too much to provide subjects for them—idea, composition, and detail. A painter should never use photography until he is capable of getting on without it, and then he should make his own photographs. To copy another man's work is not honest, and is a lazy and mischievous method of attempting to make a living.

I am afraid I have filled my space without giving as many specimens as I could wish of the possible delinquencies and untruthfulnesses that art requires and photography can accomplish; but I hope I have shown that, if it cannot lie like paint, it has the merit of approaching it in mendacity.

I will conclude with another illustration of the capabilities of our art for useful falsification. I once knew a photographer (it sounds better to put it that way) who was employed, for the purposes of a Parliamentary Committee, to make a series of photographs showing that one place was much more picturesque than another. Some ugly gas-works were to be erected, and it was desirable to place them on the least beautiful of two spots. It may be also mentioned that it was likewise necessary that they should be placed on the site that best suited the promoters. Both places were very picturesque, but in the photographs it was easy to see the one site was a little rustic paradise (with suitable figures and fine skies), and the other a dreary desert, all foreground of the plainest! Yet both were true to fact, and they had the intended effect.

In conclusion, let me express the pleasure I feel in being afforded the fascinating opportunity of saying a few humble words in praise of lying in a room which has been saturated with truth and fact for more than a hundred years—ever since, indeed, Barry "restored the antique spirit in art" by painting his anachronisms on the walls, and from which building emanates the prospectus of the Chicago Exhibition, which honours our art with the crowning paradox of classing photography with Instruments of Precision. H. P. Robinson.

ON THE PRESERVATION AND DETERIORATION OF GELATINE NEGATIVES.

Perhaps within the whole range of one's photographic experience there is scarcely anything which causes more annoyance and regret to a careful worker than to find that, after all the care bestowed in the production and subsequent proper storage of negatives, a deterioration or decay, sure and certain in its action, will set in, and over which there is no control.

Among the numerous forms of deterioration, perhaps one of the most annoying is that of the sudden appearance of spots or specks of varying shapes, and frequently of a dark brown colour, which, after a time, will change to a lighter tint, and eventually become almost transparent. These brown or yellow spots have from time to time given rise to a considerable amount of discussion, and various have been the opinions formed and expressed by experienced workers as to their cause. All seem, however, to agree that it is almost useless to hope for any success to attend any attempts to remove them when once they have taken root in a negative. Some workers have advocated a certain method of treating such flaws to a weak bath of cyanide, &c., as a means of getting rid of them; but such, I fear, is by no means a certain cure for this trouble, and in many other ways a very doubtful one, for the whole range of tone in the negative is almost sure to suffer when such a treatment is resorted to, and hence more harm than good is likely to result.

Intimately associated with the question of the deterioration of negatives is that of their preservation, and therefore we find the common practice resorted to of applying a coating of varnish or some other suitable medium, such as plain collodion, to insure the surface of the film against damage of various kinds. It has been claimed by some of our most experienced workers in photography that, once a gelatine film free from defects has received a coating of collodion, and then a further coat of varnish, that such is an absolute protection against all atmospheric influences, and proof against surface contaminations from such as damp printing paper, &c. I am afraid, however, those who hold these views claim too much—at least, it has not been so in my experience—and in the course of this article I shall be able to show and offer incontestable proofs that such a treatment is absolutely useless to ward off or prevent a certain disease or decay setting in on gelatine films on glass.

Doubtless, the common practice of varnishing negatives, as a precaution against certain injuries and accidents commonly met in with almost daily in every printing room, is quite a wise precaution against even such seemingly trivial matters as a drop of water or saliva from a printer's moustache; for, when any adhesion of the printing paper takes place with the negative film, it is an easy matter to remove the varnish, and get the plate recoated before any damage is done, and many a valuable plate has been saved by such an action taken promptly.

But there are numerous other forms of deterioration met in with in gelatine negatives which no coating of varnish seems able to prevent, and the knowledge of this has raised the question in many minds that, after all is considered, if it is not quite as well never to varnish. I know more than one worker whose hairs are grey with photographic experience who entirely discards varnishing in every way, alleging that such is quite likely to injure an otherwise healthy film, and do more harm than good.

For some years this subject has given me a good deal of thought, and I have studied somewhat closely the various forms of deterioration and flaws commonly met in with in gelatine plates, in the hope of being able to form a somewhat definite opinion as to their cause (at least, in some particular kinds of them), and, if possible, hit upon a remedy as a safeguard against such; and, perhaps in this more than any other phase of photography, the old saying holds good, viz., "To find out the cause is to effect a cure."

So far back as the year 1886 I began to give some thought to this subject, and I confess that I was among those who, on theoretical grounds at least, formed the opinion that, when a gelatine negative film was subjected to a coating of collodion and finally varnished, such was proof against all atmospheric influences. Before long, however, I had a rude awakening.

It transpired that in the summer of 1886 I had occasion to use some extra rapid plates, which were coated with an emulsion that was prepared by what is known as the ammonia process; these plates, I may say, were made under my own observation, and at the time yielded negatives, when developed with pyro and soda, that were all that could be desired—hence the extra precaution on my part to protect a good thing when I had got it. So they were straight away treated as follows:—

The films were first rubbed with a silk handkerchief, then coated with a plain collodion, and finally, on top of that, they got a good coat of spirit varnish. For a long time all went well, and not a single one of the batch showed any signs of deterioration, or spots or specks of any kind. During the winter of 1886 and spring of 1887 they were carefully stored away with other plates in mahogany, grooved boxes, placed in a dry parlour cupboard, and, so far as I could discern, were in no way subjected to any sudden change of temperature and damp. In the autumn of 1887, however, I had occasion to throw off a good many prints from one of these negatives, and all went well—no signs of spots or deterioration in any degree, and so the winter of 1887 passed. In the spring of 1888, however, judge of my disgust to find one of my pet negatives attacked by a disease in the shape of minute spots of a brown colour, and these had

the appearance of eating down into the film. It was quite evident a decay of some kind had set in, and had been progressing all the winter. My first thought was how to save the negative, and so I immediately set about removing the varnish by means of methylated spirits, thinking that by so doing I would get behind the spots. But here I was mistaken; the disease was deeper down, and had actually penetrated into the gelatine film through the coating of collodion.

This negative I now took especial care of, not as one ever likely to afford me much pleasure in the way of printing, but as one that would yield me some information and insight into the nature and behaviour of the insidious disease that had set in, and so I have carefully watched these spots from time to time and noticed their appearance under the microscope, in the hopes of being able to form some definite opinion anent them. One thing I had learned, viz., that no coating of varnish or collodion could be relied upon as a preventive of this form of decay or disease, which, to my mind, was clearly inherent in the gelatine film itself.

Spots or specks, and numerous other flaws which clearly come under the category of defects and deterioration, are, properly speaking, divisible into three classes:—In the first place, we have a certain kind of spots which are clearly traceable to the shortcomings of the plate-maker. Secondly, we have numerous forms of surface defects and stains that arise from sheer neglect and ignorance on the part of the worker. Thirdly, we have by far the most dangerous and insidious form of spots that are inherent in the film itself, and which, so far as I know, we have no power to prevent.

I shall treat of these latter defects first. When any one for the first time views through a fairly good microscope a gelatine negative, using, say, a one-inch power, they cannot but be forcibly impressed with the great beauty and evenness of the deposit of metallic silver which, on development, has taken the place of the sub-bromide of silver, formed on exposure of the plate to light. This metallic deposit varies, of course, according to the shadows or high lights of the negative; but the grain, when the film is in a healthy state, and not disturbed by any defect or decay, is always found to yield a beautifully even appearance of a dark grey steel colour, something like the grain seen in fine emery paper, the grain being beautifully even and free from all lumps and irregularities. The appearance of a portion of the sky, as seen when viewed through the microscope with a one-inch power, shows that the metallic silver is evenly distributed, there being no flaws or disturbing element present.

In my next I hope to refer to the altered aspect of the film when decay has set in.

T. N. Armstrong.

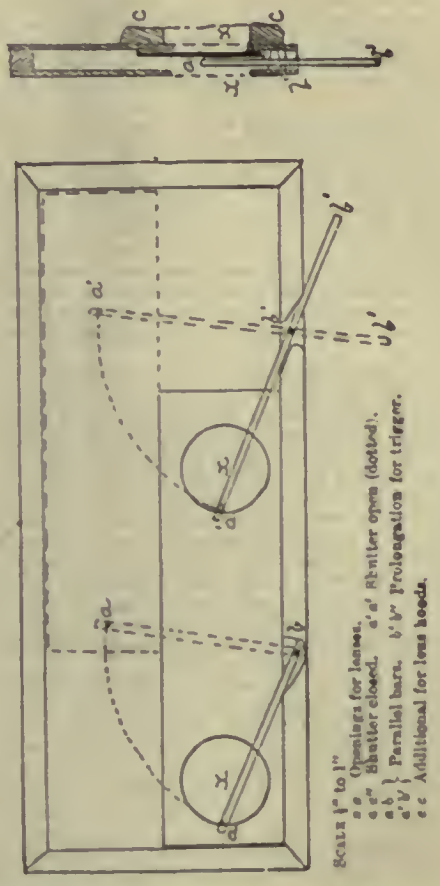
A STEREOSCOPIC SHUTTER.

Beyond the invariable *desiderata* common to every shutter there are one or two points specially requisite in one for stereoscopic work, one being absolute synchronism of opening, the other greater length of exposure to foreground than sky, the foreground objects being of such primary importance in a good stereograph. Both these points are difficult to obtain with the double cap, and a shutter is almost a necessity. One can buy lovely shutters, of course; but there are so many to whom every item of expense is important, that the description of a most effective and easily made shutter will be useful. I do not know if it is at all original—probably not. Consequently, if such a shutter has been described before, I hereby apologise. If it is any one's patent, I must ask the Editor to cremate this carefully. But I believe it is, at all events, new to many.

The diagrams will almost speak for themselves. It will be seen that the shutter consists as a whole of a back and front covering board perforated for the lenses, and that, in the space left between these back and front boards, works what is practically one blade of a parallel ruler, motive power being supplied by the extension of one of the bars, on which the "blade" forming the shutter proper is hinged. This shutter rises until the bars are just *beyond* the perpendicular, when the lenses are uncovered, and the shutter will remain open without attention, a touch of the "trigger" extension of the longer bar returning it to "closed." It will be seen at once that the exposure may be made pretty rapidly—quite enough so for any ordinary purpose, and as rapidly as any stereoscopic picture is likely to be taken.

The diagrams are drawn to scale half size. The one drawback, which, owing to the flatness and lightness of material used in a small one, is in the length of the whole shutter being slightly beyond that usual. The *material* of the shutter is of one-eighth of an inch (or less) cedar (say the useful cigar-box), the shutter proper being of the same. Parallel bars of brass or vulcanite. Except for the lens openings, and the one very small aperture necessary for the prolonged bar, the whole being enclosed, there is no difficulty or extra careful fitting required to ensure light-tightness. The lenses are attached by means of an extra half-inch wooden slip perforated to fit them, glued, or screwed to the back.

The diagrams are planned for a pair of rapid landscape lenses, mounted at the regulation three and a quarter inch centre. The parallel



bars *a b* and *a' b'* are pivoted at what are the most economical points, the pivots at *a* and *a'* on the moving portion being on the centre line at its intersection with a circle corresponding with the lens apertures. In making up the shutter the main points to be observed are that the holes in the bars *a b* and *a' b'* are at exactly the same distance. It is best to put one on the other, and drill the two simultaneously. The length of these bars is, of course, determined by the height to which the shutter is raised; but the distance between the points *a a'* and *b b'* must be exactly the same, or the shutter will not open evenly. In the plan the distances are three and a quarter inches.

The separation between the front and back boards is just enough to allow the shutter to work easily. As will be seen, the bottom slip of wood by which they are separated is recessed to take the parallel bars, the shutter therefore fitting closely to the back covering board and lenses, there is no chance of any stray light entering.

The shutter, with a few careful measurements, will be found very easy to make and very satisfactory in working. The foreground exposure is far longer than that for the sky, and may be of any duration. There can be no vibration, and the whole thing is very light, and costs a little trouble and some screws.

Rev. C. W. Whistler.

THE ACID ACTION OF DRAWING PAPER OF DIFFERENT MAKES.

[Chemical Society.]

In a communication to the British Association, *On the Fading of Water Colours* (*cf. Chemical News*, Vol. LIV. p. 263), I showed that moisture and acidity were the chief causes of the fading of certain pigments. The acid in the air of towns is produced from sulphor in the coal, in the air of rooms from the excessive amount of gas which is burnt, and in certain colours according to their mode of preparation. It was suggested that even the slight acidity of drawing papers might be expected to facilitate chemical change, the action in each case being a gradual one. I had experimented with various kinds of the best paper in use, both of

old and recent manufacture, and had come to the conclusion that such papers were invariably acid, even those of the most excellent quality. The fact was accounted for as follows:—The fibre of which the paper is made is steeped in dilute sulphuric acid, and the subsequent washing with pure water does not entirely remove the acid from linen fibre, of which the best papers are made. I have actually found fine linen to retain traces of acid after it has been steeped in frequently renewed pure distilled water for a period of three weeks. The acid seems to combine with the fibre, and the resulting compound is only slowly decomposed or dissolved by the action of water. Such linen gives a blue colour when an aqueous solution of iodine is dropped upon it. There was no intention to convey the idea that the paper contained free acid in such quantity that it could be easily removed by washing, or that it would affect *litmus paper*, which generally is not a sensitive agent. The samples of paper exhibited at the meeting were carefully tested in the following manner:—A pure and neutral solution of azolitmin, prepared from litmus, was allowed to drop upon the paper and soak into the fibres; the edges of the drops were then examined, and found to be red. The bulk of the liquid was then removed by a piece of the same paper, with the result that in every case a red spot was seen, which dried red. Another mode of testing was as follows:—A clear sable brush, washed in distilled water, was used for applying a wash of pure neutral azolitmin solution, as if it were a pigment; such washes turned red upon the paper.

Professor Church, in his valuable work on *The Chemistry of Paints and Painting*, published in 1890, remarks that he is unable to endorse my statement that the best drawing papers have an acid action. He finds, in fact, that sized papers are generally neutral to test-papers, and that inferior papers are more often slightly alkaline than acid.

As some doubts may be entertained as to the quality of the papers examined by me, it may be well to state that they were all of the best quality, most of them being of Whatman's make. That no question may arise on this point, I have tested the samples named below in three ways: first, by dropping litmus solution upon the paper; secondly, by washing with a sable brush; thirdly, by steeping strips of paper in pure distilled warm water, and testing the water for acidity, and also for sulphates. The acid action was recognised by a pure litmus solution, by an ordinary laboratory preparation, and by a carefully prepared solution of helianthin, though this last agent is not very sensitive.

The results are identical with such as I obtained on former occasions. The description of the samples and their actions is as follows:—

1. Whatman's hand-made paper, 96 lbs., old make. Washes, acid; drops, acid; water, decidedly acid. Large precipitate with barium sulphate insoluble in dilute chlorhydric acid.
2. Whatman's double thick imperial, 140 lbs. Washes, acid; drops, acid; water, decidedly acid. Large precipitate of barium sulphate, as with No. 1.
3. Whatman's double elephant, hand-made. Washes, acid; drops, acid; water, strongly acid. Large precipitate of barium sulphate, as with No. 1.
4. Whatman's hand-made, 72 lbs., 1887. Washes, acid; drops, acid; water, decidedly acid. Large precipitate of barium sulphate, as with No. 1.
5. Saunders's hand-made. Washes, acid; drops, acid; water, decidedly acid.
6. Hollingworth's machine-made paper. Washes, barely acid; drops of strong litmus, neutral in colour; water, very slightly acid, almost neutral.
7. Arnold's unbleached hand-made paper. Washes, acid.

No further tests for acidity were recorded.

All these samples were procured, especially for the purpose of these tests. It will be seen from these notes that there were good grounds for attributing an acid action to even the best of drawing papers. In other words, if a very sensitive solution of pure litmus be applied to paper in the same manner as a strong pigment, as, for instance, in delicate washes, the action is, in almost every case, distinctly acid; but, if a drop of a strong solution be allowed to sink into the paper and dry up, its colour may be so slightly changed as to appear violet, leading to the inference that the paper is neutral. The strength of the solution of litmus, and the manner in which it is applied, must therefore be taken into account, because the quantity of the purple colouring matter in contact with the paper may be more than sufficient to overpower the red tint caused by the acid present in the moistened material. It is, therefore, extremely probable that there has been no difference between the opinions of Professor Church and myself, but only an incomplete understanding as to the degree of acidity of the paper. Solutions of helianthin painted on the various samples of paper gave at first a pure yellow tint, which gradually changed to a colour intermediate between rose colour and yellow. Very dilute solutions, washed on freely, showed after some minutes a pale rose colour, mixed with a yellowish tinge.

A sufficiency of acid yields a fine rose tint with such a solution. Hollingworth's paper did not show in any degree an acid action with helianthin, although it gave a slight indication with litmus.

Discussion.

Mr. Wade remarked that perhaps the sulphate detected by Professor Hartley was derived from thiosulphate, which, it was well known, was used as an antichlor in manufacturing paper.

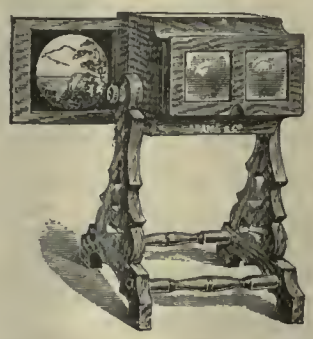
Mr. Groves said it would be desirable to know more of the history of the papers. Was gas burnt in the room in which they were stored, and were the sheets examined taken from the tops of the packets? If so, it was possible that the sulphuric acid was derived from the gas; it would be desirable to test the centre portions of sheets taken from the middle of the packet.

Professor Hartley's remarks on this criticism are as follows:—The circumstances are not within my recollection, and I am unable to make inquiry at present, but drawing paper in sheets is kept in drawers, at a height of not more than three or four feet from the ground, and carefully protected from dust and damp. As a rule, the samples tested by me have been taken from the middle sheets of sketch blocks prepared from Whatman's hand-made papers, and purchased from Lechertier, Barbe, & Co., Regent-street. Imperial and double elephant were the kinds most used. I am well acquainted with the effect of a sulphurous atmosphere on paper, but cannot think that the acidity to which I refer is to be attributed to such a cause. W. N. Hartley, F.R.S.

Our Editorial Table.

Adams's Binocular Pantascope.

Messrs. Adams & Co. (Charing Cross-road and Aldersgate-street) having now completed their Binocular Pantascope, we have been afforded an opportunity of examining it. As will be seen from the drawing, this pantascope is a parlour-table instrument for viewing



lantern slides by both eyes. In form it is elegant, and it is well made. Messrs. Adams make them in three styles: one for lantern slides pure and simple; a second and a third with a chromatrope attachment behind, by which the light passes through tinted media, and imparts effects of natural colour to the scene under examination.

This system of inspecting lantern views is so good, that it is certain to be generally adopted as an alternative to projecting them by the lantern, and a parlour table on a winter's evening will scarcely be complete without two or three of these instruments upon it. The better class of pantascopes have an ingenious arrangement by which small paper photographs also may be viewed.

The binocular pantascope sells at 25*s.*, 31*s.* 6*d.*, and 42*s.* respectively, according to the style.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 4943.—"Improvements in Photographic Burnishing Machines." Communicated by J. H. Smith. Complete specification. H. B. Barlow.—*Dated March* 14, 1892.

No. 4999.—"An Improved Magnesium Lamp." E. Wenig.—*Dated March* 14, 1892.

No. 5003.—"Improvements in Lamp Apparatus for Magnesium or Similar Lights." G. Nesbitt.—*Dated March* 14, 1892.

No. 5008.—"Improvements in or appertaining to Printing Plates or Blocks formed by Photographic Means." J. Hines.—*Dated March* 14, 1892.

No. 5051.—"Improvements in Folding Racks for Draining Photographic Plates." D. Allan.—*Dated March* 15, 1892.

No. 5056.—"Improvements in Adjustable Levels for Photographic Camera Stands, and for other Like Purposes." E. Martin.—*Dated March* 15, 1892.

No. 5132.—"An Improved Hand Camera." A. C. Smith and A. A. Smith.—*Dated March* 16, 1892.

No. 5174.—"An Improved Box for Optical Lanterns and the Like." W. D. Askew.—*Dated March* 16, 1892.

No. 5345.—"An Improved and Inexpensive Toy Photographic Camera." J. Gage.—*Dated March* 18, 1892.

No. 5479.—"Improvements in Photographic Shutters." Communicated by Bariquand and Marre. E. G. Brewer.—*Dated March* 19, 1892.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
March 28	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 28	Gloucestershire	
,, 28	Lantern Society	20, Hanover-square.
,, 28	North Middlesex	Jubilee Hall, Hornsey-road.
,, 28	Rossendale	Townsend-chambers, Rawtenstall.
,, 29	Lancaster (Annual)	Storey Institute, Lancaster.
,, 29	Leith Amateur	
,, 29	Warrington	Museum, Bold-street, Warrington.
,, 30	Bath	Roy Lit. & Sc. Inst., Terrace-walks.
,, 30	Burnley	Bank Chambers, Hargreaves-street.
,, 30	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 31	Camera Club	Charing-cross-road, W.C.
,, 4	Halifax Photo. Club	Mechanics' Hall, Halifax.
,, 4	Hull	Royal Institution, Hull.
,, 31	Liverpool Amateur	Crescent Chambers, 3, Lord-street.
,, 31	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 31	Oldham	The Lyceum, Union-street, Oldham.
April 1	Bristol and West of England	Rooms, 28, Berkeley-sq, Bristol.
,, 1	Cardiff	
,, 1	Croydon Microscopical	Public Hall, George-street, Croydon
,, 1	Holborn	
,, 1	Leamington	Trinity Church Room, Morton-st.
,, 1	Maidstone	"The Palace," Maidstone.
,, 1	Richmond	Greyhound Hotel, Richmond.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

MARCH 2.—Technical Meeting, Mr. J. Traill Taylor in the chair.

Mr. T. R. DALLMEYER described the new form of his tele-photographic lens, consisting of a 2 R patent portrait objective and a symmetrical negative combined. The advantages of this system over that which he had originally introduced were that correction for eccentrical pencils was obtained, and thus the field was flattened, while the power of using the back lens of the portrait objective corrected negative aberration. The full aperture could be employed for distant as well as near objects. He produced comparative pictures by Mr. M'Kenzie, of Glasgow, illustrating the powers of the tele-photographic lens.

The CHAIRMAN said they had elicited two important facts that evening, namely, that the telescope principle could be applied to existing Dallmeyer patent portrait lenses, and that a compound symmetrical back lens could be used instead of the Galilean eyepiece. He congratulated Mr. Dallmeyer on his improvements. Some present might wish to know, in reference to the large picture shown, what would be the difference between its definition and that of a picture enlarged to the size from a small negative.

Mr. DALLMEYER said the result would not be so sharp. With the tele-photographic lens they had been able to get details not revealed by an opera-glass.

Mr. E. Clifton exhibited Messrs. Beck's Frena hand camera, which takes forty cut films, lantern-plate size. In the frame were a series of notches, and between each film was a piece of cardboard having similar notches, so placed that the respective notches did not register. The mechanism was so arranged that after each exposure a film and a card dropped out of position. The film could be moved up to the moment of exposure, and thus a swing-back movement could be obtained.

Mr. R. G. Mason exhibited his new combined lantern and table microscope.

Mr. H. CHAPMAN JONES, referring to a misunderstanding which had arisen as to what he had said on a previous occasion in reference to copying on an enlarged plate, explained that what he did was to photograph a square, subdivided into smaller squares, on a sloping plate. The angle of this plate was 21°. In copying the picture equal size, the angle the negative was placed at was 21°. Thus the original angle required an angle of 21° to correct it. The scale of reproduction was proportionate to the various parts of the plate and the lens plane. The angles were purely accidental, and depended upon the distance of the plate from the lens.

A large collection of silver prints, made prior to 1862, and lent by Messrs. H. W. Foxlee, Colonel Mitford, F. R. Currey, J. Traill Taylor, F. Bedford, W. Haviland, E. Clifton, and the Photographic Club, was on view.

The CHAIRMAN said they would see from the collection that silver prints did not necessarily fade.

Mr. H. W. FOXLEE said his prints were produced under circumstances which, according to modern notions, should have conduced to their fading long ago. One feature had, perhaps, conduced to their permanence, namely, that the paper was strongly salted and highly sensitised, while the pictures were mainly printed under tunnel, which, in some cases, took many hours. Perhaps this toning contributed to permanency, because all that time fixing was going on. For the last twenty years his prints had been stored away as lumber. Some of the pictures had yellowed, but the prints were nearly all unaffected. With some similar prints kept under similar conditions, the yellow had gone right through the pictures.

Mr. W. ENGLAND thought fading was chiefly due to the fact that prints were not properly washed. He had, in fact, proved it to be the case.

The CHAIRMAN said he had had a fixed, but incompletely washed print in his possession for many years, which had retained its pristine vigour to the very last. Hypo did not necessarily act in a deleterious manner so long as the print was kept dry.

Mr. FOXLEE attached more importance to thorough fixing than to washing. He would rather have incomplete washing than incomplete fixing. Mr. Foxlee had fixed and dried prints, and placed them in hypo, without noticing any subsequent change. Some of his (Mr. Foxlee's) prints on the wall produced in 1862, had only been washed for two hours.

In closing, a vote of thanks to those who had lent the old pictures, the CHAIRMAN said nothing better than the latter was produced at the present day, either as negatives, ortho- or isochromatic effects, artistic compositions, or production of an optical tool.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 17.—Mr. J. Traill Taylor in the chair.

Mr. W. Bouts was elected a member of the Association.

A question from the box asked whether, with wet plates, a forty-grain bath was better than a thirty-grain bath for line work, and was a plain iodised or bromo-iodised collodion to be preferred?

The CHAIRMAN observed that in such a case great crispness and a considerable degree of intensity were wanted. The usual way with those photographers who worked reproduction processes was to develop the negatives clearly, and intensify with mercury and ammonium sulphide. He thought a thirty-grain bath would do. A final intensification with potassium cyanide and silver cyanide gives great intensity.

Mr. A. L. HENDERSON advocated a twenty-grain bath. Weak baths gave the same intensity as strong ones. The method mentioned by the Chairman was practised at Southampton.

In reply to a question, "What are the advantages of a bioular lantern, and in which way is exact centering effected when effect slides are shown?" Mr. T. E. FRESHWATER said the only advantage was that one got a change of pictures by dissolving instead of pushing them through. In some respects, as compared with a single lantern, it was at a practical disadvantage. The cheapest way of effecting the centering was to have two pieces of glass carefully fitted into the frames and have lines drawn on them, and make the two discs to register. It was a very simple way, but wanted careful consideration in measuring up and adjusting; but it was not absolutely necessary, as they could have two front lenses of the same focus, and make the two discs coincide. For many effect-slides, they must have a triple lantern. Continuing, Mr. Freshwater said that the Association wanted a gas regulator for its lantern, and he was pleased to say that Mr. R. R. Beard had presented one to the Association, which he (Mr. Freshwater) had brought with him that evening.

The thanks of the meeting were voted to Mr. Beard and Mr. Freshwater.

Mr. James Martin's ice-crystal photograph being exhibited, Mr. A. COWAN asked whether any salts were in the water. The crystals did not look like pure ice crystals.

The CHAIRMAN remarked that water, in freezing, ejected all foreign matter.

Mr. A. HADDON said that was so. Faraday dissolved some chlorine in water, and froze it, and found the water resulting from the liquefaction of the ice crystals absolutely free from chlorine. It was possible to use frozen sea-water to quench thirst.

The CHAIRMAN had sometimes strengthened the silver solution by freezing it and removing the ice. This method gave a highly concentrated solution.

A letter was read from a German photographer, inquiring if the Secretary of the Association could give him any information as to whether English photographers worked on Sundays.

Mr. A. L. HENDERSON said he had worked on Sundays, and had paid the penalty for it. He had many times been before the Lord Mayor, and fined 5s. for the offence. It was a cheap advertisement for him, and he did not think he had been ruined either mentally, spiritually, or physically by taking photographs on Sunday.

Mr. W. E. DENNENHAM exhibited a small lamp with a little cotton-wool placed at the small end, which he used as a filter for collodio-bromide emulsion. He had used it with great success, and the whole thing had only cost a penny. In reply to Mr. Henderson, he thought washleather would stop too much bromide.

The CHAIRMAN had forced collodio-bromide emulsion through washleather by means of a piston.

Mr. A. MACKIE used a bottle with the bottom cut off, a little wool being tied over the aperture as a filter.

Mr. W. E. DENNENHAM showed a collodio-bromide transparency, made with the new methylated spirit, which he found did not hurt the emulsion at all.

Mr. A. MACKIE had had four samples of the new spirit, and found every one of them different. In ascertaining how much water was required to produce permanent milkiness, he found that in three cases it was twenty per cent., and in the other thirty per cent.

The CHAIRMAN said that they would soon be using the old methylated spirit again.

Mr. MACKIE had investigated samples of the old kind of spirit. The substance used was not in every case wood naphtha, and sometimes had a smell absolutely distinct from wood naphtha.

The remainder of the evening was devoted to an exhibition of lantern slides by Messrs. Maitland, Everett, Bouts, Rawlings, Austin, Cooke, Simmonds, Chang, and Beckett.

North London Photographic Society.—March 15, Mr. Hedley M. Smith in the chair.—The business of the evening was a lantern-slide competition, the slides being made from four negatives supplied to the members for the purpose. The comparison was made by means of two lanterns, identical in their optical construction, and carefully adjusted to give equally lighted discs on the screen. Two similar slides being thus shown side by side, the inferior one was removed, the best remaining until displaced by a better. The four sets having been thus disposed of, and voted upon, it was found that Mr. J. Oakley had taken three first places and one second with Mawson's lantern plates (pyro development); Mr. B. J. Grover, one first place and one second with collodio-bromide plates, the emulsion being his own preparation; Mr. E. M. Groundwater, two second places with Ilford Special plates (hydroquinone developer). Arrangements have been made to obtain the loan from the Photographic Society of Great Britain of Dr. Jeserich's paper on *Photography as applied to the Detection of Crime*, which will be given, with the original illustrations, at the next meeting, on Tuesday April 5, at a quarter-past eight p.m. Visitors are invited.

Hackney Photographic Society.—March 17, Mr. Beckett in the chair.—The members were reminded of the loan collection of lantern slides. The idea was to form a collection, which could be lent out to members on application. A result was shown, in which comparison had been made between alpha and ordinary lantern slides, and it was generally thought that the alpha was the better. A paper on *Lenses* was given by Mr. W. P. Dando, tracing the subject from how light was obtained, and the effect brought about by the lens. Numerous diagrams were used by Mr. Dando to illustrate his paper. Astigmatism, spherical aberration, and every point, fault, and otherwise was exhaustively dealt with by the lecturer, and in a very comprehensive manner, so that the merest tyro could understand it.

People's Palace Photographic Club.—March 18, Mr. R. Beckett in the chair.—This being the last members' lantern night, a number of slides were put through the lantern. Some slides by Mr. G. Kendall, of bronzes, vases, and tables set for dinner, proved good subjects for lantern slides. Mr. S Beckett showed a number of slides, some of which, being coloured, elicited criticism. An all-day outing to Maidenhead and Cookham for Easter, to which ladies were invited, was announced.

Polytechnic Photographic Society.—March 18.—The Secretary read a paper on *Collodion and its Apptication to Commercial Photography at the Present Time.* Although wet plates had been used in the early days for portrait work, they are seldom employed now for that purpose; some very successful negatives by Mr. W. E. Debenham were shown as illustrations of the old-time process. The principal uses for wet plates now are for photo-zincography, photo-lithography, photography on boxwood for engravers, and for lantern plates. Examples of these processes in their various states were shown, the copies, negatives, photo-prints, transfers, and finished blocks, rendering the lecture thoroughly clear. Next meeting, March 29, when Captain C. E. Gladstone will lecture on *Westminster Abbey.* Any interested photographer may obtain a ticket for admission by sending stamped addressed envelope to 309, Regent-street, W.

Kensington and Bayswater Photographic Society.—March 21.—A meeting for the formation of the Society was held at the Horbury Rooms, Kensington Park-road, Mr. C. W. Brumwell in the chair, and about forty others being present. It was resolved that the Society should have three officers only, namely, a President, a Secretary, and a Treasurer. The election of a President is left over until the next meeting. Mr. C. W. Brumwell was elected Secretary, and Mr. F. A. Hahn, Treasurer. The meetings are to be held at half-past eight p.m., on the second and fourth Fridays in each month until the end of May. The subscription is to be 5*s.* to the end of the session (September), and not to exceed 10*s.* annually. The Chairman for each meeting is to have been elected at the previous meeting. The next meeting will be held on Monday, March 28, which will be devoted to the exhibition of lantern slides. Ladies and gentlemen wishing to join the Society are requested to send their names to the Secretary, whose address is 7, Lower-terrace, Notting Hill, W.

Richmond Camera Club.—March 18, Mr. Cembrano in the chair.—Mr. Faulkner gave an address on *Makeshifts*, postponed from a former occasion. A more appropriate title would have been "Home-made Apparatus," for the various contrivances shown and explained by Mr. Faulkner, besides being beautifully made and models of compactness, were admirably designed to meet the various purposes for which they were intended. They comprised a rocking developing dish, with adjustable cover to wholly or partially exclude the light; a printing frame, with double rebate for holding coloured glass, vignetter, &c., and a simple catch for the back springs, avoiding the risk of shifting the paper in pressing the spring home; a box for exposing bromide paper, lantern slides, &c.; a combined shutter and sunshade, a drying box for negatives, a lamp for making contact exposures, and, finally, a most compact and business-like quarter-plate hand camera, which could give points to many a much-advertised "smallest thing in the market."

Croydon Camera Club.—March 14, the President in the chair.—Messrs. W. H. Heape, J. Smith, and T. B. Roberts were elected members. Mr. D. E. Goddard read a paper on *Silver Printing*, which was well received by a considerable gathering.

March 17.—The annual dinner of members and friends was held at the Greyhound Hotel, Mr. H. Maclean, F.G.S. (the President), being in the chair, supported by Mr. E. J. Wall (Editor of *Amateur Photographer*) and Mr. B. Gay-Wilkinson (the Vice-President). An enthusiastic and numerous gathering of members spent a decidedly enjoyable evening, the interest being divided between the attractions of music and of speeches, devoted to matters more or less photographic in their subject-matters. March 28 is a Lantern Night; members' slides. On April 4, Lieutenant-Colonel Gale gives a lecture, entitled *Rambles, Rural and Pastoral*, illustrated by a selection of his own slides.

Midland Camera Club.—March 18, the President (Dr. Hall Edwards) in the chair.—Mr. John Howson, of the Britannia Works Company, demonstrated the value of isochromatic plates. Mr. Howson was extremely practical, and by developing two plates exposed behind a coloured screen, the light used being magnesium wire, proved conclusively the advantages of an isochromatic plate, even without a yellow screen. His points were clearly put and understood. Mr. Bentley showed the difference he had obtained by the use of an isochromatic plate; Mrs. Welford showed a sixty-times Fry's film of a difficult church interior, to which she gave twenty minutes' exposure, and the result showed little or no halation, and also some hand-camera shots on isochromatic films. Mr. W. D. Welford (Hon. Secretary) showed the Daisy printing frame, the Ownligood developing tray, and manipulated the Todd-Forret flash-lamp.

The Exhibition of old silver prints produced prior to 1862, to which reference is made in our report of the parent Society's last meeting, will remain open for a few days, so that those who would like to have an opportunity of inspecting them may do so.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

RATIO OF GRADATION.

To the Editor.

Sir,—Messrs. Hurter & Driffield say, on page 8 of their pamphlet, "By no means at his" (the photographer's) "disposal can he alter the ratio existing between the amounts of silver reduced in the various parts of the negative; they are regulated entirely by the exposure." In their reply to Mr. Michael they state they do not hold that the "ratio is invariably the same whatever the developer employed." Mr. Phillips accuses me of discourtesy in saying these gentlemen forgot what they wrote. His conceptions on the ethics of debate must be peculiar, for if these gentlemen did not forget, how will he explain the above contradictory statements? He is guilty of rudeness to me or of unworthy insinuations against Messrs. Hurter & Driffield, of the value of whose paper I expressed my high appreciation. He absurdly gives me a challenge to prove that the ratio can be altered at will and in the same paragraph implies that Messrs. Hurter & Driffield's experiments show that it can be so altered. Why, then, should I give further testimony? The question altogether is a mere side issue, but he need not throw surreptitious mud at these able investigators.—I am, yours, &c.,

Free Lance.

COPYING INCLINED PICTURES.

To the Editor.

Sir,—*Apropos* of a recent discussion at the London and Provincial Photographic Association, I beg to point out to your readers that my equations on page 859 of The British Journal Photographic Almanac, 1892, supply the necessary details for solving such questions.

Suppose I photograph a diagram 8 inches square, with a lens of 10 inches principal focus, and reduce the same to 3 inches square, when both object and camera-back are square to axis of instrument the equations give the conjugate foci as 36·67 inches and 13·75 inches respectively. Now, setting the diagram 20° out of square will increase and diminish the greater focal distance by 1·4 inch at each side; assuming the camera-back to remain square with axis, I find that the image will be 2·89 inches and 3·11 inches high at the two sides. Now, to correct this distortion, I copy with the same lens, and the equations show that I have to set the original photograph, as well as the camera-back, at an angle of 75½° with the axis, which will represent an angle of 29° with one another. Should, however, the camera-back have been swung in making the first copy, for the sake of getting better definition, the image will be 2·84 inches and 3·16 inches high at the sides, and then the original photograph and camera-back will require to be set at 69½° with the axis and at 41° with each other. I have often solved similar questions by my equations, and found the result correct in practice.—I am, youre, &c.,

J. A. C. Branfill.

DEPTH OF FOCUS.

To the Editor.

Sir,—In his letter published in The British Journal of Photography last week, Mr. Clifford E. F. Nash takes exception to my statement in regard to depth of focus depending on the actual size of the stop, uninfluenced by the focus of the lens (p. 167 in your issue of March 11).

It is certainly correct that the circles of confusion with different lenses will be the same for the same diameter of stop only when the images are equal in size. In photographing from a given standpoint with lenses of different focus, the circle of confusion will be proportionate to the size of the image or focus of lens, the actual measurement of the stop being the same in either case; so that if a twenty-inch focus lens were used under such circumstances that with an aperture of one inch or *f*-20, the diffusion were one-fortieth of an inch, the substitution of a five-inch lens and *f*-5, or one-inch aperture, would give $\frac{1}{40}$ approximately.

This, however, does not cover the question involved. It does not necessarily follow that the smaller lens would give four times the depth of focus of the larger; dissimilar images cannot be compared by the circle of confusion alone; it cannot be assumed that this should be the same in a quarter-plate as in a 15 × 12 of the same view. A diffusion of outline that would only give softness in the larger picture would be sufficient to entirely destroy the character of the finer details in the smaller, as every detail in one is four times larger than in the other. If the mast of a yacht, for example, measured one-sixteenth of an inch, one-fortieth of an inch diffusion would be very different from the same amount in an image that was one sixty-fourth only. This would not be the same depth of focus; in order to produce the same effect the departure from actual sharpness should be proportionate to the size of the images.

This is strongly supported by assuming two negatives to be taken of a certain view, one with a twenty-inch focus lens, and the other with a five-inch, the latter being then enlarged four diameters. If the same circle of confusion were allowed in each negative the enlargement would

show four times as much "fuzziness" as the direct print in any part that was out of focus, and it could not possibly be contended that the two lenses had given equal depth. If, however, the diffusion in the larger negative were four times that in the smaller, the enlargement and the large direct print would be absolutely identical in sharpness, and this should be called the same depth of focus. *To produce this result the aperture would measure exactly the same with each lens*, which would support my original statement.

In my paper it was considered best to give the most simple illustration of this principle, in fact, the only one that could readily be seen by comparing the circles of confusion alone.

In the portion published in your issue of February 19, there is a slight printer's error in the last paragraph: *one-fourteenth of the focus* should read *one-fortieth*.—Yours, &c., HENRY W. BENNETT.

To the EDITOR.

SIR,—I have read an article in your JOURNAL of March 11, 1892, signed Henry W. Bennett, on photographic lenses, in which it is assumed that depth of focus depends on the actual size of the stop, and is not influenced by the focus of the lens.

Mr. Bennett says that this proposition is somewhat startling to most photographers, and I confess that it has also startled me, because I think it is contrary to mathematical principles, and also to what Mr. Dallmeyer says on the depth of focus in his short treatise on photographic lenses.

If two lenses have the same diameter, or if you make use of the same stop, and the focal length of one lens is the double of the focal length of the other, an object, viewed, of course, at the same distance, will not be equally defined, if the object is nearer than the plane, beyond which all objects will be sharp, because this plane will not be situated for both lenses at the same distance. It will be about half the distance for the object lens with the shorter focus. If two lenses have an aperture of the same value, the depth of focus does not vary in inverse proportion to the focus of the lens but as the square, consequently a sixteen-inch lens will possess, not half, as Mr. Bennett says, but only quarter of the depth of an eight-inch lens, if *f*-16 were the stop used in each.

I hope you will agree with what I take the liberty of writing to you.—I am, yours, &c., BARON ALBERT DE ROTHSCHILD.

Vienna, Austria, March 17, 1892.

MISLEADING PHOTOGRAPHS.

To the EDITOR.

SIR,—I notice in the "Answers to Correspondents" column in your last issue an inquiry by "Solicitor," as to some misleading photographs which are about to be produced by an opponent in a lawsuit respecting the value of an estate. Allow me to suggest that he should have some stereoscopic views taken, as these, when viewed in a stereoscope with lenses of the same focal length as those used in the camera, must represent the view exactly as seen in nature.

I have often wondered why stereoscopic photography is not universally adopted in legal and criminal cases.—I am, yours, &c.,

Bryn Coed, Crescent-road, Chingford, March 19, 1892. T. HORNE REDWOOD.

THE ENFIELD CAMERA CLUB DISSOLVED.

To the EDITOR.

SIR,—Referring to my previous circular, I have to inform you that at the meeting held on the 10th inst. it was resolved:—1. To dissolve the Enfield Camera Club. 2. To leave the Committee to realise the property of the Club and apportion the result to members at their earliest convenience. The above resolutions speak for themselves, and I send you same with much regret. You will hear from me when the latter resolution has been carried into effect. Meantime, I am, yours, &c.,

JAS. DUDIN, *Hon. Secretary.*

Enfield Camera Club, Roseneath, Chase Green-avenue, Enfield, March 19, 1892.

P.S.—Those members who joined quite recently and paid their subscriptions and entrance fee will, of course, have same returned.

CORRECT EXPOSURE AND THE SPEED OF PLATES.

To the EDITOR.

SIR,—In my *Index of Exposure* I have hitherto given a speed table of plates compiled on information supplied by the plate-maker in each case and based on sensitometer numbers. The public have by this time gradually, but surely, confirmed the opinion expressed in the first edition, that sensitometer numbers are hopelessly and entirely unreliable.

This being so, I propose, in the forthcoming edition, to omit the plate tables in the form in which they have hitherto appeared, and substitute what I will call an experience table, compiled from the actual experience of users of the plates, in place of the manufacturers' quotations based on sensitometer number, or, as in many cases, on mere guesswork, in which the "wish" to have a high-speed representation has been "father to the thought," when quoting for publication in a list intended to show correct speeds, but to a large extent inaccurate, because regarded as comparative and competitive.

To enable me to prepare this experience table, I ask your kind assistance in placing my request for information before your readers, and I shall be greatly indebted to all such if they will oblige by sending me, through the post, to Sutton, Surrey, *an early reply* to the following questions:—

1. What plates do you use?

2. What "No. of Times" have you found them to be, on the basis of Wormald's tables for thirty-times plates?

By kindly complying with this request they will render public service, in helping to a better knowledge of correct exposure, without which the pursuit of photography has so frequently been found uncertain and disappointing.—I am, yours, &c., A. R. WORMALD.

Sutton, Surrey, March 21, 1892.

P.S.—The new table will only give collated results; in no case will the name of any correspondent be printed.

'THE LEGAL SIDE OF PHOTOGRAPHY.'

To the EDITOR.

SIR,—As adding to the practical value of the lecture under the above title, reported in the valuable columns of your last issue, permit me to say that the lecturer, Mr. Watson Brown, B.A., LL.B., is himself a practising solicitor. May I add that the directorate of the Leytonstone Camera Club have been highly complimented upon their lectures and their lecturers, the latter being all members? We are a young club, not yet nine months' old, but are happy in the possession of several professional experts. I make these remarks with the only object of inviting visitors to the weekly Wednesday evenings at the Leytonstone Assembly Rooms. I shall be happy to send a syllabus to any gentleman who cares to put himself into communication with me.—I am, yours, &c.,

ROBERT OVERTON, (*Joint*) *Hon. Secretary.*

'*Our Camera Club*,' *Leytonstone, March* 21, 1892.

BORROWED PLUMES.

To the EDITOR.

SIR,—Could you give me the address of a firm that would supply me with specimens? I am in rather an awkward position, as the firm I have recently left did their own printing, and I do not at present know a firm that would supply me with specimens. Of course, I should want them unmounted and decent, and am willing to give a fair price. I would guarantee, if necessary, that they should all be destroyed within a month of my opening the business, as I do not wish to injure the trade by good specimens and inferior work. I have enclosed a stamped, directed envelope.—I am, yours, &c., SPECIMEN.

[We have substituted a *nom de plume* for our correspondent's real name. Æsop tells us of an unlovely fowl that strutted about in the borrowed plumage of a more beautiful bird, and thereby encountered a melancholy fate. We had hoped that this disreputable traffic in specimens among photographers just commencing had entirely ceased. —ED.]

Exchange Column.

**** No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Wanted, 7×5 carryscope, in exchange for a Dallmeyer 1 a C.-D.-V. lens.—Address, [illegible], Photographer, Coventry.

Will exchange Rouston Humber tandem tricycle, in good condition, for good half-plate camera, lens, and stand complete.—Address, F. H., 29, Russell-road, London, W.

Will exchange a whole-plate, long-extension camera, rapid rectilinear lens, and three-fold tripod, for Safety bicycle of good maker.—Address, GOAD, 38 Rainbow-street, Camberwell, S.E.

Wanted, cabinet portrait lens, by good maker, in exchange for telescope on table stand, with terrestrial and celestial eyepieces, &c., fitted in cabinet.—Address, R. S., 12, Park-road, Blackburn.

A quarter-plate camera, double extension, and all improvements, with six double dark slides, with leather case, in exchange for a wide-angle rapid rectilinear lens by good maker.—Address, EDWARD HUGHES, 2, Trafalgar-terrace, Bray, Ireland.

Splendid whole-plate camera, tripod, and five double dark slides; will exchange for Safety bicycle, American organ, or half-plate camera, with cash adjustment. Also a powerful, whole-plate burnisher, with gear; will exchange for a half-plate rolling press.—Address, GARSON, Chelmsford.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

John Rowley, Eccles.—*Portrait of Nellie Wood, age* 100.

T. Protheroe, Bristol.—*Photograph from an Oil Painting of Right Hon. W. E. Gladstone.*

W. H. C.—Inquire of Hampton, Judd, & Co., Farringdon-road, E.C.

GEORGE SCHULTZ.—Dr. Maddox's address is Greenbank, Park-road, Portswood, Southampton.

H. J. CHANNON.—The length of your letter has compelled us to hold it over until next week. Thanks.

T. P. COLLINGS & Co.—At p. 147 of the ALMANAC for 1875 will be found instructions for printing on wood by the "blue" process.

D. J. O'NEILL.—The address of the author is East India-road, E. We have no further information than that contained in the paper.

W. HILL.—Particulars of working the wet-collodion process may be obtained from any old treatise on photography, such as Hardwich's *Manual*.

BOND.—We are unable to give you the names of manufacturers—not wholesale dealers, who do not make—of trays, mats, preservers, and ferrotype plates for the wet-plate process, either English or German.

R. C. C.—Water that has been boiled for half an hour or so, preferably in an old kettle, and allowed to cool, will do quite well for dissolving oxalate of potash. A slight precipitate, if any, of oxalate of lime may be disregarded.

R. FULLER.—All the different companies that have been formed to take "photographs in natural colours" have, as a matter of course, "come to grief," and so, to an extent, have those who, unfortunately for them, invested money in the concerns.

RALPH complains that he cannot get crayons to take on bromide paper, because there is so much glaze. He asks how the surface is prepared?—If the print be rubbed over with finely sifted pumice or cuttlefish powder, it will give a tooth that will take the crayon freely.

JOS. SPA.—So far as we can judge from the print sent you have been far too lavish in the use of the lubricant; also, we fancy that the roller of the burnisher must be a little hollow, as the pressure on the middle of the picture does not seem equal to that at the sides.

J. BURLEY asks: "Can you give me any rule, &c., to guide me as to the correct distance the two lenses should be apart in a rectilinear or euryscope? Have opticians any particular method, or is it arrived at by 'trial and error!'"—There is no method but that of trial and error.

Y. G.—If the silver stains caused by printing from the negatives before they were dry cannot be removed by a weak solution of cyanide of potassium, we fear they are ruined. The formula for Farmer's reducer is: Ferricyanide of potassium, six grains; hyposulphite of soda, one drachm; to water, eight ounces.

BIRT ACRES.—The view you take of our remarks may be excusable, but we cannot quite admit that it is the correct one. We had no desire that you should interpret our concluding sentences in so markedly a personal sense. As we can see no possible good in prolonging the controversy, we do not publish your letter.

S. J. E. complains that he cannot get the chloride of silver, precipitated with common salt, to settle down from the washing waters from prints prior to toning, and seeks assistance. If a small quantity of nitric acid be poured in, and the whole vigorously stirred for a few minutes, the chloride will subside in a few hours.

D. J. S.—The plate, so far as we can judge, is insoluble. Why, we cannot say. It will be quite impossible for you to get anything like a satisfactory collotype plate with the primitive drying arrangements you are using. Collotype is a process that wants considerable study and practice before it can be worked satisfactorily, and that can only be done with suitable appliances.

A. STOKES wishes to know if all the detective cameras sold by the different dealers are patented, and, if so, whether he would be allowed to make one for his own use, but not for sale.—Some of the cameras are patented, and some are not. Our correspondent can make any of the latter for his own use or for sale; but, with regard to the former, he must obtain a licence from the patentee, even for one for his own use.

DISAPPOINTED.—The queries are so ambiguous that we scarcely know how to reply. A patentee has a protection in his patent, and no one else has a right to manufacture or use the invention. If any one infringes the patent, the owner can recover damages and obtain an injunction restraining further infringement; but the patentee will have to substantiate his patent by showing that the invention is new, and that he is the inventor, and, therefore, entitled to obtain a patent for it.

G. J. J. asks: "1. If any special restrictions are put upon tourists visiting Rome or Naples as regards taking photographs of public buildings, &c.? 2. Can you recommend films instead of plates for such work?"—1. Perhaps some of our readers who have photographed at Rome or Naples can answer the question. 2. Yes, other things being equal.

METROPOLITAN says: "I am a stationer, and, two years ago, took up selling photographic apparatus and chemicals. Amongst the latter are bichloride of mercury, cyanide of potassium, and the usual things used by photographers. A neighbour of mine, a chemist, seems annoyed at this, and has told some persons that I am infringing the law, and that he could, if he chose, stop me, as well as have me mulct in heavy penalties." He wishes to know if this is not "idle bounce?"—Certainly not. Under the Poisons Act any one but a certified chemist is prohibited from retailing poisons which are named in the schedule, amongst which are those mentioned, and then only under certain conditions, such as in the presence of a witness, entering the name of the purchaser in a book kept for the purpose, and attested by him. Any one infringing this law, which is very stringent, renders himself liable to very heavy penalties.

NEMO writes: "Some time back I developed a negative of a church, with the result that the spire and weathercock obtained too much density to print through. I locally reduced this, and so the spire, &c., prints through all right; but in the reducing operation the sky parts surrounding got reduced also, so as to print through in patches. I got over this by blocking out with Bates's black varnish. Now, if I varnish the negatives in the ordinary way, the varnish will dissolve Bates's black, and thereby render useless all my careful work in blocking out the spire. Is there any varnish that can be procured that will not dissolve Bates's, or you, perhaps, might know of some method whereby it might be overcome?"—We do not know the composition of Bates's varnish; therefore, cannot say what varnish will not disturb it. However, we should surmise that ordinary negative varnish, if the plate is not made too hot, would not do so. If a trial proves that it does so, then it can be protected by coating the film with a thin solution of gelatine before applying the varnish. On the whole, it may be less trouble to clean off the present "blocking out," then varnish the negative, and block out again with the black.

PHOTOGRAPHIC CLUB.—March 30, Smoking Concert. April 6, Dark-room Appliances; paper by Dr. Jeserich on *Photography as Applied to the Detection of Crime.*

ON Wednesday evening next, Mr. Gambier Bolton lectures at the Birkbeck on *Wild Animals in Captivity*, illustrated by photographs. The Secretary of the Institution will supply tickets.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—March 31, *Photography on Wood*, demonstration by Mr. W. J. Rawlings. April 7, *Collodio-bromide Emulsions*, by Mr. Alexander Mackie. April 14, Adjourned Discussion on *The Wet-collodion Process.* Visitors are welcomed.

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB (PHOTOGRAPHIC SECTION).—Fixtures for April: 1, *Cresco-Fylma*, by Mr. A. J. E. Hill. 8, *An Improved Platinum Paper*, and *Printing by Artificial Light*, by Mr. J. W. Smith. 9, Half-day Excursion. 22, *Films.* 23, Half-day Excursion. 29, *Amateur Plate-making*, by Mr. A. S. Wild.

A ROYAL RECOGNITION.—Some time since we recorded the fact of Her Imperial Highness the Archduchess Stephanie of Austria having expressed a desire to possess one of Mr. Dresser's pictures which was on view at Vienna last year. The picture was of course duly forwarded to Her Imperial Highness, who, in return, has lately made Mr. Dresser a present of a beautiful gold pin set in rubies and diamonds, having her own monogram and the Austrian crown on the top.

AMONG the lecturers at the Royal Institution after Easter will be Mr. Frederick E. Ives, with two lectures on *Photography in the Colours of Nature* The Friday evening meetings will be resumed on April 29, when a discourse will be given by Dr. William Huggins, on *The New Star in Auriga*; and succeeding discourses will probably be given by Captain Abney, Dr. B. W. Richardson, Mr. J. Wilson Swan, Sir James Crichton-Browne, Mr. Ludwig Mond, Professor Dewar, and other gentlemen.

MR. HUME, of Edinburgh, is shipping to China a "Cantilever" enlarging apparatus, with thirteen-inch aperture condenser, to cover fully an 8×10 plate. It is an instrument of the highest finish, in the "Indian pattern," brass-bound, on gun-metal feet, sliding on rails six feet long. The brass draw-tubes are very massive and rigid, being one and a half inches in diameter and four feet long. The movements of the relative parts provide for the making of pictures from one to ten diameters of the 10×8 plate. It will thus make enlargements up to eight feet.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1665. Vol. XXXIX.—APRIL 1, 1892.

THE USE OF FOCUSSING EYEPIECES.

Our title comprehends a broad field of subjects, but we more particularly desire to restrict it to optical combinations for ordinary every-day work in studio, or field portraiture, or landscape. Something might be said of the microscope as used for the purpose in photo-micrography, or the small lens employed by the optician in lieu of any "ground glass" in testing the capabilities of his various lenses; but we would leave such branches of the topic for dilating upon at some future period, as, instructive though a discussion upon them would be, it could not be comprised within the limits of a single article. We were led to the belief that some remarks about eyepieces would not be misplaced by a little incident that occurred within our own ken.

Some years ago, when photographing in company with a gentleman who had had much experience, we found him toiling, we might almost say, in the endeavour to get a sharp focus of a difficult subject. We offered him the loan of a focusser we had at hand, and he, smilingly, said he had no need for any such aid, but still, out of politeness, made use of the proffered assistance. Lately, however, in conversation with him, we found not only that he now invariably focussed with such optical aid, but he was very *exigeant* as to the particular form of instrument employed.

And so we believe—nay, we know—the case stands with many. Some decline the use of a focusser under the idea that it is unprofessional and amateurish, others are afraid they will be bantered as having poor eyesight; and it is our experience that when a man really does begin to feel the need for a pair of spectacles, but can just manage without, that is the time he is most insistent upon the fact that his eyes are as good as ever.

Finally, there is still another class who have no knowledge of a focussing magnifier except through the optician's price-lists. Of course, for outdoor work it increases, though by a very small amount, the weight of the kit, but we do not hesitate to say that where accurate focussing, especially with large angular apertures, is desired, the use of such an instrument is invaluable, whether it be a home-made one, constructed of a pill-box and a spectacle lens or a thoroughly convenient and specially devised one, as sold by the lens-manufacturers for the particular purpose. Naturally, much depends upon the eyesight of the photographer as to the extent of its usefulness, but, to the best eyes, there are times when some things could not be satisfactorily and quickly done without employing it. For example, we have met a gentleman whose eyesight was so acute that he could read, aloud and quickly, matter printed in Snellen's smallest test-types at a distance just under five feet, which is equivalent to saying he could see objects with a facility equal to that enjoyed by an average reader armed with a glass magnifying four diameters. This, however, is a very exceptional case, and the greatest value of the focusser is felt by those whose eyesight is as good as ever for objects more than about half a yard away, but inefficient within that distance. If they wear glasses, this particular evil is by them corrected; but there is a large body who, in ordinary cases, would receive benefit from its common use, and a still larger body by its occasional use.

It is not necessary to have an elaborate or a costly instrument. The most simple is a spectacle lens of deep curves, fitted at the end of a pill-box. Some who carry a small magnifier in their pocket find it convenient to use it; but the employment of this kind of lens is greatly facilitated by having a portable foot or case for holding it at a constant distance from the ground glass; in fact, the real value of the focusser is not felt unless some such provision be made. A common three-legged seed microscope is often used; but it is always better for the foot or tube used to keep the lens at a constant distance to be opaque, and thus prevent the part to be magnified from receiving any extraneous light. This, indeed, is one of the recommendations of the instrument. Of the better class of magnifiers, the most common is a Ramsden eyepiece, fitted with a screw for adjusting the distance from the focussing screen for any eyesight. There is also fitted with this pattern a screw-collar, or other contrivance, for clamping the lens *in situ* when once the focus has been duly set. Some of the objections to the employment of the instrument have arisen through one person attempting to make use of a glass set for one eyesight and not adapted, perhaps, to that of the objector. The great advantage of this particular form is the large field of view it permits and the perfect flatness of the whole of the field.

We have seen one, and one only, of this make modified in what we consider a very advantageous manner. The photographer who used it in his studio had found that the constant use of the metal upon his focussing screen had dimmed its surface by a multitude of fine scratches. He fitted a new screen, and had adapted to his Ramsden a flange, covered with velvet, and this was an improvement in many ways. As to the actual mode of employment, that is almost self-evident; but it may be pointed out that, to get its full value, the screen should be of very fine glass—etched, not ground—rendered still further transparent, in the usual manner, by oiling the surface. Then, again, it may be said that when examining very dimly illuminated objects the magnifier is best placed, not flat against the glass, but at an angle, pointed, in fact, in the direction of

the centre of the lens. We need add no more after saying that, by the use of a focussing magnifier, time is saved, and convenience consulted to an extent that is not dreamt of by those who ignore, and, as is often the case, almost deride its employment.

ADVANCES IN KALLITYPE PRINTING.

Almost contemporaneous with the publication of the fact that Mr. W. Willis has succeeded in devising a platinum printing process, having the image-forming compound on the surface of the support, and developable at ordinary temperatures, to which it is said that certain refinements in the quality of the pictures will be joined, we are in possession of details of some improvements recently effected in the kallitype process, which, from the point of view of simplicity of working, we are disposed to consider as advances. In order to appreciate the nature of the improvements, it may be necessary briefly to recite the stages through which kallitype printing has passed.

The first process, called Kallitype, No. I, consisted in the main of coating paper with a ferric compound, exposing to light in the usual way, and developing the ferrous image by means of a solution containing silver nitrate and a soluble salt of an alkali metal or ammonium—such, for example, as potassium oxalate—and ammonia. The prints were then washed in a solution of soluble citrate or ammonia. This process, however, has, we believe, been abandoned in favour of that called Kallitype, No. 2. In this a mixture of ferric oxalate and silver nitrate is applied to the paper, and the picture is developed in a bath containing Rochelle salt and borax, the washing solution consisting of ammonia and water. It will thus be perceived that in the second process the silver is applied direct to the paper before exposure, instead of, as in the older method, being made a constituent of the developing bath.

Two modifications of the process are now published, each having distinctive features of its own, which assures us that the possibilities of this system of printing are not much more than in their initial stages of realisation. In the first of these the sensitising solution consists of ferric citrate, oxalic acid, and silver nitrate, and the prints after exposure are developed by means of ammonia and citrate of soda; that is to say, without the employment of a "developer" *per se*, a final washing in dilute ammonia being, of course, necessary. In the second modification, however, not only is a developing solution *per se* rendered unnecessary, but development itself is obviated. This is achieved by coating the paper with a mixture of ferric oxalate, potassium oxalate, and silver nitrate. Paper so sensitised prints out in the frame—a result due presumably to the presence of the potassium oxalate, and the pictures are washed in citrate of soda and citric acid, and finally in ammonia, as heretofore.

Assuming the last-mentioned process to be perfected for commercial purposes, kallitype will offer the advantages of supplying both a developing and a printing-out process. Of the comparative merits or demerits of the two methods we do not seek occasion to speak at present, but it may be permissible to submit that probably the larger number of modern amateurs prefer those systems of printing which produce the image without the need of development—a fact to be considered in noting the vitality of the much-condemned and attacked albumen process.

Kallitype is the only silver printing process extant which does not entail the use of hypo as a fixing agent—which, taken in conjunction with the variety of ways in which the image may be produced, disposes us to believe that it has secured a permanent place among modern printing processes. Of its artistic capabilities we have spoken before in a favourable strain, while as for the probable "permanence" of the results we think there is little to be feared on that score.

Death of Mr. A. Vandyke, of Liverpool. — We are sorry to learn of the death of this eminent Liverpool photographer, an event which took place yesterday (Thursday) morning, at half-past one, after an illness of only three days. Mr. Vandyke, who was some years since a partner of the firm Vandyke & Brown, made a speciality of large direct portrait work, and for this class of portraiture received a medal at the last great International Photographic Exhibition in Liverpool.

The Price of Silver.—On Tuesday last bar silver was quoted on the Exchange at 39*d.* per ounce, this, of course, producing a corresponding fall in the price of the nitrate, which will, doubtless, be welcome to the dry-plate makers, enabling many of them to augment the scanty profits of which complaint is often heard. As it is thought that the price of the metal has reached its lowest point, we may suppose that large stocks of nitrate will be bought by the various industries employing it, among which, by the way, photography does not by any means occupy the leading position.

"Snap-shotting" in the Antipodes.—The enthusiastic amateur with the hand camera is, apparently, not confined to this side of the globe. In the account of the removal of the man Deeming, who is suspected of several murders, from the court at Perth (Western Australia), an amateur, with a hand camera, attempted to obtain an instantaneous photograph of him. The prisoner, observing what was being attempted, resented, as he had done being sketched in court, and, as the *Standard* has it, "it was with some difficulty that he was restrained by the police from 'going for' the enterprising amateur." In this country, it is a little surprising that enthusiastic "snap-shottists" have not been "gone for" more frequently than they have been, seeing the objectionable manner in which some amateurs use their detective cameras. *Verb. sap.*

The New Methylated Spirit.—Despite the many protests which have been uttered as to the action of the Excise in ordering the addition of mineral naphtha to methylated spirit, and its assumed unsuitability for emulsion work and other photographic processes, we have so far had little, if any, published experiences of those who have tried it in lieu of the old kind. It is, therefore, interesting to know that at least one experimentalist has been working with it, and still more surprising to find that the results of his attempts to use it were far from that unsatisfactory nature which might have been anticipated. At a meeting of the London and Provincial Photographic Association the other night Mr. W. E. Debenham showed a collodio-bromide transparency made by the aid of the new spirit, which, he stated, he found did not hurt the emulsion at all. It would be just as interesting to know whether the spirit would be equally innocuous in the case of gelatine emulsion.

Sel d'Or.—In connexion with the above subject, modern photographers often confound the old *sel d'or* toning bath with that of the hyposulphite of soda and gold compound toning and fixing bath. This was the case at the meeting the other night. The latter bath was made by adding the chloride of gold, in solution, to a strong solution of hyposulphite of soda. The prints, when immersed in this, toned and fixed at the same time—often a matter of several hours. *Sel d'or* is a double salt of hyposulphite of gold and soda, and forms needle-like crystals. It used to be sold in small bottles containing fifteen grains each, as the chloride of gold now is; but the price was much higher, about four shillings for that quantity. An acidified solution of this salt formed the toning bath, and the prints were

afterwards fixed in a plain solution of hyposulphite of soda. The principal use of this salt was, however, for gilding Daguerreotypes. though it was also used for toning plain salted paper prints. With albumen prints it did not answer, as it had a tendency to make the lights yellow. From this it will be seen that the two methods of toning were widely different.

Orthochromatic Effects.—Divers opinions are often expressed as to whether plates, prepared with eosine, render any orthochromatic effect without a yellow screen. Some have averred that they do, while the thing is as strongly denied by others. Possibly the lenses used in the experiments may, in a measure, account for the discrepancies. We are led to this remark from being recently shown a lens with two cemented surfaces, which, when placed on white paper, was decidedly yellow, though the glasses themselves, we were assured, were quite colourless. The Canada balsam, used in cementing, was the cause of the yellowness. If a lens of this kind were used in one set of experiments, and one free from colour in another, it is quite conceivable that the results would not be in accord, inasmuch as practically a yellow screen had been employed in one case and not in the other. With some old lenses, not only has the balsam become yellow, but the glass also; indeed, the latter was so tinted in the first instance. Now, working with a lens of this description becomes equivalent to using a faint yellow screen. Opticians are now able to obtain glass free from colour, and it will be obvious that lenses made with it will show orthochromatised plates to a disadvantage as compared with lenses of yellow glass and discoloured balsam.

Old Silver Prints.—The exhibition of silver prints made thirty years and upwards ago, now open in the rooms of the Photographic Society, is, numerically, by no means a large one. But it is an exceedingly interesting as well as instructive one. All modern photographers should take the opportunity to see the collection, as they will see the class of work produced when the art might almost be said to be in a primitive state. At the period that most of the negatives were taken the only lenses in use were the single lens and the Petzval portrait combination. Retouching the negative was a thing unheard of. There were no dry plates except those that required many minutes' exposure in a good light, and all negatives were by the wet-collodion process. Furthermore, the alkaline gold toning process was not then introduced. Yet, as the Chairman remarked at the meeting last week, with regard to the pictures, nothing much better was produced at the present time, either as negatives, ortho or isochromatic effects, artistic compositions, or production of an optical tool. An idea seems to prevail at the present time that silver prints must necessarily fade in a year or two, yet there are prints shown that are thirty-seven years old which indicate very little, if any, signs of decay. There are a series of prints a couple of years younger, some of which are in a good state of preservation notwithstanding that about twenty years of their life were spent in parcels as lumber in damp attics. The mounts show that they have been covered with mildew, yet the pictures, though in some instances yellow, show no loss of detail. In face of these examples, who will say that silver prints cannot be made permanent? This exhibition will remain open till April 12.

Thermo-dynamical View of the Action of Light on Silver Chloride.—Speaking to this subject at a recent meeting of the Physical Society, Mr. H. M. Elder said that "in the decomposition of silver chloride by light chlorine was given off, and a coloured solid body of unknown composition (sometimes called 'photochloride') formed, the reaction being indicated by the formula $nAgCl = Ag_nCl_n - 1 + \frac{1}{2}Cl_2$. If the experiment be carried out in a sealed vacuum, the chloride is darkened up to a certain point, but regains whiteness when left in the dark. These facts have led him to believe that the pressure of the liberated chlorine is the function of the illumination or intensity of light falling upon the chloride, in the same way as the pressure of a saturated vapour is a function of the temperature. Since illumination is a quantity in many respects analogous to temperature, he considers it not unreasonable to apply thermo-dynamic arguments, and regard rine, in presence of silver chloride and 'photo-chloride,' 'be working substance in a 'light engine.' He therefore supposes a Carnot's cycle to be performed on the substances at constant temperature, the variable being pressure, volume, and illumination. Since the cycle is strictly analogous to Carnot's, except that illumination is written for temperature, he infers that the efficiency is a function of the two illuminations. It also follows that, just as Carnot's cycle is used to determine an absolute scale of temperature, so this cycle may be applied to determine an absolute scale of illumination. It only remains to determine an empiric scale analogous to the air thermometer, and to compare it with the photo-dynamic scale, provided a method of making the comparison can be devised."

Life Size—what is it?—In the paradoxical paper by Mr. H. P. Robinson, read at the Photographic Conference last week, one of the points raised practically was, whether we should have scientific truth, artistic truth, or lies in photography. Some commercial photographers would answer by saying, "You pays your money, and you takes your choice. We will supply what you desire, only tell us what you want." This is pretty well expressed in the communication, and brings us to a practical point that comes before portraitists every day. What is life size? The obvious answer is, the size of life, and that is correct; but will it appear to be so in the picture, that is the point? It can, with equal truth, be answered both negatively and positively, inasmuch as the picture may seem the size of life, or either larger or smaller, according to circumstances, although the actual dimensions are the same in all the cases. For example, if two portraits be enlarged, the one, say, of a gentleman with round features, and but little hair on the head, and a small beard; the other just the reverse—long features, with beard and a good amount of hair on the head, both of the exact size, by measurement, of the prototypes, the enlargements in this case should include a good amount of the figures—say, made on paper forty-five inches by thirty-five. If these two pictures be framed the full size, and hung pretty high in a room, the one will look much smaller than life size, the other but little so. If, instead of being framed the full size, they are cut down to twenty-four inches by eighteen, the small-featured one will seem nearly life size, and the other but little over. Now, if the pictures be still further cut down—for example, the heads only framed behind fifteen by twelve inch mounts—and be hung on a level with the eye, both will seem larger than life size, that with the long features and full beard appearing to be of really Brobdignagian proportions. What shall we go by? actual measurement or apparent accuracy in everyday work?

VARIATIONS IN COLLODION EMULSION WORKING.

All who have worked with collodion emulsions must have experienced, at one time or another, their vagaries arising from different samples of pyroxyline and various other causes, perhaps at the moment wholly inexplicable, and for that reason all the more annoying. In the case of washed emulsions, it frequently happens that, although in its first stage, that is, before pouring out to set, it was as nearly perfect as might be. After the operation of removing the soluble salts has been performed, it is found to have lost all power of giving density, sometimes even under silver intensification. With some samples of pyroxyline, this will be invariably the case, for the simple reason that the cotton is entirely unsuited to the process, but it will occur occasionally even with samples that are known as a rule to work satisfactorily.

Again, in the case of an unwashed emulsion, it is not unusual to obtain a somewhat similar result, more especially when the collodion is sensitised very shortly after bromising. Here, too, the fault may be laid to the pyroxyline, for while some kinds, chiefly of the so-called "high-temperature" class, but by no means invariably so, will admit of the collodion being made, bromised, and sensitised straight away in one operation, the majority, if they do not absolutely require it,

are, at any rate, better for being allowed to "ripen" for some days, or a few weeks, between bromising and sensitising. In many instances the utility of this aging or ripening is so great, that a collodion that is utterly useless when freshly made will, in the course of three weeks or a month, give the most perfect results possible, and this is especially the case when a large proportion of cadmium salt is employed in bromising.

Whatever the cause may be, the result is sufficiently annoying, for it is anything but satisfactory to have a quantity of emulsion on hand that is absolutely useless and represents so much material wasted. Emulsions of this character seldom or never—practically never—improve by keeping, as does the unsensitised collodion, but retain their bad qualities to the last; whereas one that is slightly foggy when newly made will often be found to work perfectly satisfactorily after a short time. It is therefore of no use to keep the emulsion on the chance of its improving, and means have to be sought by which it can be brought into a proper state. Fortunately, these are easily available at the cost of a little more labour and material, which is better than losing the whole batch of emulsion.

In the case of an unwashed emulsion that refuses to give density, if the cause be simply the want of ripening, it is only necessary to add to it, say, an equal quantity of the same bromised collodion, and set it aside for a few weeks, when, on the addition of the requisite quantity of silver nitrate to sensitise the newly added collodion, the result will, in most cases, be an emulsion as good as, or perhaps a little better, than if the sensitising had been performed in one operation with the same interval after bromising. The prolonged contact of the silver bromide, first formed with a large excess of soluble bromide, conduces to a finer and better character of the image, and this method of sensitising in two operations, with a wide interval between, is one that has long been recognised as a good one.

If the want of density occur with a collodion that has had time to ripen, it is still a proof of the unsuitability of the pyroxyline, but the same remedy as in the last case is obviously not available. The cause is, no doubt, the want of a sufficiently powerful organic reaction between the pyroxyline and the silver, when, as happens in the great majority of cases, the soluble bromide is in excesss during the whole of the period of sensitising. To remedy this it generally suffices to over-sensitise a portion of the collodion, allowing it to stand in the presence of excess of silver for a few hours, and then to add a sufficient quantity of the same bromised collodion, to leave the soluble bromide just slightly in excess. For instance, in preparing five ounces of emulsion, let four ounces of collodion be sensitised with silver sufficient for five ounces, and after the lapse of a few hours—not, at the utmost, more than twenty-four—let the remaining ounce of collodion be added. In the case of an emulsion that has already been fully sensitised, and found to be wanting in vigour, add sufficient silver for a definite quantity of collodion, which can then be added after the necessary interval of time. In either of these cases it will be found safer to make a further addition of a small quantity of either citric or nitric acid, in order to guard against fog—one grain of the former, or half a minim of the latter, to each ounce of emulsion.

In "doctoring" an imperfect emulsion under such circumstances there is no actual loss, except, perhaps, of the time occupied in the task; but with a washed emulsion the case is different, since it will be invariably necessary to re-wash it after the remedial treatment if it is to be again used as a washed emulsion, and in any case, even if subsequently employed as an unwashed preparation, the first batch of solvents are lost. In this case, supposing the pyroxyline in the first case to be suitable, the result is due to the removal of the organic silver element through improper treatment in washing, and if such only be the cause it will usually be sufficient to add a fresh quantity of bromised collodion, and to re-sensitise with the proportion of silver necessary for the added quantity. If, however, the pyroxyline be unsuitable for washing, the defective emulsion can only be utilised by re-sensitising it as an unwashed emulsion, as, even if mixed with the most perfect collodion possible for the purpose, it would only, in re-washing, lower the quality of the latter, if indeed it did not reduce it to its own level.

There is one other way in which such an emulsion may be usefully employed, and that is in modifying the structural character of another. It very often happens, especially in the case of unwashed emulsion, that the only fault to be found is in the structural character, a "crapy" or, perhaps, a "mottled" appearance of the film marring an otherwise perfect image. As a rule such qualities are accompanied by a ready tendency to give any amount of vigour or density under development, while the structural characteristics that accompany the want of density of an over-washed emulsion are the very reverse of those above mentioned, and the two preparations may often be mixed with the most satisfactory results, and to their mutual improvement.

But defective emulsions, whether washed or unwashed, whether merely wanting in density or badly fogged, may be utilised in an entirely different manner, and with advantages that do not attach to the methods already given. The plan we are about to describe partakes of the character of a cross between the wet and emulsion processes, and, while possessing certain features of each, is free from the principal troubles and difficulties of both. The wet process, as is well known, is still largely used for some purposes, but chiefly for negatives for "process" work and for lantern slides, and, especially for the latter purpose, would, no doubt, be still more generally employed if it were not for the trouble involved in the management of the bath. Again, many who at the present time use the wet-collodion process on account of the quality of result obtained would gladly substitute an emulsion if only the same rapidity of working could be combined with the quality of wet collodion, even if the emulsion had to be employed in the wet state. The modifications we are about to describe will, we think, fulfill the requirements.

Briefly stated, the method consists in using the emulsion, after it has been suitably treated to relieve it of its defects and faults, as a partially sensitised collodion, treating it with a solution of silver, which does not necessitate the nicely balanced conditions essential in the ordinary silver bath, and developing either by the acid-silver or alkaline methods as may be preferred, though, of course, a variation in the method of working will be necessary in the two cases. From personal use of this process, we can recommend it as something more than a mere makeshift method of saving a spoilt emulsion, for it actually constitutes an easy means of securing all the advantages of collodion without the trouble and anxiety that undoubtedly attend the use of the bath, especially if not kept in order by regular use.

After all, in adopting such a measure we are only reverting to the principle recommended many years ago as a decided gain by whom we forget at the moment—of partially sensitising the collodion by the addition of a few drops of silver solution. In that case, however, the quantity of silver added to the collodion was relatively minute, being little more than as much as the soluble haloids in the collodion would take up and dissolve; in fact, the idea was to saturate the collodion with silver in the same way as the bath. The result was claimed to be a decided gain in sensitiveness, as well, if we remember rightly, as other advantages.

As to the practicability or utility of collodion emulsion used wet, there can be no doubt, though, as generally used—with an alkaline or other organifier and alkaline development—the results have scarcely been found to equal those obtainable with wet collodion and the bath. But the modified conditions under which we propose to work place the process upon an entirely different footing. The late Thomas Sutton, it will be remembered by our older readers, published a number of experiments in connexion with plain bromide of silver films, both in the form of wet and emulsion plates, and with iron and silver, as well as alkaline, development; and the results he obtained were decidedly in favour of the "new wet-collodion process" of that day. But the chief objection, if not the only one, to his process was the necessity for an abnormally strong silver bath—from 80 to 120 grains of silver nitrate to the ounce—which the strongly bromised collodion, aided by the low combining equivalent of bromine, involved. Otherwise, in point of quality of result and sensitiveness, Mr. Sutton's plates were at least quite equal to ordinary wet collodion.

Now, in utilising an emulsion in the manner we suggest, the difficulty of the strong bath is entirely overcome; for the bulk of the bromide of silver is formed in the collodion itself, with a comparatively small excess of soluble haloid to confer keeping qualities. The final sensitising, which also imparts the necessary stimulus of free silver to give rapidity, is done with a weak solution of silver

that, beyond being *clean*, requires none of the care and attention that the old silver bath did; and the resulting plates can be treated in every way as ordinary wet plates, if so desired, or, if preferred, as extra-sensitive dry plates.

(*To be continued.*)

AMERICAN NOTES AND NEWS.

The Heliochromoscope.—Mr. F. E. Ives writes to the editor of the *Photographic Times* that he has succeeded in constructing a heliochromoscope, in which the same triple positives used for projecting in the lantern are focussed upon the retina of the eye, as a single picture in the natural colours. "I can, therefore, now demonstrate the process at a minute's notice," says Mr. Ives, "sun or no sun."

New American Journals.—Still they come! the "they" in this case being the *Canadian Photographic Journal*, published at Toronto; and the *Pacific Coast Photographer*, issued from San Francisco. The last-named contains an article on plain paper prints, with one of which it is embellished, and a charming study it makes. This practical illustration of practical articles is a feature deserving of wide imitation.

Chicago Meeting of the Photographers' Association of America.—The Photographers' Association of America does not meeet this year; but the Executive Committee, at a recent meeting, have fixed upon Chicago as their place of meeting for 1893. The presumption is that there will be a good attendance, and, as several photographers from Europe will, doubtless, be visiting the World's Fair, a cosmopolitan fraternisation may be expected to take place on the occasion.

Insoluble Gelatine Prints.—The Editor of the *St. Louis and Canadian Photographer* acknowledges receipt of some gelatine prints that water will not affect, the paper being perfectly waterproof, and the "emulsion insoluble in boiling water." "It" (? the coated paper) "may be boiled continuously without in the least producing the slightest injury or softening of the emulsion. It does seem," remarks our contemporary, "as though perfection has been reached at last in a printing-out paper." But why boil gelatine prints, or employ water at such an abnormal temperature in their manipulation? and, consequently, where is the advantage of the insolubility?

"Looking Backward."—The veteran photographer, Abraham Bogardus, has been indulging in this fascinating recreation, and has some funny things to tell us. One Dr. Jacobson published the hypothesis *apropos* of a new paper (temp. 1860), that a special kind of hens were fed on nitrate of silver, and so produced, in an organic way, the albumenate of silver. . . . When the hens cease laying, their carcases were worked up the same as other silver residues! At or about the same time a Kentucky man claimed to have discovered photography in natural colours; "common salt" was recommended as a cure for blisters; "several new developers were introduced every month," and the "given away with a pound of tea" principle was in full blast in cheap photography. On the whole, excepting the above highly ingenious hypothesis, things are pretty much to-day as they were twenty-six years ago.

An American Photographic Dinner.—Mr. Henry J. Newton presided at the annual dinner of the Photographic Section of the American Institute a few weeks ago. Proposing a toast, he invited all who liked cold water to drink it. He did not exactly know the programme of the evening, as the Chairman of the Committee was at the other end of the table, and he (Mr. Newton) could not see him without an opera-glass! It must have been a large party. Then, after a joke or two, the President asked for information about orthochromatic plates. Dr. A. H. Elliott obliged in a speech of about a column and a quarter, and Dr. C. H. Ehrmann followed suit in an oration of double that length. The report of the dinner, according to *Anthony's Bulletin*, in which it appeared, was "to be continued." The President, at the outset, supposed "the speeches would be dry." They were. Fancy, about four columns and a half of the orthochromatic process at an English photographic dinner! Alas, it is occasionally something more than fancy; it is grim fact! Hence we can compassionate our American brethren who had to sit under the four-and-a-half columns.

FOREIGN PHOTOGRAPHIC INSTITUTIONS AND THEIR INFLUENCE.

[London and]Provincial Photographic Association.]

THE original intention in relation to this paper was to make it heavier, by the introduction of statistics and by entering into more minute details about foreign photographic institutions, but exceptional pressure of other engagements during the past two weeks left me no time to search out the necessary documents for reference. I should have liked the postponement of its reading, but felt that that course would disturb your arrangements, especially as Mr. Warnerke had set apart this evening to bring here an interesting collection of lantern slides bearing upon the subject. Perhaps, after all, the colloquial narrative about to be given in relation to foreign institutions I have visited, may be less tiring to the listeners than if the paper were of a heavier nature.

Recently Mr. Warnerke gave the Photographic Society a valuable memoir upon practically the same subject, and spoke only of what he had seen himself. The present paper may be considered an unauthorised appendix to his, and, if others acquainted with Continental photographic institutions will hereafter contribute their share of information, a body of facts will have been collected which seems to be publicly required at the present time.

BELGIAN PHOTOGRAPHIC SOCIETIES.

The nearest foreign country to England in which there is much photographic activity within easy distance of London is Belgium, a nation known for holiday-making to many here present, several of whom, however, have not given attention to its photographic societies, or rather to its photographic association, for, practically speaking, it has but one, all the branches of which are federated. This system has worked well for a long course of years. The head of the Association is Mr. J. Maes, of Antwerp; its headquarters are in Brussels, and its Secretary General is Mr. Charles Puttemans. Mr. Maes is the chief photo-mechanical printer in Belgium, and for printing he uses French and German machines. He is also President of the Antwerp section of the Association. Mr. A. de Blochouse is President of the Brussels section; he is a retired engineering photographer, and one of the most popular men connected with photography in Belgium. Some years ago I was much indebted to him for information about the state of photography in his country. The Ghent section is under the presidency of Professor De Vylder. The Liège section is under the presidency of Mr. Raoult, and holds its meetings in the University, in the scientific department of which it is surrounded by all the facilities for research which the photographic mind could desire. On inspecting its domicile, I wished that we had something in any degree approaching it at home. One result of the general union of Belgian societies is, that the Association has but one journal to serve all, so that, with this concentration of effort, the *Bulletin Belge* is one of the best photographic journals in the world, and it received a special award on that account at the last Paris Exhibition. Captain Abney once contributed to its columns with considerable regularity. No personal disputes or particulars of dissensions find a place in its pages, and the chief photographic journals of the world are carefully searched every week for any items of novelty, brief summaries of which are printed regularly at the end of the *Bulletin*. It is scientific in its tone, and adapted to the requirements of the scientific mind; but, then, it must be remembered that the average education of the Belgian people is high. Boys and girls, even in agricultural villages, are commonly enough taught three living languages, and pretty well taught too, as I know from conversations with some of the children. At Ghent, photography in some of its more difficult branches is taught to the chemical students in the University by Professor Donny; for instance, he teaches them how to produce ceramic photographs. He is a photographer of long standing, for a letter from him on the subject is to be found in the first volume of our Photographic Society. Ghent claims the honour of being the city which first began to put into practice the free-education system which so long since has spread over a considerable portion of Continental Europe. Its inhabitants, it may perhaps here be mentioned, have a great love of flowers, and

its floriculturists spare no expense in obtaining the rarest flora curiosities.

Quite recently I spoke at the Photographic Society about the Government School of Photography at Brussels; how it gives long courses of lectures on photography free, and provides for serious students the free use of costly instruments for photographic research, so that it is unnecessary to say more upon that subject here.

A short distance south of Brussels is the Military Map Department of the Belgian Government, in which photo-mechanical processes are extensively used.

The next meeting of the International Photographic Congress will be held at Antwerp, a most convenient place to reach from London. Having tried all of them, I prefer the Harwich route, which is far different from what it was in the days of old. Should British photographers visiting Belgium wish to inspect its photographic institutions, if they meet the same kindness there which I have received, they will have no reason for complaint.

French Photographic Societies.

Turn we now to

"The land of France,
The chosen home of chivalry, the garden of romance."

The Photographic Society of France meets once a month upon premises of its own, 76, Rue des Petits Champs, Paris. The salon in which its public meetings are held has a rich collection upon its walls of photographs of high historical value, and it is meet that such should be the case in the country of the chief founder of photography, Niépce de Châlons; also the country of Daguerre. In the collection are several beautiful photographs in pigments by Ducos du Hauron by the ingenious process which has been so often reinvented, sometimes with modifications or improvements, in this and other countries. Its president is Dr. Janssen. This Society is not parochial in its work, and believes that something good in photography may be done out of France, consequently a summary of anything new in photography appearing in any foreign journals is briefly brought under the notice of the next meeting. There is a moderate amount of formality in the proceedings at the meetings, but not more perhaps than is necessary to secure expedition in doing the work. This Society took an active part in founding the International Photographic Congress, which was but one of, say, thirty or fifty International Congresses held at Paris during the last Exhibition there, when all the world and his wife were in the gay capital; consequently the time and place were as convenient as any which could have been found, and I think that the members of most scientific bodies were thankful that the Parisians brought them together by means of those Congresses. The *Bulletin* of the Société Française de Photographie is carried on upon strictly scientific lines, and is rich in contributions of permanent historical value.

I have also visited the photographic societies of Nantes, Havre, and Douai, all of them chiefly composed of amateurs. At Douai the society holds its meetings, and has rooms, in the Museum. A portion of the building is devoted to chemistry and physicul science; so this Society has all facilities for demonstrations and research. It is an interesting Society, and has some unique literary and pictorial records of its own, contributed by men of exceptional ability. It writes and lithographs its own journal, as also does the Photographic Society of Versailles. A man whose handwriting is clearly legible copies that which is selected for publication, and the pages are printed off in the lithographic press.

A few weeks back a letter appeared in the photographic press from a resident in Havre, to the effect that he had a dark room for the use of strangers. That is all very well; but, judging by recent occurrences in France, what is likely to be the fate of any photographer who takes pictures in the great shipping port of France, with its adjacent fortifications? I once put this question to some members of the Havre Photographic Society, who said that they "thought" that any foreigner might photograph inside the town, but they would make inquiries and let me know later on by post. That information never came. In many parts of Havre the heights behind the town form the background to the street scenes, and, if guns chance to be upon those heights, what will be the fate of those innocent strangers who venture to take snap-shots in the street with a camera? In places not near the frontier the Germans would simply bully such strangers, and tell them to be off; but the results of doing the same thing in France would be more prolonged and more unpleasant especially in small places in which the local magnate has a concentrated sense of his own dignity. If these small gentry be not spoken to with abject humility, they will swell up like Mr. Maskell's cat. Officialism is overdone in France; among the higher officials are plenty of thorough gentlemen, and among the lower are some—but a few in number, I hope—who are the reverse.

The Photographic Society of Havre has a nice building of its own in the eastern part of the town; the members I have met gave me every cause to remember the meeting with pleasure. An exhibition of the work of the members was going at the time, and attracted great numbers of the townspeople to an extent beyond the anticipations of the Society.

At Lille, in the Hall of the Sugars, is an interesting collection of early photographs and photographic objects of interest. In another public institution in the town, as I have been informed by Mr. William England, are two old pictures, not photographs, proving that the way to produce stereoscopic effects was known long before the time of the supposed modern invention. On two occasions, when in Lille, I tried, without success, to discover the whereabouts of these pictures, not possessing the name of the place in which they were kept. Some changes were being made in the art galleries of Lille at the time, which may account for my not finding them. In past times I have now and then seen notices of them in books, but forgot where.

The Nantes Society publishes its own proceedings. The country between Tours and Nantes well deserves the attention of photographic tourists—especially the towns of Chinon and Angers, with their magnificent old castles. From the neighbourhood of Angers came the Plantagenets. This region is the garden of France.

Photography in Switzerland.

In Switzerland the head-quarters of photography are at Geneva The *Revue Suisse* is published there, and the Photographic Society of Geneva flourishes in the city. In the autumn of 1890 it held an excellent exhibition, and some large heads by the carbon process, exhibited by A. Ruffo, Prince de la Scaletta, of Rome, were unique, so far as my experience goes, which, in comparison with the experience of some of those I see around me, does not count for much. They have an indescribable, but distinct, character of their own, a character as well marked out from the ordinary run of photographs as have those of Mrs. Cameron. M. Nerdinger is the president of the Geneva Photographic Society. The Swiss photographic societies are united somewhat in the same manner as the Belgian societies, in the matter of the publication of their proceedings in one journal, the *Revue Suisse*.

The well-known photographer, Mr. Pricam, of Geneva, is the president of the Swiss Photographic Society, an organization dealing with the commercial interests of Swiss professional photographers. I do not think that they could have found a better man for the position. He was one of the photographic jury at the Paris Exhibition, and he attended the last Brussels Congress. Mr. Warnerke has his likeness.

During a few hours' stay in Neuchâtel I was unable to find any of the officers of the society; they were mostly university men and in vacation at the time. At Lausanne I had no time to make the attempt so to do.

We come now to Zürich, the chief commercial city in Switzerland. The Polytechnic School there is known by reputation or otherwise throughout the world to those persons who are interested in the subject of national education. Its students have to take a three years' course of instruction at the cost of four pounds a year, for which they may be taught chemistry, civil engineering, railway engineering, architecture, or some one or other of the learned professions. The candidates for admission must be able to pass what in Switzerland is considered an elementary examination; they must have a knowledge of mathematics, and of two living languages in addition to their own The benefits of this institution are not confined to the Swiss people who keep it up, for students from any part of the world are received upon the same terms. Altogether during my visit to visit to Zürich I spent much time in the establishment collecting information about it, and chiefly from Dr. Georg Lunge, one of the best of living chemists, and a noted authority upon alkali manufacture. He knows England well; in fact, he lived in this country for several years.

At the time of my stay in Zürich there was no photographic society in the city, but one has been established there since. At the Polytechnic School was a developing room for the general use of students.

In Italy photographic Societies are of recent date. There are but few in the whole nation, and the first one was established at Florence about six or eight years ago, as the outcome of a successful photographic exhibition in that city. I have not chanced to be in any Italian town at the same time that it possessed a photographic society At Turin is an excellent Photographic Club, which prints a good journal of its own.

Influence of Foreign Photographic Institutions.

The influence which foreign photographic and other educational institutions exert in these days of commercial competition seems plain enough. Suppose a young Englishman, possessing the average education given to the bulk of the people in this country, and the averag

knowledge of photography learnt under the teaching of an average professional photographer, to go "out West" in the United States, and to settle down in some new town, in which he has but one competitor, a young Belgian. The latter we assume to have been taught three living languages, to have been taught, not alone practical photography, but its underlying laws and principles, to have been taught optics and chemistry, the use of high-class instruments for photographic research, to have been trained in drawing and painting, and all this at remarkably small expense. In Ghent, for instance, which is not a particularly large place, he has every facility provided for inexpensively acquiring all the knowledge just stated. Suppose all other conditions of the two individuals but those just stated to be equal, which is likely to become the victor in the race of life? The Belgian, say I. In modern civilised society, education takes the place which weapons and physical strength take among savages. In these days the properly educated man is the strong man armed, and that, too, with a weapon which cannot be taken from him, whilst his uneducated brother is more likely to be a sheep to be shorn. A man who growls about the cost of general education is like a savage who tries to make other savages go unarmed, because of the expense in money or labour of acquiring weapons. Mr. H. M. Elder has told us how certain English photographic firms have been obliged to send to Germany for some of their best men; I have seen photo-mechanical work for London customers in the act of being printed in Germany, and I know of one great photographic firm in London now employing some of Goupil's former men, because of their practical skill. Too large a proportion of useful photographic novelties comes from abroad. The plodding, heavy kind of tradesman says to the inquirer: "I do not keep such-and-such a thing; there is no demand for it." Yet the thing may be obviously useful, and it is not the business of the public to go down on its knees to home dealers to supply useful things they will not otherwise keep; it is simpler to go to a dealer in foreign goods, when he chances to have something meritoriously useful, which he introduces in the hope that the public will recognise its value. Much more might be said on this part of the subject, but at this hour what has been said is sufficient to start a discussion.

"You have no personal practical knowledge of the action of these commercial influences in photography," says—or ought to say—an objector. That is true, so upon this branch of my subject I come here as much to be taught as to teach; therefore, will now sit down in this chair, preparatory to being sat upon by you after our chairman has exhibited his interesting lantern slides. As you are just, so be merciful.

W. H. Harrison.

PHOTOGRAPHY AND PHOTO-MECHANICAL PRINTING.

I.

[Two Lectures delivered before the Officers of the Royal Engineers at the Military School, Chatham.]

For the purposes of my paper on photo-mechanical printing processes it is not necessary for me to go very deeply into matters connected with the discovery and general history of photography, neither will it be necessary for me to attempt to go into detail on the elaborate chemical changes which occur in the processes I shall describe, and by the study of which, step by step, the present exact knowledge has been attained of the wonderful action of light on various organic salts. It will be sufficient for my present purpose if I give you a short *résumé* of the first researches made as to the chemical action of light on some of the substances employed in photography, briefly explaining as I go along what these chemical changes are and their effect, so that you will better understand the phenomena of the experiments I shall show you. For details of the photo-mechanical printing processes I shall introduce to you I cannot do better than advise you to study one or other of the special text books published on the subject. Those amongst you who desire to make a scientific study of the art will do well to obtain the excellent works of Hardwich & Dawson, Captain Abney, R.E., W. K. Burton, and others, whose researches into the cause and effect of light action have been most exhausting and most interesting.

Action of Light on Silver Salts.

I suppose you all know, except the little boy in the corner, for whom my paper is intended as well as your scientific selves, that the word photography means literally *writing by means of light*, and it includes all processes by which any kind of a picture may be obtained by the chemical agency of light. The ancients knew hardly anything about the subject except, perhaps, that a substance which they called "horn of silver" blackened when exposed to light. In 1777 a clever Swedish chemist called Scheele made some researches as to the decomposing action of light on compounds of silver, and he found that this decomposing action was greatest in the violet end of the spectrum; he also attributed the blackening of chloride of silver to the liberation of chlorine and the formation of hydrochloric acid, which theories were quite correct, but very little notice was taken of the discoveries at the time, they were looked upon as mere curiosities. About thirty years later, in 1802 Wedgwood and Davy attempted to utilise silver salts for picture-making purposes, and, curiously enough, they practically employed the very methods in use to-day in their experiments. They soaked sheets of paper in nitrate of silver, and projected a shadow of the object they wished to copy upon it. The parts of the paper upon which the shadow fell remained white, whilst the parts exposed to the sun's rays gradually turned dark, the result being a negative image of the object shadowed or photographed.

Here is a piece of paper treated as above, showing approximately the effect of Wedgwood and Davy's researches. Up to this time, however, and for perhaps thirty years later, no method of fixing these light pictures was discovered; consequently, they could only be examined in a dull light, and, unless kept in the dark, soon disappeared altogether. In 1821 Herschell announced that hyposulphite of soda would dissolve the haloid salts of silver, but the fact seems to have been overlooked until Fox-Talbot's investigations brought the matter to a practical application in 1839 in his Talbotype process. Talbot made great advances in photographic science, and found how to make pictures in the camera, the images of which were invisible when made, but were capable of development afterwards. Contemporaneously with the experiments of the Englishmen named, Daguerre and Niépce in France were making successful researches into photographic picture-making, one by the well-known and beautiful process bearing the name of Daguerreotype, the basis of which was a plate of silver, having upon its surface a thin film of iodine, which substance, combining with the metallic silver of the plate, produced Iodide of silver (a salt highly sensitive to light). The plate thus prepared was exposed in the camera, and the image obtained, though invisible at this stage, appeared on the plate on its being submitted to the fumes of mercury. This production of a latent image capable of development was of the first importance, as it reduced the exposure in the camera from hours to minutes, and, in conjunction with Fox Talbot's process, opened the door to a whole range of discoveries, the mere naming of which would occupy the whole time at my disposal this evening.

Mr. Fox-Talbot was the first experimentalist who succeeded in making what is technically known as a negative, and in 1850 Mr. Archer discovered our present collodion process for making negatives.

Collodion is a thin, syrupy solution of pyroxyline or gun cotton, dissolved in ether and alcohol, and it is used as a vehicle to carry the haloid salts of silver on the glass negative. We will dissolve a little cotton in ether and alcohol to show you how rapidly the prepared vegetable fibres are dissolved by the solvents. To this solution is added bromide and Iodide salts, and it is then poured over a glass plate, and the plate is dipped for a few minutes into a bath containing about thirty-five grains of nitrate of silver to each ounce of water. The silver in the water combines with the bromides and Iodides in the collodion, and forms double salts which are sensitive to light. The plate in this state is ready for exposure in the camera, and is what is generally known as the "wet-plate" or "collodion" process, in contradistinction to the now better-known gelatine or dry plate.

A negative is a transparent picture having the lights and shades reversed. Here is a negative, and you see that those parts corresponding to the dark portion of the original are transparent, whereas those parts which correspond to the lights of the original are opaque. Here, on the other hand, is a positive or transparency of the same subject as the negative which you have just seen, the lights and shades of this being the same as the object represented. A negative from nature should show the reverse of all those gradations of light and shade which characterise natural objects, while a negative taken from a line engraving should show only two gradations, complete opacity and clear transparency. Here is such a negative as is in use for all classes of photo-mechanical processes in line.

The Bichromate Processes.

The discovery by Mungo Ponton in 1839 that bichromate of potash could be used for making paper sensitive to light was of immediate importance. There is scarcely a photo-mechanical process in existence which is not more or less dependent on the action of one or other of the bichromates in combination with an organic substance, such as albumen, gelatine, and starch.

Were it not for the curious action light exerts on organic substances charged with a small proportion of bichromate, a whole range of beautiful

processes now in every-day use would be impossible. Pigment printing by means of the carbon process, photo-lithography, photo-zincography, photo-etching and engraving, Woodburytype, collotype, and a host of lesser processes, are one and all entirely based on the effects imparted by salts of chromium to organic matters, such, for instance, as gum, glue, gelatine, isinglass, starch, dextrine, &c. To explain to you the action of light on any one of these substances when treated with bichromate, we have prepared some sheets of paper with a coating of ordinary gelatine. This sheet of gelatine paper has not been treated with bichromate, and it can be exposed to light indefinitely without affecting its nature. This sheet has acquired the property of becoming sensitive to light by being soaked for a few minutes in a three per cent. solution of bichromate of potassium in water, and dried. The light acts in two definite ways on bichromated gelatine prepared as described, first, by rendering it insoluble; second, by causing it to lose its property of absorbing water or swelling; and these peculiar properties are seized upon by the scientific photographer, and utilised by him in the making of many wonderful picture-producing surfaces. Now, this piece of bichromatised gelatine paper has been exposed to daylight under this negative for five minutes this afternoon, and if you examine it you will find a faint image of the lines of the picture. If I dip the piece of paper in water, and let it soak a few moments, a marked effect is produced. The unused bichromate in the paper dissolves out into the water, and the unacted upon gelatine swells, but the parts represented by the clear lines of the negative, and oxidised by light, remain unswollen, non-absorbent, and sunk; that is to say, if this piece of paper were laid on a flat surface, and plaster of Paris poured upon it, we should get a cast in relief showing every line of the original drawing, from which, by recasting in metal, we might obtain, by this means alone, a stereotype plate for printing with type. Many excellent processes for type-block making are worked on this principle. Now, another valuable property of this same gelatine, when sensitised and printed, is its affinity for taking greasy ink where light has acted, and refusing to take ink where light has not acted. Sapper Royall will take a printing roller charged with ink, and coat a similar piece of exposed gelatine paper with ink all over—when dry, it can be inked all over—and Mr. Geddes will afterwards soak the paper in water, when you will observe that with a slight rubbing the ink will leave the gelatined paper everywhere, except on the parts acted upon by light.

The inked photograph of the lines of the negative on gelatine paper, made in the way shown to you, is technically called a "transfer," because it is used for the purpose of transferring the ink on its surface to a lithographic stone or a grained zinc plate, from which base the image or lines thus transferred can be further inked and strengthened, after which treatment the stone or plate is placed in an ordinary lithographic printing press, and any number of copies printed in the usual manner. When I say "usual manner," I am presuming that you understand generally what ordinary lithographic printing is, and that you have also some idea of its principles. Perhaps, after all, it would be safer if I do not "presume" anything (in case any of you have forgotten), and I will just run over very briefly the manipulations of simple lithographic printing. (To describe it properly would involve a paper thrice the length of the present one.)

Lithographic Printing.

Solenhofen slate is a porous limestone which has obtained the name of lithographic stone from its capability of being used as a printing surface, from which an indefinite number of copies of any drawing or transferred picture can be taken. This stone is polished smooth and level for use, and it possesses the property of greedily absorbing both greasy ink and water; if a drawing is made upon it with an ink made of grease and lampblack dissolved in soap, the grease sinks into the stone, and each line so drawn forms a permanent printing surface, which will "take" more ink from an inked roller, and then give up a portion of the ink to a sheet of paper pressed in contact with the face of the stone. To prevent the stone inking all over when using a roller, the stone is damped before rolling up with a sponge and water; the stone absorbs water everywhere except where the lines occur, which, being greasy, repel water. You see, therefore, that the principle of lithographic printing is simply employing a surface which "takes" ink, and ink only where there is already ink, and water, and water only where there is already water.

Here is a lithographic stone on which a drawing has been made, also a similar stone upon which a photo-lithographic transfer has been impressed, as well as proof from both stones. You will observe that there is practically no difference in the results, one subject being laboriously drawn by hand line by line, and the other the result of photographing a print or a drawing which has been much more easily obtained.

I will now take another similar sheet of transfer paper which has been already washed and inked up, and will pass it through the transfer press so that you may see the exact method of treating these transfers. I, however, will not use a stone, but a sheet of zinc, which possesses the same properties as lithographic stone, but is more convenient for the purpose this evening. You will see that the ink leaves the gelatine surface of the paper, and attaches itself to the metal or stone. If the transfer is successful, we will pull a few copies to show the complete process.

I mentioned in the historical notes that Niépce had discovered the fact that bitumen or ordinary asphalt was sensitive to light. As I still have some time, I will make a short *résumé* of this process.

The process is extremely simple, ordinary bitumen or asphalt is dissolved in benzol, and a metal plate is covered with a thin varnish of the substance.

Niépce employed this method for the purpose of making pictures on glass, but we use the bitumen now entirely for obtaining an acid-resisting image on metal for etching or engraving purposes.

Here is one of these plates ready for use. Exposure to light has the effect of rendering the bitumen varnish insoluble in certain essential oils in which, previous to its exposure to light, it was quite soluble. This singular property is utilised in our modern processes for producing the delicate images on metal of drawings in line, which are afterwards etched by acids either for typographic blocks or intaglio plates. The plate which I handed round to you just now has been exposed to the action of light under a negative of a line drawing, and, though there is no image visible, I will now show you the effect of a little common turpentine over a portion of the plate. Here is the drawing and the negative made from it, under which the plate has been exposed. You see that the turpentine at once dissolves and removes the portion of bitumen which were protected from light by the negative, but it has no effect upon the parts acted on by light, and represented by the clear portion of the negative and by corresponding lines on the metal plate. To-morrow I shall have the pleasure of describing to you how by etching such a plate as Niépce's, we can convert it into a block for printing with type in a printing press.

Niépce's discovery, about the year 1825, of the curious effect of light on bitumen is very interesting from the fact that the process, only slightly modified, is employed to-day for the production of some of our finest photo-etched plates. I believe there are in the British Museum some specimens of Niépce's bitumen plates showing his attempts at etching quite half a century before there was any practical use made of them.

One of the most beautiful processes, namely, photogravure, was largely dependent in its beginning upon this action of light on bitumen.

Photogravure.

Photo-intaglio engraving is, as its name implies, just the opposite in effect to the photo-relief blocks, which I shall describe to-morrow evening, the principles are the same, however, and the difference in result is obtained by using a positive or transparency for obtaining the pictures on metal (instead of a negative), and by etching away the lines themselves instead of the metal surrounding them. I have here a copper plate with the picture on the metal printed from a positive, and a plate upon which a similar picture has been etched, so that you can see at a glance how the results are attained.

The simplest way of obtaining a photogravure plate of a line subject is to coat a piece of copper with a thin solution of bitumen in benzol, and expose this plate under a clear, sharp transparency in a printing frame. The exposure will take about an hour in a good light. After exposure the image is developed with a little turpentine, and on the dissolving away of the unacted upon parts represented by the lines on the transparency, the picture will appear as bare metal on a ground of bitumen varnish. On applying an etching solution of perchloride of iron to the surface of such a plate, the etching solution at once attacks the portions of metal bared by the developer, and quickly bites out the lines to a sufficient depth to permit of the plate being inked in and printed from. If the subject required is in gradations of tone, like a portrait or a landscape photographed from nature, then a different treatment is necessary, and the following method is perhaps the best. From the transparency, or positive, of the tone negative a print is made in carbon, exactly in the same manner as if one were making an ordinary print; but, instead of developing the carbon print on paper, it is developed direct on to a copper plate, which has previously had a fine grain of resin deposited and melted upon it. A grain of some kind is necessary on all half-tone photogravures, because without it there would not be sufficient texture in the etched pictures to hold the quantity of ink necessary to give a vigorous print. After the carbon print of the transparency is developed and dry, it should present the appearance of the plate which I handed round to you, and it is ready for the etching fluid, which is again perchloride of iron. A little practice is necessary in order to determine the right

strength of the etching solution, as well as to judge properly the exact moment when to stop the operation of etching, because, if the solution is too strong, it will only etch the deepest shadows, and if it is too weak it will etch too quickly all over the surface, and give a flat, thin picture. Here is a plate which is fairly well etched, together with some proofs. The plate, you will observe, is steel faced, which is always advisable; the hard facing protects the delicate details from being too rapidly worn away in the printing.

PAUL L. WATERLOW.

STEREOSCOPIC PHOTOGRAPHY.—A REPLY TO MR. J. C. ANNAN.

PROMPTED by a desire to introduce a discussion, viz., "to inquire into the reason for the present revival of stereoscopic work amongst the photographic fraternity," Mr. J. C. Annan made a communication to the Glasgow Photographic Association a few days ago, and which was published in this JOURNAL last week. I see by the report that the discussion which followed was "animated," but it is a pity the "animated discussion" has not been published. But let us consider what Mr. Annan has said.

We are told there are several classes of photographers, and these Mr. Annan divides into three. "The first is the professional, who does stereoscopic work to satisfy an eager public demand to buy them for the entertainment of their friends in the drawing-room." Well, now, from a professional standpoint, is this not one grand testimonial to stereoscopic photography, and the fact that there is an "eager demand?" That they suit the public taste is another point in favour.

The next class of photographer, Mr. Annan says, is the amateur, "who photographs because he desires a relief from the monotony or worry of his daily avocation, &c., and this class hail stereoscopic work as a delightful variety, and *naturally* become enthusiastic over it." (Italics mine.) "They rephotograph many old views, and show their results to admiring friends, who expatiate on the marvellous reality of the appearance."

Now, I ask again, Is this not another point in favour of stereoscopic photography, or are all our "admiring friends" devoid of taste, without soul or artistic feeling, humbugs, or idiots?

The third class of photographer, we are told, photographs for results; they have a soul beyond the dark room. "Their albums are the real end of their work; they like to have pictures of places visited to remind them of a happy holiday, and to be able to illustrate their private and public lectures to less fortunate brethren." Now, in the name of goodness, cannot all this be done from stereoscopic negatives? "A wave, a cloud, the outline of a hill, or a tree branch, is ever a pleasure to them." What nonsense all this attempt at poetry or art is, to be sure. The stereoscope will show the wave, the cloud, or the branch of a tree, far better than most pictures to be found in albums. Before we try to be poetical in photography, we had better be practical. Then, the albums of ninety-nine out of every one hundred amateur photographers are not fit to be seen; they are, as a rule, the receptacle of early efforts and prints that are not good enough to mount in any other way, though sometimes an album may contain reminiscences of holiday rambles; and we can do all this by printing from one end of a stereoscopic negative.

I have before me as I write a stereoscope and a box of fifty stereoscopic slides (glass transparencies) made from negatives taken on a holiday tour. Near the box is an album, containing fifty platinotype prints (quarter-plate size), printed from one end of the same stereoscopic negatives. My friends who visit me have, I believe, the average intelligence of the human race, and dozens of times I have experimented upon their tastes by giving them first the album to look through, and generally in five or six minutes they are satisfied; but the very same persons will often spend as much time looking at one stereoscopic slide, and sometimes longer, if I don't hurry them along, and, when these same friends revisit me, they ask to see my stereoscopic transparencies again; but they never ask to see the album at all. Now, how is this? Let us see what Mr. Annan says again.

In the first place, he submits, "it is impossible to appreciate the artistic qualities of a photograph through any mechanical contrivance, and that to enjoy a work of art the mind must be untrammelled by anything outside of it, for the disturbance created by the necessary fixing of the parts, the adjustment of focus, &c., is a source of irritation which prevents the enjoyment of the beauties of the picture;" and these things are the initial objections of Mr. Annan to the stereoscope.

Now, it is a fact that, in the old days of the stereoscope, thousands of slides were made so very incorrectly, and these, when viewed by stereoscopes, which were equally defective, caused considerable trouble, and undoubtedly did represent natural objects in a very unnatural way, as stage set-scenes or little models.

But all this wrong-doing of the past need not be repeated. There is no necessity for this "fixing" and what is usually understood (erroneously) to be "adjusting the focus." I say again, with emphasis, that with correctly printed slides and properly constructed stereoscopes there is no occasion for any trouble or irritation such as has been mentioned.

But there is a fourth class of photographer not mentioned by Mr. Annan whom I must now introduce. This class of photographer has a propensity for doing things without thinking, and for talking and writing about art, atmospheric renderings, optical, and other matters of which they have but a very limited understanding, and it is such gentlemen whom the student in stereoscopic photography has most to fear in leading them astray.

Mr. Annan asks us "to imagine an artist painting a picture of a view which he looked at through a telescope." Now, this is a remark quite misleading, for it has no bearing whatever on the stereoscope, but might well be applied to taking single pictures with a lens of too long a focus.

Mr. Annan says: "In nature it is impossible to see objects near at hand and objects at a distance in focus at the same time; in the stereoscope, however, the several planes are all seen in focus at once, and thus the effect aimed at by one means is directly annulled by another, with the result that the various planes seem flat portions supported by a little space from each other."

Here we have an instance of the fourth class of photographer whom I have introduced in this short article, and where a little learning is shown to be a dangerous thing. In the first part of the above paragraph Mr. Annan is correct, but in what he says he sees in the stereoscope he is all wrong.

"Focus," or the "several planes seen in focus at once," has nothing whatever to do with the subject. If we look at a natural object five yards away, and then turn our attention to another object fifty yards beyond, we undoubtedly alter the focus of our eyes; but this alteration of focus gives us no idea or appreciation of distance.

It is a fact that "the mind can only concentrate itself on one object at a time," but it is incorrect "that, if an endeavour be made to look at a near object and at a distant object together, it will be possible to do so."

Next, we are treated to some incoherent remarks about atmospheric impressions, and what the painters do, and to which I need not reply further than to say that, if it be possible to obtain atmospheric effects in a single photograph taken by one lens, surely it is equally possible to obtain similar effects in two other pictures made by two other lenses. Then, as I have previously stated, if these two other pictures have been rightly taken and placed in the stereoscope, it matters not whether the subject be atmospheric effects or aereal grandeur, mountain or foreground, *with all on one plane*; this plane, so far as focus is concerned, has nothing whatever to do with the distance-giving power.

It is the varying convergence of the axis of the two eyes that enables us to estimate distance in natural objects, and, when the stereoscopic slides and stereoscopes are made and used correctly, it is possible to appreciate the relief, distance, and perspective due to nature a thousand times better than from any single picture.

W. I. CHADWICK.

OUT-DOOR PHOTOGRAPHY.

II.—CHOICE OF APPARATUS.

THE selection of apparatus is by no means an easy matter for the inexperienced, or, in fact, for any one. There is so much on the market having a plausible look that its very abundance creates the difficulty. If it were only required for "wrapping in lavender," or to put under a glass case, the task would be easy, as perfection of polish and general appearance will suffice, the flimsiness and faddiness of design, with appurtenances for enabling everything to be done except the taking of a decent picture, being, under those circumstances, of little consequence. During the period of the camera craze the descriptive woodcuts of some of these elegant articles called cameras put one more in mind of the vagaries of a circus horse than anything else, being represented as in use while rearing, bucking, front or back downwards, and so forth, and while contorted into a variety of other shapes to show how supple they were, the light conical bellows being as if made of sheet steel, so well it appeared to accommodate itself to each position. Sagging of bellows and loss of parallelism through wear and dropping of parts are, of course, quite unknown in creations of this kind, and mention is not made of the splendid refinements in distortion they will produce if used for interiors with wide-angle lenses unless controlled by a complete battery of levels and plummets. What a nice illustration their use out of

doors in damp weather would make with the bellows tied for support to light girders of firewood with odds and ends of string; and how delightfully another could be made to show the delicate appreciation of the difference in the weight of lenses possessed by their rigid and extending fronts. The requirements of the professional go a little beyond this; he does not need show, and has no time to play with a mere box of tricks. His apparatus must be of a kind to inspire confidence, and relieve the mind from all anxiety respecting its performance; constructed substantially, and of such a design as to do the main things well in hot or cold, wet or fine weather, and capable of standing hard usage without getting out of truth or falling to pieces. There is no necessity for such an instrument to be either clumsy or heavy.

The main features of the most useful pattern of camera for all-round work are square body with reversible back, double extension backward, rising and falling front of good range, lateral front ditto, double swing back, and double dark slides, whose shutters fold round flat. In large cameras the double extension is better when formed of two distinct lengths of bellows joined to a centre frame; the forward one may be conical, the latter always parallel. The support thus afforded at the junction of the two keeps the bellows in better condition, the extra stability being well worth the few ounces extra weight. Cameras under 12 × 10 in size do not need it. Their bellows may be constructed partly conical, the parallel half, where it is joined to the back framing, being small in fold, to ensure perfect clearance with lenses of any description. The weak point of double extension is the sliding base frame. Whether this extends forward or behind, it must be unexceptionably well fitted, and its racking out limited in general use to about two-thirds or so of its length. Its chief defects arise from weakness in being made too slight and bad fitting, either initial or resulting from wear of the sliding tongues and grooves, all of which tend to cause the lens to pitch forward. The evil is likely to pass unnoticed on front extensions; or, if detected, is difficult of correction; whereas, when the lens-board is a fixture to the main base-board of the camera, and the back frame operated by the extending one, any want of truth is made right in the usual routine of setting the swing-back. Bear this in mind, and avoid mere triumphs of the cabinet-maker's art in favour of the more matter-of-fact-looking instruments, to which the right principle of extension from behind has been applied.

The rise and fall of the front, and the play of the lateral one, should be as extensive as possible, consistent with light-tightness. Most patterns of cameras have insufficient rise, not because space is limited, so much as, apparently, a desire on the part of the manufacturer to spare the brass a longer slotted plate would need. He ought to have the privilege of seeing one of his masterpieces with the milled-headed screw out, a penknife stuck in the face of the camera to hold the front higher, as if for the sole purpose of exhibiting to the select company the choice timber and workmanship of the under frame, and how economical his people had been in the blacking up. The defect, although a trifling one, causes much vexation, for it has to be dealt with just at the time when any disturbing influence is better absent.

With respect to the swings of the back, both should move on pivots at their respective centres in the old-fashioned way, the distance and position of the focussing screen in respect of the axis of the lens thereby remaining constant, and, being uncomplicated by other disturbing elements, which swing fronts, hinged sides and bottoms, and so forth, introduce, their benefits are realised with less expenditure of time and trouble. See that there are no loose fixings, and that all may be securely bound in any position within their range into one rigid piece.

If the instrument be ordered or purchased direct from a manufacturer, instruct him to have all grooves and tongues, both of camera and slides, well embodied with polish and papered off. These are just the places most in need of varnish to prevent swelling and sticking of shutters and sliding frames; but, as the labour and polish has no decorative result when applied to them, they are usually left untouched, to become an intolerable nuisance after being a few hours out in damp weather. Before putting it into general use, ascertain whether it is light-proof, and see that its dark slides are all likewise safe and in accurate register with the ground surface of the focussing screen. Failing to register was a common fault. In the course of my experience I have known first-class lenses to be condemned as worthless, and have on many occasions pointed the evil out to brother photographers, who were at their wits' end to know what was amiss, and, on one very important occasion, affording a chance which has never been repeated, I was badly sold myself. A new camera had been purchased for the event, and one slide only tested. This happened to be right, just enough to make a fool's paradise, with the usual result. The introduction of machinery, and the more free use of templets in the manufacture of the modern camera, together with the shelving of lenses of the "baby" lens type, has mitigated, but not quite cured, the evil.

Among the minor points give the preference to rack work, as the wear of the grooves is less, and the motion truer than with a winch screw; have no loose screws or parts, and see that the interior of the camera is well covered with a coating of deep matt black.

A large focussing cloth, specially made for use with the camera, should be provided, with one of its small sides sewn with a hem to three sides of a moderate size square of the same material, in which a large circular hole has been cut at the centre, and also hemmed. Into both hems a piece of elastic webbing of suitable length is run and fastened. This forms a kind of hood or bag to completely envelop the front of the camera, the remainder of the cloth passing backwards to cover the tail-board in the usual way. A thing of this kind never gets blown away, it effectually shelters the camera, and offers no obstacle to the rapid manipulation of the camera fronts, whose screws are released or tightened through the central aperture surrounding the lens. I prefer a double thickness of fine "silesia" sewn together round the edges, and a few times across to keep it neat and shapely. A second one of the usual form is needed for use with the dark slides.

Of tripods two are necessary, one being of the ordinary pattern, in which each leg consists of two pieces of stuff, jointed near the foot, or in one piece ripped two-thirds of the way down. This type is very steady, and is easily set up. Avoid all "gimcracks" with a dozen joints and spider-like limbs; leave these to the professors of the "fuzzytype" school, who probably may find the art qualities of their productions much enhanced by the employment of these unsteady articles. The second should be of a sliding pattern about five feet or so high, the extension of the legs giving another four feet six or so, and have a ball-and-socket head of good design. I have seen and used several, both ancient and modern, nearly all the latter failing in one respect, in that the binding of the screw, through being direct on the ball, soon wears this so much that accurate adjustment is almost an impossibility. The first pair of tripods I ever set up when I entered the ranks, seven or eight-and-twenty years ago, were two of the old French ball-and-socket pattern. The design of these was about right. Instead of the ball being bound as above, it was slightly scored, and rested in a semi-globular cavity on the upper side of the wooden head of the tripod, a second hollow piece having a central hole for the stalk of the ball to pass through, confined it from above, and was drawn with force upon it by means of three bolts, which, after passing through the head of the tripod, were secured in a brass frame, whose centre was tapped for a thumb-screw to bear on the under-side of the tripod head. By these means the ball was pinched with great force in any position without slip or disturbance of any kind.

JOHN HARMER.

Our Editorial Table.

MR. GEO. PENDRY, of Nottingham, has submitted to us some specimens of photo-ceramic work on china, which, both as examples of the capabilities of the process and as photographs, we are pleased to pronounce excellent. They are highly glazed, which, if anything, enhances the beauty of the pictures. Mr. Pendry, we believe, makes a speciality of ceramic work for the trade. Certainly the examples before us in softness and finish rival any we have seen.

VERNON HEATH'S RECOLLECTIONS.

London: Cassell & Co., Limited.

THE "recollections" of a veteran photographer, like Vernon Heath, will necessarily be perused with interest by photographers of all classes, for his fine appreciation of art in connexion with photography, and the surpassing excellence of many of his pictures have, doubtless, conduced to hasten the time when something else than mere technical skill is held to be requisite. The first part of the work relates largely to Robert Vernon, who, in 1847, presented his collection of pictures to the National Gallery; the remaining part is relegated to the author's connexion with photography which, at the death of his uncle, he adopted as a profession. He, in this capacity, took the last photograph that was obtained of H.R.H. the Prince Consort, and *apropos* of which he read a paper, on the reproduction of negatives, at a meeting of the Photographic Society of London, in 1862, which he claims was the first public announcement of enlarging from negatives by the use of a transparency. There is, perhaps necessarily, much of the

personal element running through Mr. Heath's work, which, as we have said, will prove of interest to photographers, especially to those who wish to know what took place in former times.

Fallowfield's New Celloidin Silver Emulsion Paper.

A sample of this paper received from Mr. Jonathan Fallowfield having been carefully tried we find that it is highly sensitive and yields good tones. When taken from the printing frame, following the directions given, it was transferred directly to the toning and fixing bath, the composition of which is as follows:—

Distilled water	20 ounces.
Hyposulphite soda	4 „
Ammon. sulphocyanide	½ „
Acetate of lead	1 drachm.
Nitrate of lead	1 „
Powdered alum	1 „
Citric acid	1 „
Chloride of gold solution (1 grain in 1 drachm)	4 drachms.

In this it acquired a dark purple tone, and also became fixed. This paper will, we doubt not, take its place among the favourite brands now on the market.

Photo-engraving.

By Carl Schraubstadter, Jun., St. Louis, U.S.A.

This is undoubtedly a most useful and practical work by one who appears to have an intimate acquaintance with photo-engraving in all its branches. The author treats the subject in the most thorough manner from the fitting up of the atelier, the method of preparing and intensifying negatives suitable for the work, the selection, polishing sensitising, printing, and etching of the plates, up to the mounting on the blocks so as to be ready for printing. The work is comprehensive, and is not confined to one system alone but embraces all that are now practised from line to half-tone subjects.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 5597.—"Improvements in the Art of Producing Coloured Photographs." Complete specification. J. W. McIlhenney.—*Dated March* 22, 1892.

No. 5672.—"A Studio Camera Stand." W. J. Boughton.—*Dated March* 23, 1892.

No. 5706.—"Improvements in or connected with Photographic Cameras." J. R. Gotz.—*Dated March* 23, 1892.

No. 5742.—"Improvements in Photographic Shutters." A. S. Newman and J. Guardia.—*Dated March* 23, 1892.

No. 5744.—"Improvements in Photographic Cameras." W. Palmer.—*Dated March* 23, 1892.

No. 5753.—"Improved Apparatus for Testing the Sensitiveness of Photographic Surfaces." J. W. T. Cadett.—*Dated March* 24, 1892.

No. 5756.—"Improvements in or relating to the Dark Slides of Photographic Cameras." A. H. Kirby.—*Dated March* 24, 1892.

No. 5853.—"The Magazine Repeating Photographic Dark Slide or Plate Changer." F. Near.—*Dated March* 2, 1892.

No. 5854.—"Improvements in Flanges and Fittings for the Same for Application to Cameras and Lanterns." A. E. Hench.—*Dated March* 25, 1892.

No. 5892.—"Improvements in Means for Obtaining Photographic Images." Communicated by A. and L. Lumière. C. K. Mills.—*Dated March* 25, 1892.

PATENTS COMPLETED.

Improvements in and Relating to Masks and Binders, and Apparatus for Mounting Same on the Glasses of Magic Lantern Slides, Photographs, Stereoscopic Slides, and the Like.

No. 3823. David Alexander Abercrombie, 34, St. Andrew-square, and Alexander Robertson Fletcher, 21, Queen's-crescent, both in the City and County of Edinburgh.—*February* 20, 1892.

This invention has reference to and comprises a combined mask and binder, and means of, or apparatus for, mounting or attaching same to the glasses of magic lantern slides, photographs, stereoscopic slides, and the like, for protecting and binding them airtight; and which will be more simple and efficient than what has been heretofore in use.

The improvements consist first in making a mask and binder combined in one of gummed paper or cloth, or equivalent material. This is effected by cutting the paper or cloth of a suitable size to bind round the edges and over the back of the glasses, plain on the outer surface, and gummed or cemented on the inner surface, with a large circular or other opening in the centre. The binding edges would be cut away at an angle of forty-five degrees or so at the corners at that part of the mask which is to fold over and meet each other on the back of the glasses, leaving a square tongue part at the centre of each corner, equal to the thickness of the glasses, attached by one of its sides to the two opposite folding edges of the mask, so as to overlap and cover the corners of the glass which it binds, before the other two opposite edges of the mask are folded over. These combined masks and binders, cut and formed in the improved manner described, may be thus folded over and attached to the glass by hand, but would preferably be mounted by our new or improved slide mounter or apparatus. This consists under one arrangement of a square or rectangular open frame, preferably of wood, of the size of the glasses internally, with four lateral sliding sides or bars at its upper part, having an elastic band, or other binding springs surrounding them, and with a removable bottom or solid part working within the back part of frame to support the glasses. This solid back part would preferably consist of two square or rectangular pieces connected to each other at some distance apart by pins and sockets with springs, or with a helical, or other spring, between the two parts, so that the inner part will have a collapsing or yielding elastic action when the glass plate is pressed towards it as hereinafter described, while the outer bottom part would be held in a checked recess in the lower part of the frame by swivelling catches or otherwise. In using this apparatus the combined paper or cloth mask and binder so cut is moistened on its gummed upper side, and placed with its dry side within the upper part of frame made to the size of mask, over the edges of the four lateral sliding parts, which are dovetailed and meet each other at their inner corners, and on the upper surface of the spring bottom, which is brought up by the springs within and to the upper part of sliding sides, and the glasses are laid over the mask and spring bottom, or the mask may be gummed to the front glass before being inserted in frame. The glasses are then pressed inwards by hand, by which action the mask binder is carried along with them through between the spring-pressing sides, and bound round the edges of glass and depressed with inner part of spring bottom at back part of frame. The two opposite folding or sliding spring sides of frame, which fold up the edges of the mask, and to which the corner tongues of mask are attached, are highest, and come first into action to fold up these two edges, and fold in the four end tongues before the other two opposite sliding sides come into action, these being less in depth, and so fold up their edges over the tongues, which seal the ends airtight at the same time as sealing the four edges. The glasses and spring bottom are then pressed further down, until they pass the lower edge of the spring sliding sides, which now slide inwards over the upper glass and press down the edges of the mask to adhere on to the upper surface edges of the glasses, assisted by the action of the springs, these edges meeting each other in a mitre joint at the corners. In some cases the lower surface edges of these sliding bars might be fitted with vulcanised indiarubber or other soft material, to so fold and press the edges of the mask on to the glass. Each glass slide can then be removed by taking out the spring bottom of the frame, which is again inserted before mounting the next glass with a mask and binder.

To assist in placing or inserting the glass or glasses centrally over the moistened gummed mask in these frames, a loose portable frame, holding these, may be employed, fitting the mounting frame on pins or otherwise, and with turn latches or slides moved in unison, which would allow the glass to drop out of this upper movable frame down on to the centre of the mask in the fixed frame. Or, otherwise, corner guides may be mounted on hinges on the fixed frame, to be folded over after putting in the moistened mask, and so guide the glasses down on to the mask, and be folded out of the way again as soon as the glasses were placed in position.

This apparatus may also be used for folding and attaching the ordinary ornamental sheet metal outer securing or binding mounts over the glasses and masks.

Improvements in Photographic Apparatus.

No. 3942. John Naylor, The Laurels, Nightingale-road, Harlesden, Middlesex.—*February* 20, 1892.

The object of my invention is to improve the well-known roller slides in use in photographic apparatus, and particularly those known as the Eastman roller slide. In these slides, as now in use, the perforations for the purpose of indicating the point or points at which the film should be divided after each exposure are indefinite, that is to say, they do not actually indicate the exact line on which the film should be divided by crossing the same vertically, and there is danger of mistaking the points, by reason of there being four or more perforations at the top and bottom edges of each section of the film (*i.e.*, each exposure); moreover, there is no means of registering the number of exposures, or of indicating if the last exposure has been wound off.

Now, by my invention I perforate the film on each exposure vertically, or across the same in the line of division, and at the necessary point only. I further automatically register, by the winding of the film on the roller, the number of exposures made, and further indicate if the last film exposed has been wound off or not.

In carrying out my invention, I take an ordinary Eastman roller slide frame, and cut a slot in the measuring roller extending a little beyond the centre and the whole length of the roller, and at each end of the roller I attach a hollow metal cap, one of which terminates in a short hollow shoulder, forming a bearing engaging with the pin on which the roller usually revolves. To the other cap is fixed a small wheel, which gears with a second wheel, as in the Eastman apparatus. In the slot formed in the roller I fix a thin metal bar or strip, carrying points or teeth, which is caused to rise from the slot in the roller and perforate the film on each withdrawal or replacement of the shutter. The bar or strip is enclosed between two other thin strips of metal, forming a case and carrying inclined planes, up which the centre piece, carrying the points or pins, rides on being actuated.

The slide shutter carries, on the outer side, a catch engaging with a spring slide, which, pushed by the hand or finger, releases the shutter, and at the same time actuates a spindle attached to the strip or bar carrying the points which make the perforations.

To register the number of exposures, I fix on to the frame of the slide, and conveniently near to the end of the roller, a toothed wheel, indicating units, carrying a pin gearing into a smaller toothed wheel, indicating tens. On the spindle of the wheel already described as the second wheel I attach outside the frame a collar, having a projection, which engages with the teeth of the unit

registering wheel, so that after each exposure the unit registering wheel is turned one point. The collar has an indent, in which engages the tooth attached to a lever spring, which prevents overwinding, and produces an audible "click" when the exposed section of film has been wound off. This point or tooth on the lever spring is released from the indent in the collar by actuating the before-mentioned releasing catch on the shutter, and shows at a glance whether the film has been exposed and is ready for winding up or not.

The bearings of the two registering wheels are so arranged that they may be put in and out of gear with each other for the purpose of re-setting.

Improvements in Dark Slides for Photographic Purposes.

(A Communication by Paul Tournachon, of 58*bis*, Chaussée d'Antin, Paris, France.)

No. 6572. James Yate Johnson, 47, Lincolns-Inn-Fields, Middlesex.—*February* 20, 1892.

My invention relating to dark slides for photographic purposes consists in improvements in the construction and arrangement of the parts connected with the film carriers, and is partly applicable to other dark slides, as hereinafter explained.

The dark slides, according to my invention, enable a large number of exposures to be made upon the paper or film, which is of considerable length, and an indicator is employed to show the number of exposures.

The supports of the rollers slide into a light-tight case, closed in front by a shutter, which is removed during exposure, and inserted for the time into a groove or slot at the back.

When the shutter is removed, the opening through which it is withdrawn is instantly closed by a transverse slide, actuated by a spring and provided with an incline or bevel enabling it to be pressed back when the shutter is returned to its place.

This transverse slide also exerts upon the shutter sufficient pressure to ensure the effectual exclusion of light. These arrangements are applicable to dark slides of any construction.

The spool is composed of four segments, so put together as to present two longitudinal openings arranged at right angles, and turns on two fixed pivots. A disc at one end of the spool carries pins, which engage in holes in the end of the spool. The end of the film is inserted into one of the longitudinal openings, and is secured by a plate sliding in the other opening arranged at right angles with the first, so as to bend back the end of the film and retain it firmly in position.

The receiving roller is similarly constructed, and is capable of being rotated from the exterior by means of a hinged key or folding handle.

The movement of the film or paper is controlled by a pivoted brake spring with two arms, whose extremities engage with the toothed edges of discs connected with the spool and the receiving roller. A lever pressing the brake arm against a fixed stop compels the brake to exercise a constant or uniform pressure upon the roller discs. Owing to the shape of their teeth, these discs, and consequently the rollers with which they correspond, can only turn in one direction. The brake can be released by removing the pressure of the lever.

The said lever is retained in position by a spring catch, which, when released, enables the roller and spool to turn freely in either direction.

The perforating or registering roller is fluted, to prevent slipping of the paper or film, and is of such diameter that, when it has made exactly two revolutions, for example, sufficient of the film is unrolled for one exposure. Inside the registering roller is a roller of smaller diameter, rotating in bearings in the ends of the registering roller. The small roller is arranged eccentrically to the registering roller and a wheel on the axis of the eccentric roller gears with a pinion, having, for example, half as many teeth as the wheel on the axis of the registering roller.

A series of small blades or prickers, carried by the eccentric roller, project through openings in the side of the registering roller when the eccentric roller is in a certain position, and the relative diameters of the gearing is so calculated as to cause the said prickers to project once for every two revolutions, for example, of the registering roller, and cause the successive negatives to be separated from one another by a series of holes.

The film drawn from the spool passes over the perforating or registering roller, and is drawn in front of the slide where it is exposed. It then passes round a plain guide-roller, and is wound upon the receiving roller.

The number of exposures is indicated by the number of revolutions made by the registering roller. This number is recorded by two discs, one disc indicating units, and one indicating tens, for example. These discs are concentrically arranged, the disc for the tens accomplishing the tenth part of a revolution, while the unit disc makes a whole revolution. The figures are preferably formed on the flat sides of the discs in order to economise space and enable the counter to be contained in the thickness of the side of the case. A stud or pin on the end of the registering roller drives a star wheel intermittently, causing it to advance one a tooth at each revolution of the roller, and this movement is transmitted to the indicating or registering mechanism by suitable gearing.

The tens disc rotating concentrically with the unit disc is provided with ten equidistant holes, which successively coincide with a hole in the unit disc situated on the radius corresponding to zero. A spring pin enters this hole so as to lock the disc together.

A metal plate, covering the indicator mechanism, is provided with an orifice showing the figures, and also enabling the inclined extremity of spring of the locking pin to move forwards each time that the zero is presented at the orifice. This movement locks the unit disc and tens disc together once at every revolution of the unit disc, and displaces the tens disc to the extent of one figure, after which the inclined end of the locking spring comes in contact with the edge of the orifice in the covering plate, and releases the said tens disc, which then remains stationary until the unit disc has completed another revolution.

Each time the indicator advances a unit, the end of a spring falls from one tooth to another of a ratchet wheel, causing a clicking sound, indicating that the roller has been sufficiently rotated. This device also renders it impossible to turn the roller and counter the wrong way.

The ratchet wheel may be arranged to actuate a bell or other sounding device.

A tension roller is carried by two springs, which cause it to press regularly on the paper or film.

The plates carrying the journals of the rollers are connected and stayed by suitable rods, and the plates at the sides are cut away and recessed to facilitate the working and the insertion of the film.

Hinged flaps are provided at the sides of the slide to prevent the film getting torn at the edges when sliding the plates carrying the rollers into the outer case of the slide.

To obviate the waste of paper or film, in roller slides arranged as herein described or otherwise, and which is involved by the ordinary methods of attaching the ends of the films to the rollers, I attach to the end of the film a linen band of the same width as the film, and to this linen band is attached a spring clip, one of the jaws of which is provided with a slot or opening. The film is drawn between the jaws and the end inserted into this slot, and secured by sliding a rectangular binder or wire over the projecting end of the film. This linen band is then attached to the roller, and replaces that portion of the film, which would otherwise be wasted.

The dark roller slides, according to my invention, may be attached to the camera by the usual sliding motion or in any other suitable manner.

Improvements in Photographic Printing Processes.

No. 7312. William Walker James Nicol, Mason College, Birmingham.—*February* 27, 1892.

My invention has for its object the production of photographic pictures or images in silver by improved methods of carrying into effect the processes described in the specification of my former Letters Patent, No. 5374, dated March 29, 1889.

Whereas the processes therein described and set forth, though yielding excellent results so far as the quality and tone of the resulting pictures were concerned, were apt, inasmuch as the solutions employed for development contained soluble salts of silver, to stain the hands of the operator, it was found that this formed a serious objection to their general employment.

I therefore now proceed acording to the following method—that is to say, I coat, in any convenient way, paper or other material with an aqueous or other solution of a ferric salt. This may be one or other of the following: ferric oxalate, citrate, tartrate, or other ferric salt which is sensitive to light. These may be employed singly, or mixed together in suitable proportions, with or without the addition of citric, tartaric, oxalic acids, or their sodium, potassium, or ammonium salts. To the above solution is also added a suitable quantity of a silver salt, and the whole is thoroughly mixed together. The above solutions may be applied to the paper or other material, if so desired, separately, and in any order, and in such relative quantities as may be found to give results most suitable for the purpose in view.

After the material, thus prepared and rendered sensitive to light, has been dried, it is exposed to light under a negative or other screen. I then proceed to develop the ferrous image produced by the action of light with a solution containing a salt of citric, tartaric, oxalic, boric, carbonic, or acetic acid, with sodium potassium or ammonium; or mixtures of these with one another in such proportions as may be found to give the requisite tone and brilliancy to the resulting images. When certain of these mixtures are employed, the addition of a small quantity of potassium chromate, or other suitable oxidising agent, is necessary to ensure contrast and purity of the high lights of the picture.

The resulting prints are then washed in several changes of dilute ammonia, to which may have been added a citrate or tartrate of potassium sodium or ammonium.

Or, I adopt the following method. The paper or other material, having been prepared as above described, is exposed to light as before, and is developed at once on the dilute ammonia mentioned above, with or without the addition of one or other of the salts mentioned as entering into the composition of the developer as described above.

Or, I adopt the following method, viz.:—I prepare the paper or other material with one of the above ferric salts, and a suitable amount of one of the above-mentioned developing salts, and a solution of a silver salt. I thus obtain a sensitive surface which attains its full depth of tone by the action of light alone. The print then requires only to be washed in the dilute ammonia above mentioned.

I. In practising my invention, according to the first method above described, I use by preference solutions of the following composition:—

Water, one hundred (100) cubic centimetres.
Ferric oxalate, fifteen (15) grammes.
Silver nitrate, three (3) grammes.

The above forms the sensitising solution.

The developer is as follows:—

Water, one hundred (100) cubic centimetres.
Rochelle salt, ten (10) grammes.
Borax, seven (7) grammes.

To this is added one-tenth (0·1) to four-tenths (0·4) of a cubic centimetre of a five (5) per cent. solution of potassium chromate.

The prints are immersed in the above solution for fifteen to thirty minutes, and are then washed in two changes of the following:—

Water, one (1) litre.
Ammonia (specific gravity = 0·880), three (3) cubic centimetres.

The prints are then washed in water and dried.

II. According to the second method above described, I use the following solutions:—

Sensitising Solution.

Water one hundred (100) cubic centimetres.
Ferric citrate ten (10) grammes.
Oxalic acid three (3) grammes.
Silver nitrate three (3) grammes.

After exposure to light the prints are immersed in

Water one (1) litre.
Ammonia (spec. grav. = 0·880) six (6) cubic centimetres.
Sodium citrate twenty (20) grammes.

They are then washed in the dilute ammonia described in the first method.

III. According to the third method above described, I use the following solutions :—

SENSITISING SOLUTION.

Water, one hundred (100) cubic centimetres.
Ferric oxalate, fifteen (15) grammes.
Potassium oxalate, three (3) grammes.
Silver nitrate, three (3) grammes.

After exposure to light, the prints which should have attained their full depth are washed in the following :—

Water, one hundred (100) cubic centimetres.
Sodium citrate, three (3) grammes.
Citric acid five-tenths (0·5) of a gramme.

They are then washed in the dilute ammonia and in water, and dried.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I wish it to be understood that I do not limit myself to the proportions above stated, but alter them in various ways with the tone or colour required in the finished picture, and I claim :—1. The use of paper or other surfaces prepared with mixtures of ferric and silver salts as described above, to be used for the production of photographic images in silver along with the class of developing solutions already given and particularly referred to in my second claim. 2. The use of developers as described in the above first and second methods in conjunction with paper prepared with ferric salts as above described. 3. The use of the sensitising, developing, and washing solutions particularly stated above, and there set forth.

IMPROVEMENTS IN PHOTOGRAPHIC CAMERAS AND APPARATUS CONNECTED THEREWITH.

No. 3603. ALEXANDER MILLER, Hollyhurst, Clapham Common, London.—*February* 27, 1892.

MY invention is of two parts.

I. The application of a swing back to hand and other cameras in combination with, and attached to, a horizontal swing focussing screen on the top of the camera.

II. The use of a mirror, fixed to or near the lens, and capable of being placed at an angle in front of it, so that objects at either side of the camera or above it can be photographed without its being pointed directly towards them.

1. To carry out the first part of my invention, I make—

(A) The back of the camera with a vertical swing movement, and connect it by a system of levers, or otherwise, with a horizontal swing focussing screen on the top of the camera, in such a way that the back and the screen always preserve their relative positions at right angles to each other when the back is tilted.

Or (B) I effect the same object by making inside the back of the camera a case to contain plates or roll-holder, this case being made to swing vertically and being connected with the horizontal screen in the same way as described above.

I apply either of the foregoing arrangements preferably to the type of hand camera in which the image from the principal lens is, for focussing purposes, reflected from a mirror inside the camera to a screen at the top; but I propose to apply it also to those which have a small separate focussing screen and "finder" lens. In either case I am able to tilt the camera, to see on the screen the amount of distortion thereby caused, and to correct it by the swing back, as in an ordinary camera.

2. To carry out the second part of my invention, I fix a mirror to, or near, the lens of any camera, so hinged or pivoted that it can be placed at an angle in front of the lens, and thereby objects at the side of, or above, the camera are reflected into it without pointing it directly towards them. In hand cameras, I place the mirror preferably in a front chamber enclosing the lens, with an opening at each side of this chamber to allow light from objects at the side to fall upon the mirror, which can be placed on either side of the lens.

Having described my invention, I now state what I claim as novel, viz., 1. The use in hand cameras of a vertical swing back or case, in combination with, and attached to, a horizontal swing focussing screen, substantially as described above. 2. The use, in connexion with all cameras, of a mirror placed at an angle in front of the lens for the purpose of photographing objects at the side of, or above, the camera.

AN IMPROVED PHOTOGRAPHIC CAMERA.

No. 1730. AUGUSTE ALEXANDRE DEHORA, 8, Rue des Hautefeuilles, Paris, France.—*March* 5, 1892.

THIS invention relates to an improved spring folding photographic camera, capable of being collapsed within such small dimensions as to admit of its being carried in the pocket. It may be provided with any suitable lens and shutter and is used at a fixed focus.

The camera is constructed in the manner of a "Gibus" hat, the front and back being connected together by means of toggle-jointed links, to which springs are attached so as to retain the toggle joints either in the folded position or in the expanded position. A black cloth covering encloses the springs, and forms the collapsible part of the camera body which is distended by the toggle joints, there being a cloth covering within and without the said joints.

It is preferred to use spiral springs, although other forms of spring may be used, and the form of the camera may be varied from that shown.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
April 4	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 4	Halifax Camera Club	
,, 4	Peterborough	Museum, Minster Precincts.
,, 4	South London (Annual)	Hanover Hall, Hanover-park, S.E.
,, 4	Stereoscopic Club	Brooklands Hotel, Brooklands.
,, 5	Exeter	College Hall, South-street, Exeter.
,, 5	Glossop Dale	Rooms, Howard-chambers, Glossop.
,, 5	Herefordshire	Mansion House, Hereford.
,, 5	Lewes	Fitzroy Library, High-st., Lewes.
,, 6	North London	Wellington Hall, Islington, N.
,, 5	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 5	Rotherham	
,, 5	Sheffield Photo. Society	Masonic Hall, Surrey-street.
,, 5	York	Victoria Hall, York.
,, 6	Edinburgh Photo. Society	Professional Hall, 20, George-street.
,, 6	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 6	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 6	Southsea	
,, 6	Wallasey	Egremont Institute, Egremont.
,, 6	West Surrey	St. Mark's Schools, Battersea-rise.
,, 7	Bolton Photo. Society	Baths, Bridgman-street.
,, 7	Brixton and Clapham	Gresham Hall, Brixton.
,, 7	Camera Club	Charing-cross-road, W.C.
,, 7	Dundee and East of Scotland	Lamb's Hotel, Dundee.
,, 7	Glasgow Photo. Association	Philoso. Soc. Rooms, 207, Bath-st.
,, 7	Leeds Photo. Society	Mechanics' Institute, Leeds.
,, 7	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 7	Oldham	The Lyceum, Union-st., Oldham.
,, 7	Tunbridge Wells	Mechanics' Inst., Tunbridge Wells.
,, 8	Cardiff	
,, 8	Holborn	
,, 8	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 8	Maidstone	"The Palace," Maidstone.
,, 8	Richmond	Greyhound Hotel, Richmond.
,, 8	West London	Chiswick School of Art, Chiswick.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 24.—Mr. L. Warnerke in the chair.

Messrs. W. Cobb, H. Rapson, and E. A. Golledge were elected members of the Association.

The following question from the box was read,—"What would be the length of focus and value of the stops if the back combination only of an eleven-inch rapid rectilinear or eight and a half inch wide-angle lens were used? What would be the disadvantages, and would there be any pronounced distortion?"

Mr. W. E. DEBENHAM replied that, if the lenses were symmetrical, the length of focus would be about double. The value of the stops would be divided by four, that is, each stop would require four times the usual exposure given. There would be curvature of the lines if architectural subjects were taken to the full field.

Another question ran: "What is the difference between chemical and physical restrainers?" which elicited no reply, as the questioner's meaning was not clear.

A third question asked: "What alteration took place in the composition of the ferrous oxalate developer after development of the plate?" and to this it was replied that a portion of the developer was converted into ferric oxalate.

Mr. W. H. HARRISON read a paper on *Foreign Photographic Institutions and their Influence* [see p. 213]. At its conclusion,

Mr. F. A. BRIDGE referred to the excellent collotype work of M. Maes, of Brussels. On a recent visit there he (Mr. Bridge) had seen reproductions of various makes of lace and of old gateways and citadels in Belgium, made by M. Maes, which were very fine indeed. M. Maes would gladly give members of the Association any information.

Mr. A. TATE said that at Lausanne he had been much impressed with the facilities which existed there for obtaining information on the principal photographic subjects. He also said that in Norway and Sweden, in the ordinary course of compulsory education, every student had the opportunity of learning at least three living languages, which there was no doubt in the battle of life would be of the greatest possible advantage to him.

Mr. DEBENHAM said that he would like to see education carried out as much as possible, but in the battle of life they often found English people without much education had the faculty—the business faculty—of getting on. He admired education on scientific matters, and wished to forward it, but thought it rather independent of success in the battle of life.

The CHAIRMAN said that in the last number of Nadar's *Paris Photographie* he was surprised to find an account of a photographic educational establishment, in which the great necessity of photo-technical education was insisted on. Quite recently in France photo-mechanical printers were in great request, but could not be got, and the work had to be given to Germans. In this respect England was unfortunate, and it indicated clearly the need of photographic technical education, which the French Government were just providing.

Mr. P. EVERETT said he should no doubt be called a heretic; but he, for one, did not deplore the fact that we had to send to Germany when we wanted a good collotype-process man. This raised the whole question of foreign trade, which was lost sight of in this matter of technical education. Was it desirable to set up photo-mechanical printing on the footing on which it existed? Was it a desirable industry, and did the workmen abroad get better wages than the average printer in this country? They were less paid than they would be here. Those who deplored that this country could not undertake such work forgot that by far the best thing was for it to produce those articles which were within its own environment, and so leave production to the ordinary course of trade.

The CHAIRMAN referred to the disastrous effects upon photo-mechanical.

houses in this country of foreign workmen engaging with them, and then being tempted elsewhere by offers of higher wages. Photo-mechanical illustrations for books were just now very popular, but they very often had to go abroad for them. England was a large publishing country, but it went in a great deal for the cheap and nasty. Look at the paper on which many of its publications were printed! In London they could not get paper suitable for printing photo-mechanical work; there was some secret in imparting a smooth surface to it. At the Conference of the Camera Club on the previous day Mr. Pennell had referred to the bad paper employed as not printing illustrations well.

Mr. T. Bolas said that Mr. Everett's contentions were not in any sense arguments against technical education. The spread of technical education enabled each nation to take advantage of its environments.

Mr. Harrison having replied to some questions put to him, the Chairman's slides, illustrating his recently delivered paper on *Photo-technical Education on the Continent*, were exhibited, at the conclusion of which, and in the course of further remarks, he took exception to Captain Abney's recent plea for a modest Photographic Institute, with modest professors, &c., asking whether it was worth while to start on a small scale! An English establishment should not be inferior to those he had described that night. As an example of what foreign countries could do in the matter of exhibitions, the Moscow Photographic exhibition, just opened, had twenty rooms devoted to exhibits, two being set apart for a scientific section. There was also to be seen there the first attempt made to photograph the retina of a murdered woman. The exhibitions in Vienna and Belgium were also very fine, and here, in London, the Photographic Society of Great Britain held its exhibition in one room only.

Votes of thanks to Mr. Harrison and Mr. Warnerke terminated the proceedings.

North Middlesex Photographic Society.—March 28, Mr. F. Gaudon in the chair. Mr. C. Beadle delivered a lecture on *Enlarging by Artificial Light with the Use of a Lantern*. Having dealt with all the factors to be considered, the lecturer explained his apparatus, and made a 15½×12 print from a half-plate by means of it. The apparatus consisted of a lightly made box, three feet long, having a light-tight door at each end and a light-tight lid. A movable platform fitted inside the box, and rested on the bottom. Upon one end of this a camera, bearing a six-inch lens, was attached by the tripod screw. At the other end was a frame glazed with clear glass, having behind and in contact a sheet of ground glass. This frame moved backwards and forwards on runners. The negative was fitted in a rabbet in the doorway at the end of the box to which the camera was fitted. The lens and focussing screen were placed roughly in position, according to the distances given in enlarging tables. Exact focus was obtained by looking through the door behind the focussing screen, and moving the lens and screen to their proper position. These points were marked upon the platform for future use. A sheet of Eastman's "rapid" bromide paper was then, by non-actinic light, placed in the frame face to the clear glass, and kept flat by the ground glass placed at the back of it. The frame or slide being slipped back into position, the box was closed with the exception of the door in front of the negative. Exposure was made by magnesium ribbon, burned at one inch from the negative, care being taken to secure even illumination by moving the ribbon from point to point. As the negative was rather dense, and stop 16-*f* used, six feet of ribbon were required. Mr. Beadle used ferrous oxalate, strongly restrained, and applied a normal developer by means of a tuft of cotton wool to bring up lagging detail where necessary. The print proved an excellent one. Contact prints were then made on Eastman "rapid" and "permanent" paper for the benefit of the younger members who had not previously worked the process. Mr. Beadle stated that he commonly used the apparatus for daylight enlarging. He fitted the bromide paper or sensitive plate in the dark room, carried the box into the garden, and, standing it on end, made the exposure by opening the door and exposing the negative to the sky. A lecture on the *Detection of Crime by Photography*, by Dr. Jeserich, was, by the kindness of the Photographic Society of Great Britain, brought before the Society as one of the affiliated societies. The lecture was thoroughly wrought out, and of absorbing interest. Next meeting will be held on April 11, when Mr. J. Gale will give an address, illustrated by lantern slides. Visitors will be welcome.

Kensington and Bayswater Photographic Society.—March 28, Mr. Leslie Selby presiding.—An exhibition of lantern slides, principally from photographs by members and their friends, took place. The collection consisted of river and wood scenery, copies from woodcuts and engravings, portraits and interiors, and several photographs of microscopic slides, among which were a very fine group of diatoms, parts of insects, &c. The exhibition of the different tones capable of being produced by varying the exposure and development gained considerable attention. Next meeting, April 11, when Mr. J. D. England will give a paper on *Celluloid Films*.

West London Photographic Society.—March 25, the President in the chair.—Mr. Whiting read a paper bearing on the art side of photography, rules of composition, principles of selection, &c., illustrated by a number of lantern slides, which showed that Mr. Whiting, unlike some photographers, carries into practice the theory he preaches, and evidently with success. He exhibited an ingenious view meter of his own construction, capable of being used with different lenses. The annual dinner will take place on May 13.

Putney Photographic Society.—March 26, Rev. L. Macdona in the chair.—A practical paper on *Printing Processes*, the sixth of the series, was read by Mr. J. A. Hodges, who described the principal features of the various printing methods—silver, bromide, platinum, &c. The preparation of home-sensitised paper was fully dealt with. After some discussion, a number of fine slides, illustrating a tour in North Devon, were shown, the lecturer's graphic and amusing description being highly appreciated. Next meeting, April 13, *Mounting*, by Mr. A. Horsley Hinton.

Richmond Camera Club.—March 25, Mr. Davis presided.—The Secretary read the translation of Dr. Jeserich's paper on *Photography Applied to the Detection of Crime*, lent by the Photographic Society of Great Britain, which, with its accompanying lantern illustrations, proved of the greatest possible interest, as showing how photography—and especially photo-micrography—has been made by the learned Doctor to supply irrefutable evidence where no other means would avail of the identity of criminals, the falsification of documents, and other indispensable links in the chain to drag the malefactor to justice; how, too, it has been the direct means of clearing wrongly suspected parties, and what a vast field of usefulness in the direction indicated the science is destined to fill.

South London Photographic Society.—March 21, exhibition of lantern slides by members, which were freely criticised. The criticism will no doubt prove very beneficial to the members in their work during the present season. The chief exhibitors were Messrs. Bailey, Dishman, Ester, Fellows, Farmer, and Oakden.

Blackheath Camera Club.—March 8, Mr. W. Farrington (Curator) in the chair.—Mr. E. J. Wall lectured on *Colour Photography*, and exhibited prints in illustration of various processes from the first discoveries of Collen to the latest development of the present time. In the course of his remarks the lecturer said, Collen, in 1865, first contended for making plates sensitive to the primary colours, from which subsequent good results have been obtained. To give some idea of the process, take three colour-sensitive plates, and expose them on the same object behind red, yellow, and blue-coloured screens, each of which cuts out respectively the other rays of colour not required to act. Collotype plates are then made, and inked up in corresponding colours, the superimposed printing effect of which gave a very good result. Respecting the chemicals used for preparing colour screens, soluble Prussian blue will cut out the red and yellow rays, and allow the blue to act. Helianthin cuts out the red and blue for the yellow and green to act, and bichromate of potash cuts out the blue and yellow to let the red act. Vogel, who discovered the optical sensitisers, goes still further, and proposes to make seven negatives sensitive to the colours of the spectrum, to be printed in the same way. Ives's *modus operandi* to show natural colours is by use of the lantern, fitted with three lenses, and screens so arranged as to superimpose the pictures when displayed on the sheet, while Scott works in a similar way with four lenses. Albert, of Munich, has made some advances in this branch, but his process of working is a comparative secret. At the close of the paper some new lenses and work done by the same were shown, and a novelty in celluloid lantern slides and a carrier, concluding with a few new formulæ for developing gelatino-chloride prints.

West Kent Amateur Photographic Society.—March 25, Mr. A. R. Dresser in the chair.—Mr. Reffell gave a demonstration with an electric light (arc lamp) applied to the lantern slides by Messrs. Foy, Grant, Dresser, Reffell, Taylor, and Court were shown. Several photographs were taken by the same light, and good results obtained.

Birmingham Photographic Society.—March 23, last lantern evening of session.—A very fine selection of slides was passed through the lantern by Mr. E. Howard Jaques before a numerous audience. The first slides shown were a series loaned from the Camera Club, London, and comprised some splendid animal studies by Mr. Gambier Bolton, and various slides by Major Knot and Messrs. Stroh, Conway, Maskell, Green, &c., and Mr. Dresser's celebrated climbing dog studies. Mr. W. J. Harrison, F.G.S., who presided, announced that nearly 500 photographs had been sent in for the Society's annual competition and exhibition, which is to be held on April 5, 6, and 7.

Oxford Photographic Society.—March 24.—Mr. P. Lange lectured on Norway, in aid of the Radcliffe Infirmary. Mr. Lange soon made the audience feel that the encomiums placed to his credit in advance were thoroughly deserved. The wildest mountain and river scenery and some charming, quaint views of Norwegian towns and villages were placed in rapid succession upon the enormous screen. The choicest bits of all were some gorgeous cloud effects, sunrise, sunset, midnight sun, and moonlight, showing possibilities of development which very few professional photographers have yet realised.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

COLOURED LANTERN POSITIVES.

To the Editor.

Sir,—In your issue of March 4, you say that "M. Louis Ducos du Hauron writes to a French contemporary to point out that F. E. Ives' method of obtaining coloured lantern positives by superposition of different coloured pictures was anticipated by himself and M. Charles Cros so long ago as the year 1869. He therefore claims that it is a purely French invention, which has only been copied in America."

Has M. Louis Ducos du Hauron been asleep for the past ten years? Can it be that he has not learned that the method claimed by himself and Cros might, with very much better show of fairness, be credited to Henry Collen, of England, than my own method to himself or Cros? Composite heliochromy was neither invented nor carried to a successful issue in France, and the reproduction of such statements as the above is calculated only to deceive the public. The facts are clearly stated in my lecture on "Photography in the Colours of Nature," which was reprinted in your columns last year.

Vogel in Germany, Scott in England, and Bierstadt in America have also claimed the credit of my success, but they are all labouring under a delusion, or worse. The fact that we all use selective colour screens, and make three or more negatives of each object, does not make our processes the same, not even in the principle of colour selection, which, except in my own process, has always been absolutely inconsistent with the facts which support the modern theory of colour vision. In the interests of scientific progress among photographers, it is to be hoped that the persistent misrepresentation of facts in connexion with this subject may be discontinued.—I am, yours, &c., Fred. E. Ives

Philadelphia, March 15, 1892.

RATIO OF GRADATION.

To the EDITOR.

SIR,—I have been much interested by Messrs. Hurter & Driffield's reply to my letter of the 7th inst. in reference to the relations between the amount of silver and transparency in photographic negatives. I was certainly under the impression that the explanation of these relations, given in the first part of the paper on *Photo-chemical Investigations*, was intended as a mathematical demonstration of the truth of the views then put forward. Messrs. Hurter & Driffield, however, it appears, depend more on their experimental results than on the soundness of the reasoning there employed. That the formula $T = e^{-x}$ will not apply to every case in which light is obstructed by particles of appreciable size will, I think, be admitted, as it clearly fails in the instance I gave of a layer of only the thickness of one grain; and what we have to settle is, under what conditions does it cease to be trustworthy? In criticising my suggested formula, Messrs. Hurter & Driffield have understood a to mean the area covered by the reduced silver in each layer. It certainly always varies proportionately to that, but I used it to represent the amount of *light absorbed* by each layer in a unit of area. They consider that my reasoning necessarily assumes that the particles of silver are opaque, and would fail if it should prove that they only partially absorb the light falling on them, but I do not see that it would be affected if that were so. It is perfectly true, as they point out, that the particles in the second layer *might be so arranged* that $(1-a)$ of the light having passed the first layer, anything from $(1-a)$ to $(1-2a)$ might be the intensity passing through both; but we are dealing with very large numbers of grains of silver, scattered by *pure chance*, so that if we follow any one ray of light, whether through a clear part of the first layer or through a particle of silver, by which we will suppose its intensity is only partially reduced, then, in either case, its chance of striking a grain of silver in the second layer is precisely the same as it was in the first, so that we may reasonably conclude that the whole volume of light passing the first will be diminished by the second in just the same proportion as before; that is, it will then become reduced to $(1-a)^2$, and the same will be true till, after the nth, we shall have $(1-a)^n$ of the original light. Of course, as Messrs. Hurter & Driffield point out, the grains of silver in a photographic plate will not actually lie just in the n imaginary planes into which I have supposed the film divided; they will be more or less between one plane and the next; but, as this displacement can in no case amount to more than one-half of the diameter of a grain, so trifling a difference in position from that assumed in the reasoning could surely result in no appreciable error. In their explanation of the method by which their formula is arrived at, Messrs. Hurter & Driffield have to disregard differences from the theoretical position, sometimes amounting to many times the whole thickness of the film.

So far as these matters can be settled by reasoning, I think my views have some advantages over Messrs. Hurter & Driffield's; but the object of my letter was rather to show that there were apparently too many doubtful features about a photographic plate to allow of any really trustworthy result being so obtained, and I now gather from Messrs. Hurter & Driffield's article that they are nearly of the same opinion. It is claimed that experiments have shown, although the truth of it cannot be mathematically demonstrated, that density *is* proportional to the amount of silver; but this conclusion has been first led up to by reasoning to which, I have endeavoured to show, there is some objection. Now, my doubts as to the uniform correctness of that rule depend upon conditions which only exist, to any considerable extent, in the case of rapid plates. The close agreement between the ratios of the quantities of silver present and the densities, in the two experiments given by Messrs. Hurter & Driffield, is remarkable, and I was much struck by it when the experiments were first published; but still, if, as is probable, Chapman's slow plates were used, that does not show that Hurter & Driffield's formula, and not Plener's, was the only applicable one, because, in that case, both formulæ would probably have given identical results.

Messrs. Hurter & Driffield refer to the results of hundreds of experiments; but, of course, it is only from those published that others can form an opinion. I do not find that any of those described in the paper on "Photo-chemical Investigations" clear up the point, and I do not understand that others were specially directed to this matter. As very slow plates were used, as a rule, in those experiments, it is probably only a comparatively small number of them which would bear on the point in question. Even rapid plates vary considerably in coarseness of grain. The method of reading results at densities, too, sometimes obscures rather serious differences. An instance of that appears in experiment 11. A plate, having three gradations, was cut into pieces, one of which was developed with hydroquinone for 2·5 minutes, and another for 7·5. On measuring the densities, the ratio of the 10 C.M.S. part, compared with the 40 C. M. S., was as 1 : 3 in the first case, and as 1 : 2·7 in the other, an apparently close agreement, and quite in accordance with the principles advanced. The 10 C.M.S. density of the denser piece was ·785; this, multiplied by three, would have been 2·355, instead of 2·120, the actual density of the 40 C.M.S. These figures represent transparencies of $\frac{1}{147}$ and $\frac{1}{132}$, so that the actual transparency of the longer-developed piece was, after all, 1·9 times too great as compared with the other.

Against the experiments of Messrs. Hurter & Driffield we may, perhaps, set those of Captain Abney, which I mentioned in my previous letter. In order to test his formula, he experimented with Indian ink, suspended in varying proportions in water, doubling the quantity each time. He tested the opacity by saturating slips of white blotting-paper with each mixture, and measuring the transparencies when dry, and the result was that the figures were in very close agreement with his "law of error" formula; but I find they do not give the least support to Messrs. Hurter & Driffield's views. Thinking, however, that that plan might perhaps be open to question, Captain Abney undertook another experiment, just on the lines of the second one described by Messrs. Hurter & Driffield. A number of gelatine films were prepared, all of equal thickness, and each containing known quantities of finely divided silver, each of the series containing double the quantity of the previous one. The following table shows their transparencies, as found by Captain Abney, and also as they should have been if calculated by the "law of error" formula, to which I have added the densities which would result from his figures. The transparencies probably represent percentages of the original intensity of the light. At any rate, the plain film is given as having a transparency of 73, so that the other numbers must be divided by that figure to give the transparency, to one unit of light, of the *silver* contained in each film. The logarithms of the reciprocals of the fractions so obtained are the figures I have given in the "observed density" column. These, by Messrs. Hurter & Driffield's principles, should progress by doubling each time; but it will be seen that, except in numbers 2, 3, and 4, there is no appearance of such relations between them. In the "calculated density" I have shown the figures as they should be if the assumed equality of ratios between density and amount of silver held good; and in the last column are given the amounts of silver which would be found from Abney's results if calculated on that basis. For these columns I have taken line number 3 as the starting point, as that seemed the most favourable.

Number of film.	Amount of Silver.	Abney.		Hurter & Driffield.		
		Observed Transparency.	Calculated Transparency.	Observed Density.	Calculated Density.	Calculated amount of Silver.
7	64	1·0	1·1	1·863	5·048	24·0
6	32	3·5	3·4	1·319	2·524	16·7
5	16	9·0	8·7	·909	1·262	11·5
4	8	19·0	19·0	·584	·631	7·4
3	4	35·3	34·0	·3155	·315	4·0
2	2	50·6	52·0	·159	·158	2·0
1	1	67·0	67·0	·037	·079	·5
0	0	73·0	73·0	·000	·000	0·0

This experiment favours the view that it is the "law of error" formula, and not that of Hurter & Driffield, nor, I may add, that of Plener either, which gives the truest results; but the fact that we find so much difference in the results arrived at by competent experimenters appears to prove that it is not safe to trust entirely to any yet published formula. Messrs. Hurter & Driffield do not depend on any exact mathematical demonstration, but on the results of experiments, and here we have an experiment which is quite inconsistent with their views.

I had not overlooked the paragraph in the original paper to which Mr. Phillips calls attention, but I understood the writers to refer to the possible errors which might arise from varying colour absorption and reflection, and did not think it would affect my case that the *size* and position of the grains had been insufficiently regarded. Mr. Phillips will find that Captain Abney's paper on the "Law of Error" is given in THE BRITISH JOURNAL OF PHOTOGRAPHY of the 10th and 17th of May, 1889, another paper, dealing with intensification, appeared on the 29th of November of that year. These also appeared in the *Photographic News*. Captain Abney also read a paper on the subject at the British Association, in which he described the experiments to which I have referred. That paper was given in the *Photographic News* of September 27, 1889.—I am, yours, &c.,

H. J. CHANNON.

Blackheath, S.E., March 21, 1892.

DEPTH OF FOCUS.

To the EDITOR.

SIR,—I am quite willing to accept the definition given by Mr. Bennett of equal depth of focus. From this, together with the fact that the circle of confusion is proportional to to the focal length, his theorem follows at once. Mr. Bennett appears to have forgotten that, in his article of March 11, he professed to prove his theorem by showing that the two lenses would give *equal* circles of confusion, from which it would have followed from his present definition, that they had not the same depth of focus. However, that calculation was erroneous, as I showed last week, and I now admit that the theorem is established, assuming the meaning of the expression "depth of focus" to be as given by Mr. Bennett.—I am yours, &c.,

CLIFFORD E. F. NASH.

Cheltenham, March 28, 1892.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPH REGISTERED:—

Thomas Protheroe, Bristol.—*Photograph from an oil painting of Right Hon. W. E. Gladstone, M.P.*

E. J. SMITH.—About eleven o'clock any morning.

ALLISON BROS.—We do not know of any such list.

O.—The new platinotype paper is not yet obtainable commercially.

ZINCO.—Mr. Paul Waterlow treats of the subject in a lecture which we have in type.

G. JONES.—Substitute for the lens nearest the picture one of much shorter focus, by preference a crossed lens.

INQUIRER.—Avoid leather washers; soft metal ones are recommended by many authorities since recent accidents.

A. R. WOOD.—The Photographic Convention is to be held in Edinburgh during the week commencing July 11 next.

W. J. REED.—1. We do not understand this question. 2 and 3. Probably caused by keeping the paper in too dry a state.

H. J. DALBY writes in appreciation of Mr. H. W. Bennett's "thoroughly practical, useful, and easily understandable article on lenses."

E. D.—1. A slow plate and any of the pyro developing formulæ given in the ALMANAC. 2. Instructions for silvering glass are also given therein.

H. H. S.—The metal rims, glasses, and backs for the so-called "opalines" may be obtained from any of the large dealers in photographic materials.

LUX.—The prisms of a stereoscope will, if mounted in the reverse way—that is, the thinner edges to the outside—answer well for a binocular lanternoscope.

ILIAD.—There is nothing novel in the idea of using weak bromide prints as the bases of coloured pictures. Whether you could hope to make a financial success of it, however, is more than we can say.

CAMERA.—1. Yes; we believe the paper is excellent. 2. Most probably such an opening exists, but we do not think that at present a very large trade is to be done in ready sensitised paper in the colonies.

T. PULLING.—Yes; sulphite of soda may be employed as a fixing agent in place of hypo for silver prints, but the advantage of the exchange is doubtful, while, of course, it would involve greater expense.

JAMES E. GOOLD.—No English work is published on the Woodbury process. The process is fully described in the last edition of Hardwich's *Manual of Photographic Chemistry*. "Woodbury-gravure" is not patented.

S. W.—A lantern with a five-inch condenser will be of no use for enlarging with from 5×4 negatives; that is, if all the subject has to be included. If it has, nothing less than a six and a half inch condenser will suffice. The portrait lens will be preferable to the "rapid" as an objective.

RONALD C.—You have misread the instructions, no doubt. The back lens of a portrait combination is of no use for landscape work. For that the front lens, with its convex side next the ground glass, must be used. Simply remove the back lens, and screw the front one in its place in the position mentioned.

J. A. WHETMAN.—With a lens, the back and front combinations of which are identical, it matters not which way the instrument is placed with regard to the negative in enlarging; but, with a portrait lens, it is imperative that the posterior combination be next the negative in order to get the best results.

M.—The pigment with which the mounts are surfaced, or the medium with which it is mixed, is soluble in water, hence the wet print, when applied, dissolves it, and thus becomes stained. Wet the mount with water, and rub it with a piece of white rag, and you will find the whole of the "enamel" can be removed.

B. H. W. asks, if prints were coated with collodion it would not prevent their fading.—Experiment has proved that it does not. To an extent it may by protecting the image from the atmosphere; but if the prints contain within themselves the elements of decay, no outward application will prevent their fading.

ALBERT LEVY (Paris) asks us whether a plate is more, or much more, sensitive to light whilst developing than in the dry state?—He holds that it is, but we believe that the contrary has been determined. As to whether a plate is more sensitive "during the first second's exposure than during the second second's," and so on, we should say decidedly so.

DUNCE.—1. There is no other way than by dividing the equivalent focus of the lens by the diameters of the stops, the quotients being the apertures in relation to focus. 2. By applying the foregoing rule, you will see that the largest stop is considerably smaller than *f*-8, its aperture being approximately *f*-11½. 3. Any of the stops may be "a working stop."

A. CORNELL.—Your difficulty in getting sufficient density in the negatives when copying engravings to print black and white, is that you have been using about the worst kind of plates possible, that is, extra rapid ones. The best plates for the purpose, next to wet collodion, are the slowest plates. Plates such as those specially prepared for photo-mechanical work give the best results for this class of work.

OMEGA.—It will be very difficult, we imagine, for you to get a complete set of this JOURNAL from the first volume, as there are not many in existence. The only way is to advertise for one, or, failing to obtain it, advertising for odd volumes. By this means a complete set may be secured. The same with the other work.

B. SEAGOOD says: "I have for some time past been attempting to work photo-lithography, and have tried several of the published methods of working, but cannot succeed. My difficulty is that after the transfer is inked up, the ink cannot be got away from the white portions, even with rubbing. What can be the cause?"—The reason may be that the bichromated paper has been kept too long before use, or possibly the negatives are not dense enough, or the printing is carried too far. These conditions are probably the root of the difficulty.

RECEIVED:—R. C. Phillips and Albert Levy. In our next.

MADDOX FUND.—Additional subscription: Lewes Photographic Society, 1*l.* 1*s.*

THE date of publication of the *International Annual of Anthony's Photographic Bulletin* has been altered from June to December.

THE Exhibition of old silver prints, now on view in the rooms of the Photographic Society of Great Britain, will remain on view till April 12.

PHOTOGRAPHIC CLUB.—April 6, Dark Room Appliances, and paper by Dr. Jeserich on *Photography as Applied to the Detection of Crime*. 13, *The Choice of Lenses*, Mr. J. Traill Taylor.

THE Catalogue of the Camera Club Exhibition of Members' Work is a most artistic production, worthy of preservation as a souvenir. From it we learn that there are 86 exhibitors and 236 exhibits.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—April 7, *Collodio-bromide Emulsion*, Mr. Alexander Mackie. 14, *The New Platinotype Paper*, Mr. W. H. Smith. 21, Dr. Jeserich's paper on *Photography and Crime*, illustrated by slides; also Indian and Colonial slides. Visitors are welcomed.

BRITISH ART PHOTOGRAPHY.—King Leopold opened the Exhibition of British Art Photography at the Cercle Artistique, Brussels, on Saturday last. His Majesty was accompanied by his nephew, Prince Albert, and a numerous staff. Several of the Ministers and a large number of the British colony were also present. The King made a minute inspection of the various specimens, and complimented several of the exhibitors, whose names we have already given.

AMONG the pictures shown at the last meeting of the Vienna Club of Amateur Photographers, and that of the Vienna Photographic Society, those of Mr. T. S. Bergheim and Baron Albert Rothschild excited particular interest. Bergheim's portrait studies and groups (scenes from the seraglio) received unstinted praise even from eminent painters. It is to be noted that he takes his pictures indoors, and uses ordinary uncorrected lenses for his portrait studies. Baron Rothschild displays so much earnestness, knowledge, and artistic perception that he could at any moment make his living as a professional photographer did he not prefer the lucrative position of chief of the great Vienna banking house.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN AFFILIATION.—Meeting of Delegates, March 21, Mr. W. Bedford in the chair. Present:—Messrs. A. Mackie (North London P. S.), J. J. Thornton (Southsea A. P. S.), A. J. Golding (Holborn C. C.), P. Everitt (London and Provincial P. A.), C. H. Desch (Finsbury Technical College P. S.), E. W. Parfitt (North London P. S.), S. Hodsoll (North Kent P. S.), F. W. Pask (London and Provincial P. A.), J. W. Marchant (North Middlesex P. S.), F. W. Cox (North Middlesex P. S.), W. White (Ealing P. S.), A. F. Taylor (Ealing P. S.), Robert Steele (Leeds P. S.), F. P. Cembrano, jun. (Richmond C. C.), T. A. Pope (P. S. of India), C. C. H. D'Aeth (Dorset A. P. A.), G. L. Addenbrooke (P. S. G. B.). The Chairman announced that, by permission of the President of this Society, Dr. Jeserich's paper had been put in circulation, but the subject of circulating advance proofs of papers was in the consideration of the Council. Mr. Addenbrooke explained the decision of the Council as to the funds that were to be placed at the disposal of the delegates. After considerable discussion, Mr. P. Everitt moved that the Council be invited to confirm their resolution as applying to the current year only. Mr. R. Steele seconded this motion, which was carried. The advisability of appointing an Executive was then considered, and it was finally decided not to appoint an Executive but to delegate the work to sub-committees. Mr. Everitt inquired whether there was any prospect of special lectures being given, when a long discussion ensued, but nothing was decided upon. Finally, Mr. Cox moved that a London Sub-Committee be appointed to carry on the work till the next meeting of delegates. This was seconded by Mr. Steele, and it was decided that the existing Committee, consisting of Messrs. E. Clifton, P. Everitt, A. Mackie, and T. A. Pope, should form the Committee. Mr. Addenbrooke moved the addition of Mr. Bedford; this was seconded by Mr. Mackie, and carried.

CONTENTS.

THE BRITISH
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STEREOSCOPIC PICTURES WITHOUT A STEREOSCOPIC CAMERA.

Because this article is written in the interests of the large class of photographers who are the possessors of only single cameras, let it not be thought that we are indifferent to the great importance and advantage of employing binocular cameras for purposes of stereoscopic photography. We ourselves invariably employ a camera of the latter class, the one we use being what is known as double quarter-plate size. Ordinary half-plate, or even 8 × 5 cameras, also answer well, it being assumed that a pair of similar lenses and a division in the camera are employed.

We have on former occasions stated, as the paramount condition on which stereoscopic pictures must be obtained, is that of two different points of sight being necessary for each picture. These points need not necessarily be far apart, a distance of even so little as one inch, under exceptional circumstances, up to three inches sufficing.

If a camera be fixed upon its stand by a screw, not close to the front, but nearer to the back of the camera, and a picture be taken, the mere act of rotating the camera on the stand to a very slight extent will cause a displacement of the lens from its original position to one which may, according to the size of the camera and the position of the centre of rotation, vary to one, two, or more inches from the original position. In the pictures taken with each position there will be much in common. One will have at its margins some subjects not to be found in the other; but, when such portions of the scene as are embraced are compared, they will be found to be identical, yet different—identical as regards the subjects themselves, yet different in regard to the relation of one part to the other. This subject cannot well be elaborated in an article so brief as we purpose the present one to be, but the thoughtful photographer—and we gladly recognise many such among our readers—will not fail to appreciate its possibilities in this direction.

It involves, and so do other systems to be described, the non-simultaneity of both exposures. Good friends, we have not in our mind's eye, at present, instantaneous views of street scenes, boating or horse races, but those of quiet life, in which figures in the foreground are an unrecognised entity; these latter must be taken by a binocular instrument.

But if, by a little forethought, the photographer has considered the propriety of having attached to his camera stand a scale of, say, ten or twelve inches length, to which he may slide his camera from side to side, in order to obtain pictures from the various points of view requisite to give stereoscopic effect, then is the condition equally well fulfilled.

It is the relation of the point of sight to the sitter that determines stereoscopic relief. If a subject, when photographed—the camera being fixed at a definite point—be then rotated in even the slightest degree and then photographed; then will two pictures taken under these different conditions be different. We have elsewhere stated that a stereoscopic photograph of a subject, such as a human figure, a pot of flowers, or similar object, may be obtained if the subject be rotated ever so slightly between the first and second exposure. Let a sitter be placed upon one of the office chairs, the seat of which rotates upon a central axis, like that of a piano stool. After the first picture has been taken, let the chair be rotated in the slightest degree, and a second picture be then taken. The sitter, of course, must remain perfectly still while the rotation is being made and a second plate inserted and exposed. Care must be taken that the rotation is not carried too far, else will a too-exaggerated degree of relief be the result. Let it be noted that the stereoscopic effect in this experiment is confined to the sitter only in relation to each part of himself, and not to that between him and the background, which ought, in this case, to be quite a plain one.

PHOTOGRAPHING ON WOOD.

That it should have received the commendation of several wood engravers and others professionally interested in the subject, who were present when Mr. W. J. Rawlings demonstrated a process of printing photographs on wood for engraving purposes, before the members of the London and Provincial Photographic Association last week, is, perhaps, the best praise that could be bestowed upon the method, which will be found described by himself in another part of the Journal. Some of the salient points of the process, however, strike us as being so useful that we shall here take occasion to particularly indicate them, not less in recognition of their practical value than as conveying an idea of the variations upon older methods which Mr. Rawlings has introduced.

Mr. Rawlings first prepares the surfaces of his blocks with a mixture of zinc-white and albumen, which, besides serving the useful end of giving a white ground to the finished picture—a great convenience, we should think, to the engraver—also, if we mistake not, fulfils other functions in the course of the process, one of them possibly being, as was hinted at the meeting, to enter into combination with the silver nitrate of the sensitising solution to form silver carbonate.

When the surface of the block is ready for sensitising, silver nitrate in plain collodion is applied to it, and, this film having

been dried over heat, the collodion is removed by ether and alcohol. The sensitising operation is then repeated, and the second film of collodion also removed, thus leaving the block sensitised with a mixture of nitro-carbonate of silver on zinc-white and albumen. The sensitive surface, which is said to be about as rapid as albumen-silver paper, is then ready for printing under a negative in which the right and left sides are reversed. For small blocks Mr. Rawlings uses clips for holding the negative and block in contact, and for large ones a frame of special construction.

Up to this stage no water has come into contact with the block, and indeed it is possible by a little dexterous manipulation to retain whatever aqueous solutions may be employed entirely upon its surface. The picture when printed out is fixed by hyposulphite of soda in the proportion of six ounces of the salt to twenty of water, an operation which Mr. Rawlings performed by simply flowing the solution over the surface of the block in the manner in vogue with cyanide fixing of wet plates. The picture is then washed by directing a stream of water upon the surface for fifteen seconds, and, after having the free moisture removed, is dried over heat and is then ready for cutting. In that condition it forms, it is said, an admirable surface for the engraver's work, and, moreover, freely allows of the use of the pencil in alterations.

The preparation, sensitising, and printing of a block on the occasion referred to, and indeed the whole process, was completed in a very few minutes. We gathered that it was possible to produce a block ready for the engraver in about an hour from the time of taking the reversed negative. The washing of the latter is, of course, largely shortened, while drying, according to Mr. Rawlings' plan, is effected most expeditiously by squeegeeing off the surplus moisture with the thick part of the hand, and completing desiccation by heat. It will be remarked that the pictures are not toned, while their perfunctory washing and fixing is, of course, dictated by an absolute disregard of the dread of fading. The second sensitising of the block, according to the opinion of the originator of this method, gives better results than would be obtained by simply applying a single solution proportionately stronger in silver nitrate.

The process appears to be perfectly adapted for the purposes of engraving line subjects on wood, and, by what we could deduce from the remarks made on the occasion of the demonstration, will be welcome to wood-engravers generally. Not the least pleasant feature in connexion with the process is the freedom with which its sponsor has published and demonstrated its capabilities. We are glad to find that Mr. Rawlings' action in this respect met with very cordial recognition from those who witnessed the demonstration, the most prominent in acknowledging the boon being those who will be benefited by the particulars of the method given.

Having regard to the interest which the subject excites, it may be fitting that we should seize the occasion to outline some of the older methods of photographing on wood which have been found to answer the purpose. In the first of these the surface of the wood is treated with finely powdered white lead and a little water, and, when dry, is coated with a weak solution of mastic and guttapercha in benzole, consisting of three grains each of the two first-named in an ounce of the solvent, which does not leave any film on the wood, but serves to fix the white pigment. The whites of several eggs having been beaten to froth, and salted with four grains of chloride of sodium and eighteen minims of strong ammonia to each egg, is kept in a warm place for about a month, water being added to make up for the loss by evaporation, and after filtration is applied to the block with a brush. When dry, the surface is sensitised with a forty-five-grain silver solution, also by means of a brush. The operations of printing, fixing, and washing are needless to describe.

Besides the collodion transfer system, which is probably thoroughly familiar to most wood-engravers, and which, therefore, on the present occasion we shall not treat of, it is perhaps not so well known that the carbon process may be adapted for the purpose. In this a specially prepared tissue is necessary, and when sensitised a print is taken under the negative in the usual way. The face of the wood having been slightly gelatinised, the print, after being immersed in cold water, is squeegeed face downwards in contact with the block. The paper is stripped from the gelatine in warm water, and development of the picture is then proceeded with until all the details are visible. In this method a reversed negative is, of course, not required.

It will be remarked that in the method described by Mr. Rawlings the collodion film is removed before exposure; but in that now about to be mentioned and previously published elsewhere this removal is not effected until after the print is made. The method in question is that of applying a mixture of silver and uranium nitrates in collodion to the surface of the wood. Two ounces of ether and four ounces of alcohol, saturated with nitrate of uranium, are mixed with two ounces of alcohol in which thirty-two grains of silver nitrate have been dissolved. The mixture being filtered, fifty grains of soluble cotton are added, and after dissolution, and settling in a dark place, the collodion is ready for use. This is applied to the previously prepared surface of the wood, and the print made by contact. Fixing is accomplished by a dilute solution of ammonia, and when dry the application of a mixture of ether and alcohol removes the collodion film, and leaves the picture in the wood itself.

Both the collodio-chloride emulsion and blue printing processes are applicable to the production of photographs on wood, but enough for the present has probably been said to indicate the considerable variety in the methods of working which are available. Some of these, as well as others not now touched upon, may form the subject of a more detailed descriptive article at some future time.

Photographers' Half-holiday.—We understand, from a communication in a local paper, that the Greenock firms of photographers have agreed to close their places of business on Fridays during the season at two o'clock in the afternoon. Considering the long hours which most assistants have to work in the summer months, this example is worthy of imitation.

The Paris Photographic Exhibition.—This Exhibition, which opens in the course of the present month, as already announced, has received support from most European countries, as well as from the United States. We are not told to what extent English exhibitors have contributed. While the Exhibition is open there will be as additional attractions frequent balloon ascents. We hope a batch of successful balloon photographs will result. By the way, we observe that France during this year is to suffer from a serious outbreak of "the international exhibition disease," such as we had in this country the last and preceding years, many large French Societies having decided to cover themselves with glory in this manner. Here the idea has been rather overdone, and we are glad that this present year of grace is to be a quiet one from an exhibition point of view.

Cause of Streaks and Tears in the Wet Collodion Process.—Those of our readers who use, or who have used, the wet-collodion process, know the extraordinary way in which the surface solution behaves when the plate is withdrawn from the bath. For no apparent reason streaks and tears of liquid form or patches come upon the plate where the liquid is quite driven away. The cause, or one cause, of these appearances is shown in a very pretty lecture experiment illustrated in a recent number of *Nature*. We need not reproduce it here, but will simply explain that a drop of water is caused to form at the end of a pipette, and there remains adherent to its point, when, upon a quantity of ether being brought into proximity, the following phenomena present themselves, and fully illustrate the action of the bath solution we speak of. "As the ether is brought up, the absorption of its vapour diminishes the surface tension over a small area of the drop of water, and currents, made visible by suspended dust, appear to pass from the interior towards the weakened spot. Bringing the ether still nearer, the drop often becomes much agitated, and finally, when the distance is reduced to about 4 mm., it falls away from the tube." We have often performed a still simpler experiment which can be repeated without any apparatus. Bringing the mouth of an open bottle of ether towards the surface of a perfectly wet negative, the surface liquid will be caused to recede and leave a portion of the negative almost dry in comparison.

Private Stills.—It is generally understood that no photographer—nor, indeed, any one—can keep a still, even for distilled water, without first obtaining permission from the Inland Revenue authorities; but, in last week's *Chemical News*, Mr. Wm. Ackroyd, of the Borough Laboratory, Halifax, holds a contrary opinion. He writes: "The law regarding stills was never meant to apply to those in use in private laboratories or chemical factories. I was recently engaged in a case, Regina v. Illingworth, in which it was successfully contended by the defendant's solicitor that the intention of the Act is to prevent the manufacture of liquors which are illicit, and surely distilled water is not one of them! In the case mentioned, the Revenue people were attempting to impose a licence on a manufacturer who used a sulphate of ammonia still. The Bench of West Riding magistrates decided that 'this still is not within the meaning of the Act.'" This is all very satisfactory as far as it goes, but it goes to prove the view the Revenue authorities hold, and the user was put to the trouble and expense of defending a suit at law. Further, they appealed against the magistrate's decision, but the death of the defendant put an end to further proceedings. But there is more to be said. Messrs. A. J. Warren, makers of methylated spirits, write, in the same issue, to say that another correspondent "has legally incurred a fine through having a still on his premises without either having paid for a licence or having permission from the Board of Inland Revenue to use the same." His advice is to "address his request to the Commissioners of Inland Revenue, Somerset House, London, showing clearly that the still is used by him for chemical research. The Board of Inland Revenue are very ready to allow stills free of excise licence when it is proved beyond a doubt that they are wanted for purely scientific purposes; but *they must be asked permission first*. They have, in the last few month, also, to our certain knowledge, given permission to several directors of laboratories to obtain unmineralised methylated spirit. We have had no case of this kind refused, and have forwarded several applications on behalf of the heads of laboratories to them." Now, after these utterances, it is perfectly clear that any one endeavouring to use a still would be foolishly running the risk of incurring great expense, while, at the same time, a simple course is open to him of obtaining what he needs by the expenditure of a little time and a few sheets of paper. We have referred at length to these two subjects, as they are of great importance to many of our readers.

VARIATION IN COLLODION EMULSION WORKING.

So far we have spoken only of utilising spoilt or defective emulsions; but obviously, if the process recommended should prove to have any special value, the emulsion may be partially sensitised for the particular purpose; indeed, it would seem but natural that the better result would accrue from a preparation which had not developed signs of inherent weakness. However, as already stated, the defective emulsion is quite amenable to suitable treatment, all that is requisite being to free it from any traces of fog that it may have acquired, either from considerable exposure to strong light or from over-ripening in the absence of a sufficiency of acid or other restraining matter.

In addition—and this is more especially the case where a tendency to want of density exists—there must be an excess of soluble bromide of at least one or two grains to the ounce to combine with the silver nitrate to be afterwards applied. The only effect of applying a silver solution to a neutral and fully sensitised emulsion—to a washed emulsion, for instance, from which all soluble bromide has been already removed—would be to produce inevitable fog from much the same causes as those which prevail when fog comes from over-ripening. When the small proportion of free bromide is present, however, it is converted into silver bromide of the most rapid, as well as density-giving, kind, and not only averts the fog, but confers those qualities in which the emulsion was previously deficient.

Supposing the emulsion to be only wanting in the capability of giving density, it is only necessary to supply the requisite quantity of free bromide, and the most suitable for the purpose is perhaps the ammonium salt. But should there be any fog present, as will almost invariably be the case under the circumstances, unless the emulsion has already been submitted to treatment as described in the previous article, it is essential that it be thoroughly cleared. Fortunately this is very easily done, though in the case of an ordinary emulsion it would be greatly to the detriment of its sensitiveness, or, in that of a washed emulsion, practically would destroy its sensitiveness altogether. It is merely necessary to add, in place of the bromide of ammonium, a corresponding quantity of the bromide of a dyad metal, such as copper, which is capable of acting directly upon the partly reduced silver that constitutes the fog, and reconverting it into normal silver bromide. Bromide or chloride of copper, as is well known, not only destroys the undeveloped image, but will reconvert the metallic silver forming the developed image into the condition of bromide, and in the same manner these salts act upon an emulsion in removing fog, though with a serious effect upon the sensitiveness of the preparation, unless very thoroughly removed from the film by subsequent washing.

Bromide of copper, or cupric bromide, is a very inconvenient salt to handle or to keep, on account of its instability. The chloride forms a more definite and stable compound, readily obtainable and easily kept, and might probably be used alone in place of the bromide. Where, however, it is not considered desirable to introduce chloride of silver into the film, the employment of cupric chloride cannot be recommended, except in conjunction with an equivalent of ammonium bromide, by which, of course, the soluble silver salt would be converted, leaving the cupric chloride free to exercise its clearing action.

A somewhat similar, if not identical, effect is produced by using ammonium bromide in the first instance, and afterwards shaking up with the emulsion a small quantity of finely powdered cupric sulphate—the ordinary "blue vitriol" of the shops. By this method of treatment the ammonium bromide is decomposed cupric bromide, and ammonium sulphate being formed, and any excess of the sulphate, being insoluble, remains to be filtered out.

Still another, and perhaps the best, plan, all things considered, is to prepare an alcoholic solution of bromide of copper, and to estimate its value volumetrically in order to avoid the inconvenient process of obtaining the salt in the crystalline form. In alcoholic or ethereal solution the salt appears to keep very well. We have kept it without appreciable change in this manner for several months; but any application of heat or other means of evaporation almost invariably decomposes some portion of it. When the solution is once obtained and approximately estimated—for this purpose analytical precision is quite unnecessary—it will retain its qualities for a long time, and so many minims may be taken as representing so many grains.

To prepare the solution of cupric bromide, weigh out equivalent proportions of bromide of ammonium and sulphate of copper, both finely pulverised and carefully dried. The latter salt in its crystalline state contains a certain proportion of water of crystallisation, which may be driven off by exposing the powdered crystals to a gentle heat if prolonged for a sufficient time, the result being a perfectly white powder. This treatment is not absolutely necessary, but it is to be

preferred. The proportions of the respective salts will be four parts by weight of ammonium bromide to five of crystalline cupric sulphate, which may be powdered and dried after weighing. The two are then mixed thoroughly in a glass mortar, or other convenient vessel, when if any moisture be still present, a green colour will be developed; but, if quite dry, nothing beyond a slight greyness is produced. Next pour on a small quantity of strong alcohol—we prefer the pure absolute alcohol, though an inferior grade will answer—or sulphuric ether, the cupric bromide being very soluble in either liquid, when a deep brown, almost black, solution will be instantly formed. Cupric bromide, like many other salts, exhibits dichroic properties, according to whether moisture be present or not. In aqueous solution, or when an appreciable quantity of water is present, the colour is green; but in alcoholic or ethereal solutions it exhibits a variety of tints, varying from lemon-yellow to nearly black, according to the degree of concentration and other circumstances.

Pour off the first quantity of alcohol as closely as possible, and apply a fresh lot, repeating the process until nothing remains but a colourless or slightly grey powder; then make up the volume of the solution to something having a definite relation to the quantity of bromide used in the first instance. Thus, if 100 grains of ammonium bromide were used, and the volume be made up to one ounce, every five minims will represent, as nearly as possible, one grain, and if, on testing the solution, that be found to be approximately correct, it will be quite near enough for our purpose.

Whichever method of forming the cupric salt is adopted, it is desirable to allow the emulsion to rest for at least twenty-four hours after its addition, as the action proceeds rather slowly in the attenuated state of solution. In cases of very bad fog a much longer time may be required, but we have never known a case of fog so bad that t would hot eventually succumb to this treatment. When the emulsion has been once cleared in this manner, it will remain in good condition indefinitely, or, at least, its lease of life is dependent rather on its organic constituents than the inorganic; that is to say, the pyroxyline may become decomposed by age, and the emulsion lose its power of suspending the silver bromide, but the latter will not lose its useful properties. This addition of a cupric haloid, in fact, constitutes an admirable means of indefinitely preserving an emulsion when, as in the present instance, extreme sensitiveness is not required.

If the emulsion in its present condition be spread upon glass, washed until the volatile solvents have been removed, by which time the remaining soluble constituents will have been practically removed also, it will be found, though slow, to give a beautifully clean image. If it should happen to be an emulsion that has undergone this treatment owing to its want of density, that defect will still remain; for the rebromising has no power to increase the organic properties of the emulsion. If, on the other hand, the emulsion is freshly made from perfectly suitable materials, the probabilities are that the character of the image will be the very reverse as regards vigour; that is to say, if a sufficient exposure be given, the density and contrast will be such as to render the emulsion particularly suitable for photo-mechanical work. Even when it does not run particularly to density, the beautiful clearness and absence of fog or veil will recommend the films, especially for the production of lantern slides by contact. For camera reduction, the exposure required would, in most cases, be too long.

It may here be remarked that it is useless to attempt to expose the plates previous to washing, as, until the soluble salts are removed, the films are practically quite insensitive to light, even full daylight. We have purposely exposed a coated plate to diffused daylight, subsequently washed and exposed it in the camera, producing an image of the most irreproachable clearness. It is hardly necessary to add also that the emulsion itself is even less affected by light, for, even if its outer surface layer were actually discoloured, the cupric salt present would, in a very short time, restore it to its original state.

The emulsion is not, however, primarily intended to be employed in this state, but to be first treated with a solution of nitrate of silver. This may be of any convenient strength from ten grains upwards, the sensitiveness of the resulting plates depending, in some measure, upon the quantity of silver present. A five-grain solution may be used if a comparatively slow plate will satisfy; but with this feeble bath there is a tendency to want of vigour. Ten grains to fifteen we consider the best strength for general purposes, but it may be increased up to thirty or forty grains where very rapid films are desired, or where more than the excess of bromide we have given is used. There is, however, in our opinion no adequate advantage gained by going above fifteen grains.

With regard to the preparation and use of the silver bath, none of the precautions surrounding the old silver bath are needful. The silver is simply dissolved in ordinary water and filtered. It is necessary to apply it in a dish or other vessel, owing to the impossibility otherwise of applying it uniformly to the surface, as necessarily the silver bath must be applied before the plate is washed. It is not necessary to acidify or otherwise add to the solution, nor does it appear essential that the bath shall be absolutely kept for this one particular purpose, a sensitising solution for albumenised paper, for instance, having given perfectly satisfactory results. In point of fact, the copper salts employed appear to exercise much of the functions of free acid, as observed by Mr. M. Carey Lea many years ago.

In the interests of uniformity of result, it is desirable, when this process is used regularly, that a considerable bulk of solution be employed, otherwise its strength will rapidly alter and irregularity ensue. Under such circumstances, nothing better than the old dipping bath could be used, but for occasional purposes an ordinary dish may be substituted.

(To be concluded.)

CAN SILVER PRINTS BE MADE PERMANENT?

The small collection of early silver prints now to be seen at the rooms of the Photographic Society of Great Britain, as we said last week, is both an interesting and instructive one. It is almost to be regretted the idea of getting together such a collection was not made more widely known, as, no doubt, it would have been more complete than it is. One thing that strikes the visitor on examining the photographs is, cannot something be learnt from them with regard to making our prints more permanent in the future?

For some years past it appears to be an almost recognised thing, both by the public and the profession, that silver prints must necessarily fade after a few years of existence, and so generally has this idea been accepted by most people that no attempt is now being made, or is, apparently, likely to be made, to improve matters. Indeed, we recently heard it remarked, in reference to this topic, that we were "going from bad to worse," as the majority of prints made during the last two or three years were fading in a shorter time than were those produced seven or eight years ago. Therefore, as a matter of fact, as regards stability we are retrograding.

It has been stated over and over again by theorists that silver prints cannot be made permanent; but, in face of this, there are now on view in the Exhibition some prints that were made in the early fifties which show no signs of fading proper. What slight change there may be in them is not greater than there would have been in engravings, had they been kept under analogous conditions. In fact, in some instances, it is less, particularly if the latter have been made on some of the papers now in the market and used for printing purposes, which rapidly become discoloured by exposure to light. In some of the exhibits the prints themselves seem to have suffered less than the mounts when they had been kept in the damp. In face of these, who will affirm that silver prints cannot be made, to all intents and purposes, stable?

If only one print in a thousand, nay, ten thousand, proves permanent, it establishes the fact that silver pictures do not of necessity fade; also, that if the others had received identically the same treatment in their production, and were kept under the same conditions, they should be equally as permanent. What are the conditions that have rendered one picture permanent while others are evanescent? Why have not all faded alike? That is the problem to be solved. In the collection are two copies of the *Photographic Album*, published in 1855. It is curious to see, in many instances, that the same picture in one book, and made presumably under the same conditions, and at the same time, as that in the other, has changed considerably, while the corresponding one in the other album has changed but little. On the other hand, some prints in one book have suffered more than

have corresponding ones in the other. This clearly shows that the difference, where it exists, is not due to the conditions under which the prints were kept, but to something in the manipulation in the first instance. The majority of the prints shown were toned and fixed at the same time in the old hypo and gold bath.

In the early days of the Photographic Society, when it had the energy of youth, it appointed a committee to investigate the whole subject of the fading of silver prints. The report issued by that body resulted in other methods of toning being sought for that would give a greater promise of permanency. Eventually the present system of alkaline toning was adopted, and that, it was then considered, would prove a panacea for the evil. This process has had a fair trial of over thirty years, with what result we are too painfully familiar.

Some persons have suggested during the past few years that, seeing the permanence of some of the early prints, we should go back to the old system of toning and fixing in one operation. This suggestion should not, however, be acted upon without due consideration, for there is no question that, theoretically at least, the present system ought to yield the more stable results. Another point is, that it is very doubtful if, with the present lightly sensitised and highly albumenised paper used with the thin negatives of the present day, such brilliant prints could be obtained as by the process now in vogue.

It is to be regretted that the subject received so little attention the other night from the members of the Society and others interested in photography. The question of the permanence of the prints is, or ought to be, one of the most important matters in the photographic world, for there is no doubt that the process has yet to be invented that will supersede silver prints for general every-day work. Hence, for the credit of the art, they ought to be made reasonably permanent, and, in face of examples before us that have endured for something like forty years, it is undeniable that they may be.

Would this topic not be a suitable one for discussing at the next Photographic Convention, or at a general meeting of the Photographic Society, seeing that that body is now more inclined to deal with purely technical matters than it has been hitherto? Possibly, under the affiliation scheme, other societies might be induced to associate and take up the subject generally.

CONTINENTAL NOTES AND NEWS.

Two New Developers.—A few weeks since we announced the imminent introduction of a new developing substance—metol. Two others are stated to have formed the subjects of some experiments by Herr Schmidt, of Frankfort-on-the-Main. They are, according to the *Correspondenz*, methyle-para-amidophenol-meta-kresol and para-oxyphenyl glycin—both derivatives of para-amidophenol. Happily, they are called, for short, methol and glycin respectively. They are employed in one-solution developers, and, of course, are very energetic. All new developers are!

The Aluminium Light.—M. Villon finds aluminium superior to magnesium, inasmuch as it burns slower and does not produce any smoke. The flame is also just as actinic. He has succeeded best with a lamp, into the centre of whose flame a jet of oxygen is passed, the powdered aluminium being then projected on to the flame in the usual way. He recommends the following mixture as giving a very powerful light:—

Powdered aluminium	100 parts.
Lycopodium	25 „
Nitrate of ammonium	5 „

Coloured aluminium lights for scenic purposes are obtained in the ordinary manner, that is, by employing the various salts of strontium, barium, copper, &c.

Sunday Photography in Germany.—Recent enactments have prohibited certain forms of labour on Sunday throughout Germany, which comprehends the practice of portrait photography. Whereupon the Hanover Photographic Union and the German Photographic Union have made long and strong representations to the Minister of Commerce and the Imperial Chancellor, stating the case on their own behalf as well as on the parts of their assistants and the public, and begging that the restrictions sought to be imposed on professional portrait photography on Sunday should be relaxed in the interests of all three classes. We have not heard the results of the appeals.

Copper-Uranium Printing Processes.—M. Letellier in the *Revue Photographique*, gives the following particulars for obtaining prints of a red tone:—Seventy-two grammes of nitrate of uranium and twenty grammes of nitrate of copper are dissolved in a small quantity of water, the solution being neutralised with carbonate of soda and made up in bulk to a litre. Paper sized with gelatine or arrowroot is sensitised in the solution for a minute or two, and dried in the dark. Printing is carried on until the image is faintly visible, when it is developed to its full intensity by an eight per cent. solution of potassium ferrocyanide. The picture is then washed and "fixed" in plain water. For sepia tones the uranium-copper solution is neutralised with ammonia, and the image is developed on a two to three per cent. solution of potassium ferrocyanide.

Development shown on the Screen.—M. Molteni, at a meeting of the Photo-Club de Paris a few weeks since, is stated to have thrown on the screen the image of a plate undergoing development. The exposed plate was placed in an upright (?) glass dish, containing the developing solution, in the position, we suppose, although it is not so said, usually occupied by the slide-carrier, so that, as we are told, the members could witness on the screen the growth of the image on the plate. The demonstration is said to have been successful, but we should like to have had a few more particulars; for instance, what was the colour and shape of the glass dish, and was the picture fogged or not? At any rate, if the idea is a practicable one, we hope to see it imitated in this country. In such a manner development could be demonstrated in the lecture-room, presumably in white light.

Kite Photography.—At the same meeting M. Londe exhibited a number of photographs taken from a kite by M. Wenz, of Reims, which are said to have been irreproachable. The apparatus can be employed either vertically or horizontally, and the shutter is controlled either by a time-match or by a current of electricity.

Experiments with Rapid Dry-Collodion Plates.—Dr. Miethe has been experimenting with Gaedicke's rapid dry-collodion plates, and has published the results, which are of considerable interest, in the *Wochenblatt*. Photographing a well-lighted view, and using a small stop, he exposed for four and two seconds respectively; using a large diaphragm, he took an out-door portrait in one second; copied an oil painting, with the smallest opening, in four seconds and two seconds. The exposures proved to be: No. 1, over-exposed; 2, about right; 3, slightly over; 4, over-exposed for the yellows; 5, correctly exposed. Development in all cases was completed with the properly exposed plates in about thirty seconds; with the others, in forty to fifty. He states that the orthochromatic effect obtained was very remarkable, the colours being reproduced according to their values better than they would have been on a plate treated with argentic erythrosine. The grain of the deposit appears under the microscope to be finer and more regular than that of gelatine plates.

Photo-micrography and Crime in France.—It must not be supposed that Dr. Jeserich, of Berlin, is alone in the application of photography conjoined to the microscope to the detection of documentary falsifications. In a recent number of *La Nature*, M. Albert Londe has an article, from which it may be deduced that French men of science and the State authorities are just as alive to the enormous advantages of photo-micrography as the coadjutor of justice as their eastern neighbours. M. Londe relates a case of fraud, detected by means of photography, such as Dr. Jeserich had no parallel for in his now well-read paper. It seems that in France gold rings are "hall-marked," so to speak, by being "punched" with very small and finely engraved marks and countermarks, representing, for example, horses' heads and insects. These last, in fact, constitute the

Havre marks, and, doubt having been cast upon the genuineness of those marks upon certain rings, the latter were placed in the hands of expert engravers, who pronounced the marks false. To make the falsity clear enough for a French jury, M. Londe undertook to take photo-micrographic reproductions of the engravings, both genuine and false, and, having done so, the comparatively small magnification of twelve diameters was sufficient to remove all doubt as to the fraud, the differences in fineness of the engraving being enormous. In this case photography supplied most valuable corroboration of expert evidence.

Orthochromatic Collodio-bromide Emulsion.—According to the *Rundschau*, Herr von Hübl's method is as follows: 40 grammes of silver nitrate are dissolved in 50 grammes of water, ammonia being added until the precipitate is redissolved. Thirty grammes of ammonium bromide are next, by the aid of heat, dissolved in 35 c.c. of water and 70 c.c. of alcohol. To 450 c.c. of a four per cent. normal collodion, the silver solution is added in the dark room. Disregarding the slight precipitates formed, the ammonium bromide, still warm, is added, the emulsion being well agitated. After the emulsion is washed and treated with alcohol to remove the last traces of water, it is dissolved in 400 c.c. each of alcohol and ether, 0·5 gramme of codeine added, and left for three or four days, when the eosine solution is added. The silver eoside is prepared as follows:

Eosine	10 grammes.
Boiling water	350 c.c.
Silver nitrate	5 grammes.
Water	50 c.c.

The precipitate is filtered off and allowed to dry in the dark room; 0·5 gramme of this silver eoside and 1 gramme of ammonium acetate are then dissolved in 20 c.c. of alcohol, and a mixture of 6 c.c. of acetic acid in 170 c.c. of alcohol added to it. To sensitise the emulsion one-tenth of its volume of the silver eoside solution just described is employed. Development may be effected either by hydroquinone or pyrogallic.

RATIO OF GRADATION.—III.*

The next experiments were in the direction of under-exposure, and from amongst several I select an exposure of three seconds, at the same distance from the lamp as before, to illustrate the behaviour under modified treatment. With the normal development, the first three tints only were produced, although the action was continued for some time after number three had become visible. Perhaps it was due to this continuation of the development to some extent that the density, especially of the first two tints, was very great, the third, though much thinner, being still very far removed from the clear glass representing the remainder of the scale. This exposure, it will be observed, was, with normal development, too short to reach the effective portion of the scale produced under the original and strictly normal conditions, the gradation in that instance commencing only when this last image ceased.

The comparison slip was developed in a solution of pyro and ammonia, in which all three ingredients were present in far smaller proportions than the ordinary, the alkali, however, being reduced to a less extent than the pyro and bromide. The exact composition of the developer with which the image was brought out was: pyro, one grain; ammonia, one and a half minim; and bromide, one quarter of a grain to each ounce. The intensification on the completion of the image was effected with a solution made up to the strength of three grains of pyro, three minims of ammonia, and half a grain of bromide to the ounce.

Upon the application of the first solution, the first three or four tints made their appearance without much delay, following one another in regular succession, but after the fourth there was a considerable interval—perhaps ten minutes—before number five became visible, and at this stage the three lower tints were undistinguishable, either by transmitted or reflected light. After another long interval, during which the fourth tint had become merged into the three preceding ones, and the fifth had gained in strength, number six became faintly visible, but after that a full half hour failed to bring out any more, though the last two tints gained slightly in strength. The more concentrated solution was then applied, and almost instantly the lower tints commenced to gain density, and, as previous experience had shown me, in proportion to the amount of the light's action they represented. The last two tints, but especially number six, were very little affected by the intensifier, although it was continued until it had produced its maximum effect on the lower tints, as was shown by number two becoming nearly merged into number one.

The final result was a scale of six distinguishable tints, the same number, in fact, as under normal conditions, although lower down on the scale. The contrast in this case between the highest and lowest gradation of the scale was greater than in the normal plate.

Now, looking at these results, it seems to me impossible to deny that the ratio of gradation has been altered, and that very considerably. In the comparison of the two over-exposures, we have eight tints, accompanied by increased contrast with the modified developer, as against only four tints with the normal; and, though I have not the means of accurately measuring the respective densities, to the eye there appears little doubt but that the difference between numbers nine and six—the limits of the scale of normal development—is decidedly less than that between the same numbers on the other scale. Again, in the case of the two under-exposures, the three tints representing the scale of the normal developer include a wider interval than the six tints of the other scale; that is to say, that visually the contrast between one and three in the first instance is greater than between one and six in the other. The ratio in this case can obviously not be the same.

Of course it is open to Messrs. Hurter & Driffield to contend that this mode of development is a departure from the ordinary course, and is therefore not included in their results. I am quite ready to admit this; but, as I have already said, my object is not to attempt to upset their deductions, but to show that the practical photographer has, to some extent, the power of modifying the rates of gradation in very extreme cases, although, perhaps, the method adopted may not strictly come under the heading of fair development. It may be at best but a subterfuge by which a passable result can be obtained where other means fail; but it is undoubtedly the case that the best results and correct gradation can only be secured with proper exposure and development. As regards what constitute the latter, there is sufficient latitude in both to permit of comparatively considerable variations without over-stepping the lines that divide a correct exposure from one that is incapable of giving a good result.

In conclusion, I regret my inability to give accurate measurements of the actual densities obtained, and, failing that power, it would be useless to attempt to establish any definite ratio between the tints of the scale used, which, accordingly, I have not attempted. But it seems to me that the results detailed above show conclusively, without figures or measurements, that the ratio is really altered.

W. B. Bolton.

* Concluded from p. 197.

PHOTOGRAPHING ON WOOD FOR ENGRAVING PURPOSES.

[London and Provincial Photographic Association.]

As photographing on wood is my subject for this evening, perhaps a few words will not be out of place on the art of drawing and engraving on wood. It is generally understood that for illustrating any journal, catalogue, &c., for printing type-high in the ordinary press, engraving must be resorted to in some way or another, either by wood-engraving, photo-zincography, or what is termed the half-tone relief process, the latter being very much used of late for illustrating, principally pictorial or portrait work, but there is no process yet to equal first-class wood engraving for mechanical and kindred subjects.

To produce an engraving for this purpose you must either draw or photograph the subject on the wood, the material used being box-wood, cut end way of the grain, and finished to a true and smooth surface. To draw upon this, it must first receive a preparation of either zinc or flake white to facilitate the drawing. When drawn, it is given to the engraver to cut; then from him it is passed to the electrotyper, who takes as many electros as required, and from these the actual printing is done.

When the artist makes a drawing upon the wood, he does not trouble to draw every line by which degrees of shadow are represented in the engraving; he merely shows the light and shade, and leaves the engraver to translate these shades into lines or stipple, according to which would be most effective.

In most of the periodicals of the day we know that many of the engravings have been photographed on the block from the original design or drawing, thus eliminating any chance of error on the part of the artist in making his reversed drawing on the wood. The application of photographing on wood has become so successful in facilitating the work of the engraver that it has come into general use of late, but all photographs on wood are not altogether satisfactory to the engraver, there being ofttimes a film left which sadly interferes with the cutting of fine work.

Photography was applied to wood-engraving purposes by a Mr. Sperge in 1859, and his process was published in the *Photographic News* of December 16 of that year. It consisted of giving the wood a coating of albumen and then of gelatine; when dry, sensitising with a solution of silver nitrate, and the printing operation performed as for paper. It was then fixed in a hot solution of hyposulphite of soda to remove the gelatinous matter, which would otherwise cause great inconvenience to the engraver in cutting.

Coming to the process I am now using, and which I will demonstrate before you this evening, I can state that in no case does it stain the wood, and can make more certain of obtaining a good image than by any other printing-out process.

In the first place the block must be prepared in such a way as to give it a uniform colour, and to fill up the pores of the wood to prevent staining, this being effected by sprinkling a small quantity of zinc white, and adding sufficient albumen, spreading with the ball of the hand until the coating is even and smooth, and finally finishing with a camel-hair's brush. This operation requires some practice to perform successfully. If rightly coated, it will not give any trouble to the engraver, not even with the finest tints. All blocks will not require the same amount of albumen and zinc white, as some are more porous than others. The right proportion can only be obtained by experience. When perfectly dry, sensitise by coating as you would for a collodion plate with the following solution:—

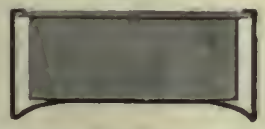
Ether	5 ounces.
Alcohol	5 „
Pyroxyline	20 grains.

When the pyroxyline is dissolved, add seventy-five grains silver nitrate, dissolved in the smallest possible quantity of water. It is best to keep the above in the dark room. This solution gives a slight film, which must be removed from the block before printing. To do this, use cotton wool, saturated with the following solution:—

Ether	5 ounces.
Alcohol	5 „

Dry, and coat again with the sensitising solution before quoted, and apply cotton wool, saturated as before. By giving the block a double coating of collodion, the image prints more rapidly and to a better colour. The block is now absolutely left without any film, and is ready for printing under a reversed negative.

The most simple and quickest method I have found for fixing the negatives and blocks together for printing is by brass clips made for the purpose, such as that shown in the cut. These work very well up to whole-plate size, but for larger blocks I have an apparatus of my own invention, which I shall have the pleasure of showing you.



The time required for printing varies according to the intensity of the light and the density of the negative. With a bright day at this time of the year, with an average negative, one-half to three-quarters of an hour will be found sufficient; with magnesium ribbon, about six or eight feet, burnt at a distance from six to twelve inches away from the negative, will be found ample.

The negative is now removed, and a print is fixed for two or three minutes in a strong solution of hyposulphite of soda, the block then being washed for about half a minute, or even less, when it is placed on its edge to dry, which will take some few minutes. Blocks treated by this process can be produced ready for the engraver under the hour.

W. J. Rawlings.

WHY PHOTOGRAPHS FADE.

III.

The papers made specially for photographic purposes, or for water-colour paintings, by good makers, will be found to stand an exposure to sulphuretted hydrogen for a week without discolouring; how is it, then, that prepared photographic papers, carbon, platinum, and albumenised paper silver prints, will yellow on the surface when put to the same test? That it is not due to the paper is shown by the backs of unmounted prints not changing colour.

As the yellowing must be due to different causes in each process, it will be best to inquire into each case separately. First, as to the carbon process. I have found the surface of the double transfer paper to yellow slightly under the sulphuretted hydrogen test, before any tissue had been transferred to it, which shows that something had been mixed with the gelatine, probably sulphate of baryta and chrome alum, which causes it to discolour; the discolouration of carbon prints, however, is not a very serious matter, because it is but slight, and might be overcome by altering the method of preparing the transfer paper, and is not due to an inherent defect in the process itself. But I am afraid we cannot say the same of either the albumenised paper or the platinum printing processes. I will take the latter first. The yellowing of the whites in platinum prints, when exposed to the same test, must be due to one of three causes.

Either it is due to something used in the sizing of the paper, or the iron is not entirely removed from the paper in the acid baths; or else, as I am inclined to believe is the case, some of the platinum combines with the fibre of the paper, and is not removed. If this is so, it is a very serious matter, especially as printing-out processes are being introduced into the market, which do away with some of the drawbacks to the older process, with its semi-visible image, and no stone ought to be left unturned to make the picture as free from deterioration in the high lights, as it is undoubtedly permanent in the image.

All this beating of the big drum about the permanence of the platinum image by writers in some of our journals seems hardly straightforward, when not one word is said of the yellowing of the paper when exposed to the same tests as those which cause the injury to the silver image, of which they make so much. I yield to none in admiration of the beauties of a good platinum print, but I think all the drawbacks, as well as all the advantages, of any process ought to be stated.

I think it would be as well for the makers of some of the platinum printing-out processes to go into this matter. Only this morning I heard of some prints beginning to go wrong, and they have only been made a few months. If this deterioration is due solely to the platinum combining with the fibre of the paper, there is no doubt a step in the right direction has been made in the cold-bath process, because the platinum is not brought into contact with the paper in the same way as in the other processes.

I now come to the class of photographic papers in which the image is formed of silver, and where gelatine is used as the vehicle instead of albumen. They include the so-called plain salted papers and the various bromide and chloride of silver emulsion papers; and they all, when tested, showed a great advantage over prints done by each of the other processes in what I consider is the most important point, and that is, they did not discolour in the whites of the picture. Perhaps I had better state what my method of testing prints is, because I consider that the only fair way is to expose them to the same conditions, only in a concentrated form, that they would have to undergo by exposure to the atmosphere for a prolonged length of time.

They have to be exposed to a more or less damp atmosphere, containing minute traces of sulphuretted hydrogen gas. Now, dry sulphuretted hydrogen has little effect upon them, and putting them in a solution of sulphuretted hydrogen I do not think a fair test, because the conditions are not the same. I therefore put all the prints I am going to test, comparatively, round the sides of a large bottle, hang a sponge saturated with water from the cork, seal it up, and then pass sulphuretted hydrogen from another bottle through a glass tube passing through the cork.

I have tested prints prepared from probably twenty to thirty different formulæ, and also a large number of prints done on the various emulsion papers in the market. I have seen that they were thoroughly and properly fixed and carefully washed, and every print that I exposed to the above test for more than a week had kept white and unchanged in the high lights, though, of course, the images had been more or less injured.

These tests proved that the whole of the silver had been removed from the high lights of the paper, and that there was nothing in the paper itself that would yellow.

Lately, I was able to examine a number of photographic prints done in 1854 by several of our old noted workers, and none of the plain-paper prints had discoloured in the high lights, so that an absolute test of thirty-eight years was quite in accord with my sulphuretted-hydrogen tests; and, as for the images, almost all of those prints done

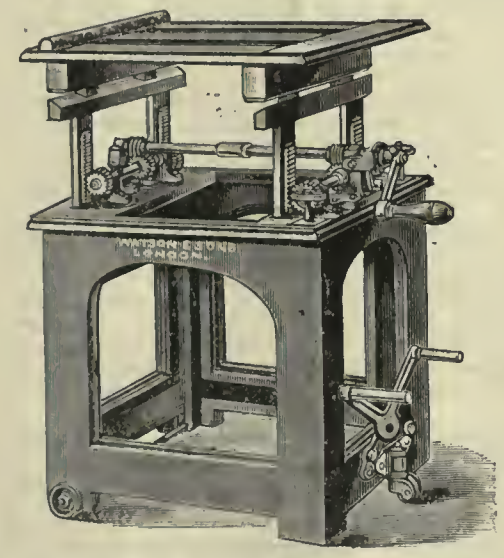
nearly forty years ago had apparently not faded at all, and, as my tests had injured most of the images slightly, we will say that they were equivalent to an exposure of the prints to fair atmospheric conditions for fifty years.

There is no doubt that it was a bad day for the reputation of photographic prints when albumen was introduced as the vehicle, and I am very pleased to see the gradual return to plain-paper silver printing. There is one word of warning necessary, however, in these days of trade competition and wholesale manufacture, and that is, every one who has tried to coat the papers (as received from the manufacturers) with an emulsion knows the vast number of difficulties met with in getting an even surface of emulsion on the paper, &c. To overcome this, various substances have been added to the sizing, &c., to keep the image on the surface and prevent it having a sunk-in appearance. Some of these additions, especially those containing sulphur in any form, will, I am sure, be injurious to the permanence of the prints, and manufacturers ought to be most careful about this matter, both for their own reputation as well as that of their professional customers. HERBERT S. STARNES.

A STUDIO CAMERA STAND OF NOVEL STRUCTURE.

WITH the advent of spring, manufacturers are busily engaged in having novelties for the summer trade made ready for introduction.

One amongst several novelties which were shown us on a visit to the sale-rooms and factories of Messrs. Watson & Son, High Holborn, forms a piece of studio appliance that, we think, will necessarily commend itself not only to the professional photographer, but to all who take portraits, as possessing features of advantage peculiar to itself. This is a camera stand having a square frame, the table surmounting which is capable of being raised or lowered by Archimedean screw-work. This, we are aware, is not new in itself, but where the novelty comes in is found in the fact of *each* of the four elevator pillars being raised and supported by its own rack and pinion, the four racks working with one handle, thus ensuring a high degree



of stability, while, in addition, the front pair and the back pair are capable of being at a moment thrown out of connexion with each other, enabling the hinder pair to be elevated or lowered, while the front remaine fixed, and *vice versâ*. This effects the tilting of even the heaviest camera made, and not only so, but by the action of another piece of mechanism the camera can be raised or lowered while in this oblique relation to the vertical axis, or it can be at once brought to a level position.

By means of a pair of wheels it can be moved in a straight line to and from the sitter, and, by the pressure of the foot upon a lever projecting behind, its motion may be instantly arrested, and the stand rendered as immovable as if screwed to the floor.

Taken all in all, we have not seen a stand which more effectively provides for the rapid and firm adjustment of a large and heavy studio camera. The above cut illustrates our description.

While making this visit we were also shown some cameras specially constructed for photo-micrography, but the pressure on our space forces us to leave over a description.

ELECTRIC LIGHTING IN PHOTOGRAPHY.

[Camera Club Journal.]

WHEN I first had the honour of reading a paper in this room, some eleven years ago, upon my reflector, I was looking forward to the probability, considering the great strides and bounds with which electric lighting was advancing, of being able ere this time to show some important improvement in my invention, if indeed it was not altogether superseded; but, although I have made some changes for the better in details of construction, and with a specially designed lamp secured a steadier light, I must admit that it is practically the same, and I therefore hope you will excuse me if my paper is somewhat in the nature of a *résumé*.

I first turned my attention to the improvement of illumination for portrait photography in 1875, when I patented an improved glass-house, on the principle that every pane of glass visible to the sitter at either end of the studio should face him at an exact right angle, and I effected this by placing the glass in the zigzag crossing of imaginary lines diverging from the sitter's position or chair placed at each end of the studio. My next endeavour, in 1876, was to condense all the actinic light which the dull grey sky of London affords us during the greater part of the year; for which purpose I constructed a plano-convex water lens, using two pieces of plate glass three-quarters of an inch thick, one of which I convexed by heat to the depth of eight inches. The top of this enormous lens, when in its iron frame, reached to the roof of my painting studio; the lens itself, within its iron ring, measured six feet six inches in diameter, and was the largest in the world. When it was first being filled with filtered water (it held 987 pounds) I was standing under it, with my shirt sleeves rolled up, and holding a large sheet of paper in my hand, to watch the increasing brilliancy of a white growing centre sufficiently wide enough to illuminate a head and bust, and surrounded with a dark ring of shadow, when, at the moment of my exultation, there was a terrific explosion, a shower of glass and water, and I found myself on the floor drenched to the skin, and my right fore-arm pierced through between the bones with the point of a huge jagged splinter of glass, cutting the artery, and laying me up for six weeks; fortunately for me, I knew how to improvise a tourniquet. When I recovered and had reconstructed my lens, I realised that it did not go far enough—it was of no use in a good thick pea-soup fog; so I began to experiment with different kinds of artificial light, and having tried the limelight and magnesium light it only confirmed the theory that the relative position of the rays from artificial light is diametrically opposite to that of daylight. In a daylight studio we are flooded with a soft embrace of diffused rays, throwing soft-edged shadows; in artificial light we are struck with the sharp darts of diverging rays from one point, throwing sharp-edged shadows, and even when backing the light with a reflector the direct rays always have the best of it by over-exposing the high light before the reflected rays have time to perform their part. So I saw that it was absolutely necessary to secure such a powerful and steady light that I could afford to do without direct rays altogether, and I constructed a Grove battery of 160 quarts, and secured a Fresnel dioptric light-house lens, four feet in diameter, with a copper silvered reflector of the same size; and using a Serrin lamp, with a platinum screen of four inches to prevent a single ray from escaping, I set to work. I shall never forget my first sitter, a relative of course. He was placed so close to the apparatus that his face turned fiery red, and streamed with perspiration—I literally roasted him. You see I was bound to be on the right side of quantity, considering I cut off all direct rays, and you must also remember those were the days of the slow-collodion process. Of course, the polished silvered reflector was a mistake; it was too much like direct light, and reflected all the heat rays, and so I white-washed it, and from that moment I knew I had solved the problem.

As no London photographer would exploit my invention, and I did not want to lose time, I myself entered the profession in 1877 by starting my present establishment in Regent-street. Fortunately the larger size gas-engines were just then brought out by Crossley, and mine was the first put up in London, much against the advice of Messrs. Siemens, who furnished my first dynamo, and who wrote to me that nothing less than a steam-engine would give a steady light; but an extra heavy fly-wheel overcame the difficulty, and this was the first time that common gas was churned into electric light.

I now constructed a hemispheric reflector, made of zinc, and lined it inside with white enamelled paper, and, as I found my electric arc so large and actinic that I had sufficient light from simple reflection, I abandoned the dioptric lens, with the result of more diffusion, and I have ever since been able to take groups of as many as sixteen people.

At this time I designed the carbon holder, with racket movement, to be worked by hand, which many photographers are now using, but I found in time that this arrangement necessitated too much looking

after, and my present automatic lamp is much more convenient, especially on a drawing-room day.

I tried to replace my single central light of fifty ampères with five or six smaller lamps distributed closer to the surface, but I found, though I might aggregate 100 ampères, I could not obtain the same actinic power; the cause of this is, that in the large lamp the carbons are so far apart that the centre of the positive crater is fully exposed, and the arc is so long as to attain a positive violet colour.

In order to increase its actinic power, I have lately tried to make an improvement in the shape of my reflector by placing around it a zone facing inward, but at such an angle as not to obstruct the light on the sitter. This arrangement throws back and across to the opposite side of the interior of the reflector a portion of the rays of light which were formerly cut off and lost within the small disc; but I find, with the improvement in dry plates, that I really do not need more light; however, it has this advantage, it will help a poor light. This zone should be removable for taking large groups.

Some months ago my studio was connected with the main of the low-tension current of the Pall Mall Electric Light Company, and I sold my old installation after a service of fifteen years. I would here warn any one who contemplates using a supply from street mains for photographic purposes, that the alternating high-tension current is and will be useless until the tearing, roaring noise always accompanying the size of arc that is necessary for good work, say, at least, forty-five ampères, is overcome. I don't think it can be done. I understand several photographers in London have been nearly driven mad with it.

Now, although my light is not as actinic as the brightest sky, still one can take what are erroneously called instantaneous portraits with it. In the group of the Misses Dene I used no head-rest—the exposure was not two seconds, and then, besides the advantage I have of being independent of fog and the night, one can do so much more in the way of obtaining quick changes of effect, and without pulling the sitter about, which would be impossible in a daylight studio. My reflector is suspended with wire ropes running over pullies on a revolving iron frame fastened to the ceiling; and, having a counterweight at the other end, it can be pulled up and down, twisted right and left, and swept round and round by a mere movement of the hand, and, with the aid of a large reflecting screen to illuminate my shadows, photography is a fascinating pleasure, in all weathers, day or night. With the exception of my portraits of the Princess of Wales, which were taken at Marlborough House, every photograph I have ever published or exhibited was taken by my light. I forgot I did place one daylight photograph amongst my exhibits at Pall Mall last year, and I challenged the jury to pick it out.

Some few years ago I built a daylight studio on a new principle for copying large paintings, as I found it impossible to illuminate perfectly evenly large flat surfaces (say, when over three feet square) by one or more artificial lights, for the reason that there is always one corner of the picture nearer to the light in the same room than the other corners, or than the middle.

I have studied, as every photographer must have done, the difference in the effects obtained from light which is reflected from a sunlit mass of clouds and from direct sunlight filtered through gauze or curtains, and I found that this relative difference between cloud-light and sunlight is exactly the same in regard to artificial light. There is a subtlety in the combined crispness and delicacy of the modelling obtained from purely reflected light which no arrangements of gauze or tissues filtering or diffusing direct light can possibly produce; and this proves that in attempting to produce artificial illumination, whether the same be for the painter or the photographer, one should not forget that there is only one kind of light that is worth imitating, and that is the broad and brilliantly white, yet exquisitely soft, reflected light, from a glorious mass of sunlit clouds in the northern sky.

HENRY VAN DER WEYDE.

PHOTOGRAPHY AND PHOTO-MECHANICAL PRINTING.

II.

[Two Lectures delivered before the Officers of the Royal Engineers at the Military School, Chatham.]

ZINC ETCHING.

THE principles of the process of photo-lithography, described to you in the lecture last night, are, by slight variations of working, employed in the processes of photo-zincography and photo-zinc etching, for the production of type blocks. Supposing, now, we take one of the lithographic transfers we have just been dealing with, and, instead of transferring its inked image to stone, we lay it down on a sheet of smooth zinc, the result will be as this, a print on metal which forms the basis of operations for the production of a relief block, *a block on which the lines are raised above the white portions of the picture*, and can be used in the printing press exactly in the same way as a woodcut or type.

Nothing can be simpler than the abstract principles of photo-etching; but, as not uncommonly happens, a considerable amount of skill and experience is required to put these abstract principles into practice.

The theory of etching is, that the surface of a metal, like zinc, is easily dissolved, or etched, by nitric or hydrochloric acid, so long as there is no grease or varnish on the metal to interfere with the dissolving action of the acid. Supposing a piece of clean zinc is coated with wax all over, and it is dipped into acid, no etching will take place, because the wax prevents the acid from touching the metal; but if a drawing is made through the waxed metal with a sharp point, and then the plate is dipped in acid, etching immediately takes place wherever the point has bared the surface of the zinc, and the result would be a sunk or intaglio picture engraved into metal which could be printed from in a copper-plate printing press.

Before we proceed to the etching of such a plate, we ought to tell you how to obtain greasy ink prints or photographs on metal by means other than of the transfer process, and the bitumen process, described to you yesterday. There are several methods, but it will be sufficient for our purpose this evening if we describe one.

The first thing, and the most important thing, is the negative; it must be perfectly sharp, the lines of the subject must be represented by clear glass, and the white paper by dense black deposit, and for the processes we are dealing with the negative must be reversed; that is, the negative image on the glass must be the opposite way round to that on a negative used for printing from direct, the reason being that a reversed picture is required on the metal block, so as to give a *non-reversed* result when the block is finally printed. There are a number of reversed negatives on the table which you may examine after the lecture.

Having obtained a proper negative, the next thing is to print the image on metal. A piece of clean polished sheet zinc, about three thirty-seconds of an inch, is cut to the size required for the negative, and is thinly coated with a solution of gelatine or albumen, water, and bichromate of potash. The plate may be coated with a large camel's-hair brush, or the solution may be flowed over the metal. It is then dried by heat in a non-actinic light, and placed in a printing frame with its sensitised surface in contact with the negative. (Mr. Geddes will prepare before you and endeavour to print such a plate by means of magnesium, and will show you the results of each operation described.)

A few minutes exposure to electric light or sunlight renders the bichromated gelatine insoluble wherever light has obtained access to the plate through the clear parts of the negative, the action being precisely the same as in the case of a transfer. The plate is next covered all over with a thin coating of greasy printing ink, and is then dropped into a flat dish containing cold water. The inky surface of the plate is gently rubbed with a sponge or wool, and the ink coating together with the gelatine leave the plate entirely except where the light has acted through the negative, giving us a similar picture on the metal to that obtained on gelatined transfer paper. At this stage the ink picture on the metal is rolled up with stronger and more ink, and it is then ready for its first etching. As the operations of etching such a plate occupy four to six hours, it is, of course, not possible for us to etch a plate before you, but we have here a series of plates showing the different stages of etching, and as they are handed round to you for examination we will rapidly go over the details of the process. The image on the plate which Mr. Geddes has developed before you first requires rolling up with a stiff greasy ink so as to give the lines sufficient strength to resist a weak solution of nitric acid in water (just strong enough to make the water distinctly acid to the taste) and the plate is kept in this bath for a few minutes, when it is taken out, washed, and again inked, and whilst the ink is fresh finely powdered resin is sprinkled over the face of the plate; the resin adheres to the inked lines, but washes off the bare zinc. The plate is then slightly warmed on a hot plate in order to melt the resin adhering to the lines, so as to form with the ink an acid-proof varnish to protect the lines from being attacked by the stronger acid which is used for the next etching. The acid for this second biting may be about two per cent. solution, and the plate may remain in it for five to ten minutes, the bath containing the acid solution being rocked all the time to prevent air bubbles forming on the surface of the plate, and to ensure even action. After this etching there will be an appreciable amount of what is called "depth" observable, that is, the metal not protected by the inked lines will be dissolved away in a slight degree, and the lines will appear in relief; after this, the operations of inking, brushing with resin, and heating of the plate are repeated, and a third etching is given. The heating of the ink and resin

melts the two together, and has the further purpose of melting it not only on the top of the lines but, as the metal is etched down, the ink flows down the *sides* of the lines as well, preventing the acid *undercutting*, which action, unless stopped, would soon eat out the work from the under side. The inking, melting, and etching is continued in this manner six, seven, or eight times until sufficient depth is obtained to make the lines high enough to ink sharp and clean in a printing press. When the whole of the etching ink is removed the plate is washed, and after one or two finishing or fine etchings it is ready for mounting, when it is trimmed and mounted on a block of mahogany type high ready for the printing press, as those you see before you. Here are finished and mounted blocks with proofs for your inspection after the lecture.

We will now pass on to a further development of this process. Hitherto we have only been dealing with line subjects in black and white. We will now treat with half-tone etching.

HALF-TONE ETCHING.

This important modification or adaptation of the last-mentioned process enables us to produce a type-printing block from hitherto impossible subjects—namely, a photograph from nature, or a drawing in wash. The process has, during the last few years, been so improved upon and developed, that we may safely assert that this method of type-block engraving occupies to-day the first place amongst artistic photo-mechanical processes. Until the principle of breaking up a photograph into minute dots was devised there had been endless futile attempts to convert the gradated tones of an ordinary photograph into a surface printing-block, but the disappointing fact that an inking roller and a printing press absolutely refuse to distinguish anything but lines or dots forced all experimentalists to adopt, in one way or another, the system of dividing up the tone-picture in such a way that it consisted of an agglomeration of dots—dots very close together forming the blacks, dots wide apart the half-tones, and needle point dots the high lights. There are a multitude of ways of attaining this result, and any amount of ingenuity has been brought to bear in rendering the processes as perfect as possible.

Your Sergeant-Major Husband has invented a capital transfer process for breaking up the image on a photograph so as to convert an ordinary photographic negative into a stipple, which can easily be reproduced as a lithographic transfer, or a type-block, by etching a zinc plate on which one of his grained transfers has been printed. We may say that he has not only discovered this useful process, but he has published full particulars, and given it to the world, unlike so many other inventors, who immediately prevent all use of their processes by elaborate patents.

The process, however, for block-making which is most in vogue at the present time is obtained by interposing between the sensitive plate in the camera and the print to be copied a dotted screen or negative which has been obtained by means of photographing an engraved tint of fine-ruled lines. To better explain to you what is meant, we have here a piece of a tint negative, used for this purpose, together with a negative made by interposing a similar tint in front of a sensitive plate in the camera. You will observe, in the half-tone or stippled negative, that the picture is made up of dots, as is likewise this print from the negative on a zinc plate of the image. Here, also, is a finished block, etched on copper by the same process and proof. If you examine the proof carefully, you will observe the dotting we have mentioned. When a similar plate on zinc or copper is etched with acids, the results are like the impression which we show you, and which you will recognise are used now so extensively by so many illustrated magazines, papers, and books. PAUL L. WATERLOW.

(To be continued.) J. D. GEDDES.

THE WET-COLLODION PROCESS.

[Cardiff Photographic Society.]

IN these days of gelatine dry plates it may seem almost useless to devote time and attention to what is now generally considered to be an obsolete process, with all its supposed difficulties and defects; but I hope to show you that it is not the uncertain, troublesome process it is now popularly supposed to be; and I trust I may induce some members of this Society to give it at least a trial, feeling sure they will find it not only extremely interesting, but also capable of producing results unattainable with gelatine plates, whilst the very small cost of materials used in the production of wet-plate negatives should especially recommend it to those amateurs whose means are not equal to their enthusiasm in photographic pursuits.

It is certainly not a process to be commended to that class of amateurs who purchase a Kodak, "press the button," and are content to let the Eastman Company "do the rest." But, to those who delight in doing as much of the work as possible in the art of photographic picture-making, I know of no more interesting instructive process than the now little-used wet collodion, for it allows the amateur, when exhibiting his productions, to exclaim, "I did this myself. It is not an accidental success, but entirely the result of my own skill."

I ask him all seriousness, How much of the credit of a perfect gelatine negative is due to the amateur who exposes and develops the plate? He certainly has the power of selecting his subject, but he has very little control over the character of the resulting negative, except that he may develop it weak, harmonious, or hard, as the case may be; but even in this particular it must to a great extent depend upon guesswork, for it is next to impossible to tell, before a negative is fixed, whether it will be too weak, too dense, or about right.

With the wet-collodion process this uncertainty is entirely done away with, for the film, being so very transparent, enables the operator during development to judge to a nicety what the ultimate density will be when the negative is fixed. Nor is this all, for, in developing a wet-collodion plate, the operator has the power to develop extra detail and density in any particular part of the plate which he thinks may require it, simply by pouring the developer on and off the part in which he desires specially to develop extra detail and density. Further, this power of selection, so to speak, is not confined to development alone, for the same power of modification of the negative is also extended to the process of intensification, either before or after fixing.

Another advantage of the wet-collodion process is, that the result is known to a certainty within a few minutes after exposure, and, as the development is carried out on the spot where and when the negative is taken, the subject is so strongly impressed upon the mind of the operator during the development of the plate, that he has a clear conception of the requirements of the case. This, with the power of modification during development and intensification, enables the operator to impress his own ideality upon the negative. With the gelatine plate this is all changed.

In the first place the plate has to be purchased ready-made, and has to be taken in all the glorious uncertainty as to whether it is good, bad, or indifferent; quick-acting or slow.

Thus, when taking some important subject which it may be impossible to take again in case of failure, the poor operator is likely to get into a frame of mind greatly to be pitied. Add to this that the plate is not developed till possibly weeks or months afterwards, when the operator can have no clear conception of the subject the plate was exposed upon, and also the inability to judge the character of the developed image till it is fixed, leaves the quality of the resulting negative almost as much to luck as to judgment.

It may be said against the wet-collodion process that, as the plate has to be prepared, and also developed within a few minutes of exposure, it necessitates the carrying of baths, chemicals, and tent into the field. But this is not the formidable undertaking it may at first sight appear, whilst it allows of an almost unlimited number of good negatives being obtained with certainty.

The dry plate, even in the field, does not contrast so favourably with the wet plate as regards weight to be carried as may appear at first sight; for, if a number of negatives have to be taken on dry plates, it necessitates the carrying of a number of dark slides, which, with their plates, are both bulky and heavy; besides, the constant danger of light gaining admittance to the plates, either by accident or the carelessness of would-be friends, tends to keep the poor operator in a continued state of anxiety.

With the modern forms of light cameras and stands, a wet-plate outfit for field work need not be much more weighty than for dry plates. A small bottle of collodion, a water-tight ebonite bath filled with sufficient solution to cover the plate, a few ounces developer and a similar quantity of u weak acid, gelatine solution (of which I will speak further on), together with a number of clean glass plates, are all that is required, except the developing tent, which need be neither heavy nor bulky, and may take the form of a light box to carry cameras, chemicals, &c.

The cost of chemicals consumed in the production of wet-plate negatives is so very small as to be considered almost *nil*, so that the difference in the cost of a couple of dozen whole-plate negatives by the wet-plate process would pay for the luxury of a light porter to carry the wet-plate kit into the field, thus reducing the labours of the amateur to less than they would be if he carried his own camera, double slides, and dry plates.

A great deal of misconception exists, and always has existed, as to the *supposed difficulties* to be met with in the practice of the wet-collodion process. If you turn to the photographic publications of some twenty years ago, you will not fail to observe that the great topic dwelt upon was the "Negative Bath," with the host of troubles it was supposed to be afflicted with, which would lead one to suppose

that it was almost, if not quite, impossible to keep the negative bath in decent order. But, in point of fact, nothing could well be simpler, provided common sense be used, instead of the fussy, meddlesome quackery to which the poor, ill-treated negative bath was almost universally subjected. I can only compare the insane treatment to which the negative bath was subjected to the manner in which great numbers of persons treat their liver, taking first a course of Purgeham's pills, followed by another of Astringham tonic bitters; then applying one of Stickham's plasters, and Shockham's electric belts; and, finally, thinking they feel awfully bad, and that, unless they keep up this treatment for ever and ever, they will never get well again. Now, if such misguided folks would only leave their liver alone, or treat it with common sense, they would not only live the longer, but would scarcely be aware that they possessed such an organ as the liver.

So with the negative bath; treat it with common sense, and do not mess it about, and you will experience but very little trouble in keeping it in perfect order.

It is scarcely necessary that I should trouble you with formulæ for bath developer, &c., as Mawson & Swan have just published a third handbook upon the process, which treats the subject in all its details; but I would like to refer to the acid gelatine solution I have previously mentioned, and which I have found extremely useful when working the wet process in the field, as it saves the necessity of carrying either fixing solution or washing water.

The solution is prepared somewhat as follows:—

Dissolve about a drachm of gelatine or glue in about an ounce of glacial acetic acid, then add about a pint of water and an ounce of methylated spirit. (If the acid be not at hand, four or five ounces of strong vinegar may be substituted for it.)

As soon as a plate is developed, drain off the developer and apply a small quantity of the acid gelatine solution, which runs all over the plate, pour off and repeat with another small quantity, which pours off as before, and put the negative into a grooved plate box, to be fixed at some future time, after being well washed. The proportions of this acid gelatine solution may be greatly varied without impairing its results.

To an old photographer like myself the sight of a good collodion negative, with its fine texture, clear shadows, free from the slightest trace of colour, does one's heart good, and makes us sigh for the "good old days" when personal skill, rather than good luck, produced the finest results.

For the production of transparencies for the lantern no process can equal wet collodion, for it not only gives perfect clearness in the lights, but also a peculiar transparency in the shadows which no other process can produce.

In comparing a collodion transparency with one produced on a gelatine plate, they should be placed in the lantern, for it is only by these means that the superior excellence of the collodion transparency can be fully realised.

Compared side by side *out of the lantern*, the gelatine transparency may appear the better of the two; but, when exhibited *in the lantern*, the superior excellence of the collodion slide is at once apparent.

Very excellent slides may be produced with the same collodion, bath, and developer as is used for negatives; but, if the highest results are desired, an older collodion, a more acid bath, and a well-restrained developer should be used. The only drawback to the process is that it cannot be used for making transparencies by contact, it being impossible to place the plate in close contact with a negative without injury.

If it should appear to any member of this Society that I have too strongly advocated the claims of the wet-collodion process, I must crave as my excuse that I have been pleading the cause of my first love, who taught me to "hold the mirror up to nature," and to fix her image thereon.

I will now proceed to give a practical demonstration of the process, first making a negative from a transparency, that you may see how favourably the development of a wet plate contrasts with that of the gelatine dry plate, both as regards the time occupied and facility for modifying the character of the negative. I will then proceed to make a transparency from a negative, showing the adaptability of the process for the production of transparencies for the lantern.

The coating of the plate with collodion, you will observe, is almost identical with the varnishing of a negative, except that it can be done more leisurely. After pouring off the collodion into the bottle and replacing the stopper, proceed to pinch the lower edge of the plate between the finger and thumb, and as soon as the collodion has set sufficiently to retain a definite impression of the thumb, it is ready to be immersed in the silver bath by means of the dipper. This must be done with one slow, steady movement, for, if it be done by jerks or stoppings, lines across the plate will be the result.

After the plate has remained in the bath about three minutes, it may be raised, and if the solution runs off without signs of greasiness it is sufficiently sensitised, and, after well draining, it may be placed in the dark slide ready for exposure.

The exposure in daylight should be about ten times longer than would be required for a gelatine plate of average speed, but as I shall carry out this experimental exposure by the light of a candle, and as the exposure will be five or six minutes' duration; I will utilise the time by describing what I term the "common-sense" treatment of the negative bath.

Now, it is a well-known fact that a *pure* solution of silver nitrate, when exposed to the light, remains clear and colourless, but, if the solution contain any organic impurities, it will (unless it be acid), first become discoloured, and finally become clear and bright, with a black deposit at the bottom of the bottle. Bearing this fact in mind, if a bath gets out of order through impurities being introduced, all you have to do is, first free it from acid by the addition of a solution of sodium bicarbonate, expose to light till clear, when you will have a pure solution of silver nitrate, which only requires the addition of a few drops of nitric acid, and you have a bath in perfect working order.

But it should be borne in mind that the solution must be filtered *before* the acid is added, else the addition of the acid would enable the solution to take up a portion of the organic impurities by dissolving some of the deposit in the bottom of the bottle; hence the necessity of filtering the solution *before* the addition of acid.

I will now proceed to develop a negative on the plate I have exposed behind a transparency to the light of a candle.

You will see I do not require a dish to develop the plate in, as it is held at one corner by the finger and thumb, and, instead of using an ounce or more developing solution for a quarter-plate, I place in a measure about a drachm of solution, and unless my hand has lost its cunning through want of practice of the process for many years, I shall only use about half a drachm of solution to develop the plate, as I wish to develop this plate to full density so as to save the trouble of intensification. To those who have never seen a wet plate developed it will seem surprising to see the rapidity with which the development proceeds, the process being complete in about thirty seconds; but, as the film is so transparent, there is no difficulty in judging when the plate is sufficiently developed, without the uncertainty one feels when developing the opaque gelatine film.

The development being completed, I wash the surface of the plate with a small quantity of water till greasiness disappears, then fix by pouring the cyanide fixing solution on and off a few times, wash with a few ounces of water and dry the plate over the gas flame, the whole process occupying but a few minutes from beginning to end.

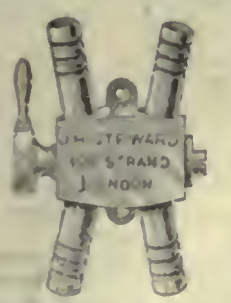
My object in bringing this subject before you has not been merely to entertain you, but to prove to the present generation of amateur photographers that the wet-collodion process is not so uncertain or difficult as it is popularly supposed to be, and thus to induce some of the members of this society at least to take up one of the most interesting and instructive processes connected with the practice of photography.

THOS. FORREST.

Our Editorial Table.

A Cut-off Tap for the Oxyhydrogen Light.

MR. J. H. STEWARD, 406 Strand, has introduced a cut-off tap for the lantern, which, in our estimation, will prove very handy. The advan-



tages claimed are that the operator, having once adjusted his apparatus

and his light, may turn it down and leave it in the certainty, that on returning he has only to turn up the lever handle to get the same light as before. There is a bye-pass in the hydrogen plug by which the gas is not allowed to go out at any time. The whole thing is simple, and is adaptable to any single or dissolving-view lantern, and must prove valuable in enlarging or micrographic work.

The "Nys" Dry Plates.

Mr. Robert C. Murray, 8 Garrick-street, Covent-garden, W.C., the agent for these plates, has submitted samples for trial and criticism. We have found them very sensitive, so much so as to receive a well-impressed image with a momentary exposure of a lens severely stopped down. The image develops up both bright and clearly, with all the requisite gradation and intensity.

THE MADDOX FUND.

Final List.	£	s.	d.
Amounts previously acknowledged	340	14	9
Glasgow High School Photographic Society	1	1	0
Joshua King	1	1	0
Dr. C. Schleussner	5	0	0
Manchester Photographic Society	2	0	0
Seaman & Sons	1	1	0
Thomas Bromwich	0	5	0
John B. Best	0	10	6
Manchester Camera Club	1	1	0
John Carbutt	50	0	0
Total	£402	14	3

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 6013.—"An Improved Photographic Developing Apparatus." A. Brin.—*Dated March* 28, 1892.

No. 6026.—"Improved Means of and Apparatus for Automatically Exhibiting Lantern Views for Advertising and other Purposes." J. Ellison.—*Dated March* 29, 1892.

No. 6049.—"Improvements in Photographic Plates and Plate-holders, also Applicable to Cameras." Communicated by W. F. Carlton. Complete specification. A. J. Boult.—*Dated March* 29, 1892.

No. 6087.—"Improved Apparatus for Washing and Drying Negatives and the like." J. E. Sparks.—*Dated March* 29, 1892.

No. 6123.—"An Improved Plumb Indicator for Photographic and Other Apparatus." G. M. Dixon.—*Dated March* 30, 1892.

No. 6243.—"A New Magazine Camera." S. D. Williams.—*Dated March* 31, 1892.

No. 6276.—"Improvements in Apparatus for taking Instantaneous Photographs." Communicated by L. Rohrmann. E. Edwards.—*Dated March* 31, 1892.

No. 6278.—"Improvements in Film Carriers and Dark Slides for Photographic Purposes." Complete specification. B. J. Edwards.—*Dated March* 31, 1892.

No. 6303.—"Improvements in Photographic Cameras, and in Stands for same." J. B. Brooks.—*Dated April* 1, 1892.

No. 6342.—"Process for Producing Coloured Photographs." Complete specification. V. Mathieu.—*Dated April* 1, 1892.

No. 6355.—"Improved Photographic Magazine Changing-box for Plates and Films with Roller Slide Shutter." C. Grundmann.—*Dated April* 1, 1892.

No. 6361.—"A Combined Photographic Dark Back and Developing Box." A. Brin.—*Dated April* 1, 1892.

No. 6391.—"Improvements in Field and Hand or Detective Cameras, and in Bellows of same, also an Arrangement for Automatically bringing the various parts into position ready for taking the Photograph." F. H. Ibbetson and P. G. Mason.—*Dated April* 2, 1892.

PATENTS COMPLETED.

An Improved Photographic Magazine Camera and Appliances used therewith.

No. 8055. Herbert James Tear, 12, Clapham-road, Stockwell, Surrey, and Arthur Lewis Adams, 81, Aldersgate-street, City of London.—*March* 5, 1892.

This invention relates to an improved photographic magazine camera and appliances used therewith, and our said invention is designed to produce an economical, simple, and effective form of magazine camera, by means of which dry plates or other sensitive surfaces used in photography may be stored for use, and each successively brought into the position in which it is required to be held during exposure, afterwards being removed into a separate receptacle, allowing a fresh or other sensitive surface to be brought into position, all these changing operations and the storing receptacles or reservoirs being entirely within the camera case.

We construct the camera advantageously of an oblong rectangular form, in the front end of which is placed the lens, and in connexion therewith we use any suitable shutter—for instance, a weighted shutter, moving upon an axis and operated upon by levers or suitable attachments.

The end of the case or camera is divided into two parts, horizontally. The upper compartment forms a receptacle for the sensitive plates or surfaces previous to exposure. The upper compartment contains a movable part or sliding partition placed behind the plates, and acted upon by a spring, or springs, which is regulated by means of a cord or other convenient attachment passing through the camera case—advantageously out at the back. The plates are held in position by the spring pressing the said sliding part and forcing them against projections in the body of the camera. The front plate, having no platform or support under its bottom edge on the pressure of the spring being released, such front or foremost plate falls upon a hinged plate or shelf, which is capable of being raised by means of a lever beneath it being acted upon by means of a cord or other suitable attachment, and the sensitive plate then slides into a lower compartment or storing reservoir.

Glazed non-actinic paper, or other convenient material, or a sheath, is applied to the back of each sensitive (or transparent) surface, or same may be mounted or protected in any suitable manner.

When flexible films are used, a rigid substance advantageously glazed is prepared on one side with a suitable adhesive material.

An Improved Photographic Print Washer.

No. 22,758.—George Frederick Firth, Oakleigh House, Stanley, near Wakefield, Yorkshire.—*March* 5, 1892.

The apparatus consists of two metallic tanks, placed one above the other, and in each is fixed a syphon. The prints are placed in loose trays, in a frame, and then put into the lower tank. Water is then poured into the upper tank, and discharged by means of the syphons. The prints are alternately soaked and drained, thus effectually washing the prints.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
April 11	Darlington	Trevelyan Hotel, Darlington.
,, 11	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 11	Lantern Society	20, Hanover-square.
,, 11	Norfolk and Norwich	Bell Hotel, Norwich.
,, 11	North Middlesex	Jubilee Hall, Hornsey-road, N.
,, 12	Derby	Smith's Restaurant, Victoria-street
,, 12	Great Britain	50, Great Russell-st., Bloomsbury.
,, 12	Manchester Amateur	Lecture Hall, Athenæum.
,, 12	Newcastle-on-Tyne & N. Counties	Mosley-st. Café, Newcastle-on-Tyne.
,, 12	Paisley	Committee Rm., Free Lib. & Museum
,, 12	Stockton	Masonic Court, High-street.
,, 13	Ipswich	Art Gallery, Ipswich.
,, 13	Leicestor and Leicestershire	Mayor's Parlour, Old Town Hall.
,, 13	Munster	School of Art, Nelson-place, Cork.
,, 13	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 13	Putney	High-street, Putney.
,, 13	Reading	
,, 13	Stockport	Mechanics' Institute, Stockport.
,, 14	Birkenhead Photo. Association	Association Rooms, Price-street.
,, 14	Birmingham	Lecture Room, Midland Institute.
,, 14	Bradford Photo. Society	50, Godwin-street, Bradford.]
,, 14	Camera Club	Charing-cross-road, W.C.
,, 14	Cheltenham	
,, 14	Hackney	Morley Hall, Triangle, Hackney.
,, 14	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 14	Manchester Photo. Society	36, George-street, Manchester.
,, 14	North Kent	Gravesend.
,, 14	Oldham	The Lyceum, Union-street, Oldham.
,, 15	Cardiff	
,, 15	Holborn	
,, 15	Leamington	Trinity Church Room, Morton-st.
,, 15	Maidstone	"The Palace," Maidstone.
,, 15	Richmond	Greyhound Hotel, Richmond.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

March 31,—Mr. E. Clifton in the chair.

Mr. R. G. F. Kitson was elected a member of the Association.

Mr. W. J. Rawlings read a paper on *Photography on Wood* (see p. 230), and at its conclusion he exhibited a frame of his own contrivance for printing from the negative on to the sensitised wood block. This consisted of a sheet of glass resting on a rebated frame cushioned with indiarubber. Blocks of different sizes could be held in contact with the negative by means of a frame having various screw adjustments. In answer to questions, he said he found ordinary sheet glass flat enough for the purpose. There was no chloride in the sensitising solution.

The Chairman said that carbonate of silver was probably produced by the reaction of the zinc white on the nitrate of silver.

Having exhibited several engravings on wood cut from photographs, also photographs ready for cutting, samples of blocks—including one which could be worked on by four engravers at once—Mr. Rawlings proceeded to demonstrate his process, first of all coating a block with zinc white and one or two drops of egg albumen. This he rubbed in with the ball of the hand, remarking that it needed a great deal of practice, and should be worked from side to side or end to end. Having sensitised the block, he dried it over a spirit lamp, dissolved off the film with ether and alcohol, sensitised a second time, and again removed the film. He preferred magnesium to daylight for the exposure, alleging that he got a better depth of picture, using six and a half feet of magnesium at a distance of three to four inches for the negative he had with him. He thought six inches about the best distance, as if too close to the block the heat sometimes curved it. He showed some reversed negatives obtained by exposing through the glass, which were perfectly sharp. He fixed in a solution of hypo six ounces to twenty, and washed for about fifteen seconds by projecting a stream of water on to the surface of the block. He dried the negatives by removing moisture with the hand and applying heat in preference to alcohol. The photograph on wood could thus be produced under the hour.

Mr. A. L. HENDERSON asked the object of the second sensitising, and what was the difference between Mr. Rawlings' process and Crookes's? He (Mr. Henderson) had practised photography on wood for some years, and did not put any preliminary coating on the block, and yet the details were perfectly visible, and it could be cut very nicely. He also alluded to the collodion transfer process for the purpose, the film being transferred to the wood in alcohol, silver next to the wood.

Mr. RAWLINGS said he had tried Crookes's process and found it much too slow for practical purposes.

Mr. DAWSON said that in photography on wood subsequent alterations were sometimes found necessary. He asked for the experiences of those present on the point.

Mr. RAWLINGS said that by Mr. Henderson's process pencilling became difficult.

The CHAIRMAN said the surfaces of Mr. Rawlings' blocks could be pencilled freely; and Mr. CLARKE said they were the finest possible surfaces for pencilling.

Mr. DAWSON (continuing) said the subject brought before them by Mr. Rawlings that evening was of enormous interest. By his process, not only was expense saved, but valuable originals were preserved. Millais and other artists used to draw direct on the wood, and thus engravers would cut away most valuable copyrights. Mr. Rawlings' process was better than anything he (Mr. Dawson) had to do with personally. He had attended half a dozen lectures at South Kensington, and the information he had obtained was compressed within half a minute, and disappointed him. Mr. Rawlings had shown them that his process was practicable in the studio, and also for rough-and-ready purposes.

Mr. J. TRAILL TAYLOR said Mr. Rawlings' process was analogous to one formerly published by him in the *Photographic Times* of New York. This consisted, if he recollected aright, in coating the block with collodion containing nitrate of silver and nitrate of uranium. The latter reduced the silver nitrate. He had produced good results by the method, and to the satisfaction of a friend who was an engraver for *Harper's Magazine*. He (Mr. Taylor) afterwards began to think as to the utility of the collodion at all, and tried to simplify it to this extent. He took a little carbonate of lime in the form known as Spanish whiting, mixed some silver nitrate with it, and applied it to the wood. It gave a most sensitive surface and a brilliant image. He fixed by simple immersion in water. He did not carry it to any practical extent, but could recommend it very strongly.

Answering Mr. Henderson's question as to the object of the second sensitising, Mr. RAWLINGS said it gave double the rapidity. He had tried double the amount of silver in one coating, but two coatings with half the strength of silver gave a much better image.

Mr. CLIFT exhibited a wood block having a collodion transfer upon it; he said it could be pencilled upon, and the film need not interfere with the cutting.

Mr. H. W. BENNETT said that Mr. Rawlings' process was one of the most valuable he had seen. The objection to the collodion transfer process was that the collodion frequently peeled in very fine work, and it was impossible to see the fine shading in the detail. He had also found it difficult to pencil on. In Mr. Rawlings' process it was an improvement that they were able to pencil on the blocks, that it gave a white basis, and no film to speak of. He repeated that it was one of the most valuable processes he had seen.

In reply to a question,

Mr. RAWLINGS said he had not patented the process, and that anybody was welcome to work it.

Mr. HENDERSON suggested celluloid, with bone dust as a basis, as a substitute for the wood.

After some further discussion,

The CHAIRMAN moved a vote of thanks to Mr. Rawlings for his paper and demonstration, as well as for making the process free. He (the Chairman) had tried every process published. He had not succeeded with the transfer process, but did with a negative process, applying printer's ink to the block, sensitising with collodion emulsion, and taking a picture direct on to it. He got a fair negative, developing and fixing in the ordinary way. It was something like a ferrotype on the block.

A picture taken by Mr. Wellington with Dallmeyer's new teleo-objective was shown; also one taken from the same point with an ordinary lens.

Mr. Henderson exhibited some ink photographs by Mr. G. Pendry, of Nottingham, which that gentleman presented to the Association. Mr. Pendry having been thanked for the gift, the meeting closed.

Holborn Camera Club.—April 1, Fourth Annual General Meeting, Mr. T. O. Dear (Vice-president) in the chair.—The SECRETARY read the report of the Committee for the past year, in which they congratulated the members of the Club on the very successful year which had just ended. The social events had been excellently attended, while the lectures and demonstrations by various gentlemen had proved excellent. During the summer (!) months the outings proved very successful. The following places were visited: Waterlow Park, Pinner, Purfleet, Radlett, Broxbourne, Keston, and Hyde Park. The garden party in July was a notable success, and the week's sojourn to the Southern Counties' Cyclists' Camp at Dorking this year compared favourably with the past. The lantern shows had been numerous, and the report concluded with an expression of the regret of the Committee at the loss which the Club has sustained in the retirement of Mr. Smith, the late Hon. Secretary. The TREASURER read a statement of the income and expenditure of the Club for the year ending March 31, 1892, showing a nett balance of £15 16s. 2d. The reports having been adopted, various alterations in the rules were proceeded with. The subscription was raised to ten shillings and the entrance fee abolished. The Officers and Committee were then elected:—*President:* Mr. A. Horsley Hinton. *Vice-Presidents:* Messrs. Fred Brocas, S. T. Chang, E. Clifton, T. O. Dear, D. R. Lowe. *Committee:* Messrs. E. H. Bayston, A. T. Elsworth, A. J. Golding, A. Hodges, F. Knights, J. Stevens, H. West. *Hon. Treasurer:* Mr. Albert Bell. *Librarian:* Mr. J. Brittain. *Hon. Secretary:* Mr. F. J. Cobb. *Assistant Hon. Secretary:* Mr. Herbert Thompson. Ten members, on Saturday last, visited the Victoria Docks, and went on board *H.M.S. Grafton*, a new war-vessel which is being built in the docks. The Abbey Mills Main Drainage Works were also visited.

Polytechnic Photographic Society.—March 29, Mr. Quintin Hogg in the chair.—CAPTAIN GLADSTONE delivered a lecture on *Westminster Abbey* before an audience of about a thousand members and friends. The lecture was historical and architectural, and was illustrated by upwards of fifty lantern slides made by the lecturer from his own 12×10 negatives, the exposures for which had varied from two seconds to two days. The author conducted his audience round the Abbey, explaining the various historical and other events connected with each chapel and tomb in turn as the picture was thrown on the screen. The slides were remarkable for their detail, vigour, and softness, and full justice was done to such beautiful portions of the Abbey as Henry VIIth's Chapel and some of the Royal tombs.

Croydon Microscopical and Natural History Club (Photographic Section).—April 1, Mr. J. A. Carter, R.A., in the chair.—Mr. Baldock exhibited one of Chadwick's stereoscopes. Mr. A. J. E. HILL then demonstrated the *Cresco-Fylma Process for the Enlargement of Negatives and Transparencies without the Aid of Optical Appliances.* Ferrous oxalate and hydroquinone developed plates were recommended in preference to pyro-ammonia as being more easily manipulated. Some fine specimens in all stages of enlargement, from quarter-plate upwards, were exhibited, and apparently being free from distortion and loss of density whatever. The CHAIRMAN said that what he had seen that evening fulfilled everything that Mr. Hill had claimed for his process.

Bath Photographic Society.—March 30, Mr. Austin J. King (President) in the chair—The Chairman introduced the lecturer of the evening, Mr. E. J. Appleby, who read a paper on *Stereoscopic Photography*, and supplemented his remarks with a demonstration of printing transparent stereographs. Mr. APPLEBY pointed out that many were under the impression that the stereoscope was a recent development of the art, but in the fourth and fifth decade of the present century it was practised more than any other system; but so much had the work relapsed that hardly any mention was made of it in standard works published within recent times. The lecturer then described the conditions necessary to produce a picture which should appear solid when viewed in a good instrument (not necessarily an expensive one). He also spoke of the power which can be acquired by training the eye to see pictures of solid objects solid as in nature. By means of numerous examples the lecturer illustrated the necessity of correctly estimating the parallactic angle; thus, the moon would represent many thousands of miles, near objects the contrary. Defects in manipulation were pointed out, as well as faults distinctly traceable to imperfect stereoscopes. Messrs. Rose & Co., London, sent two new hand cameras for exhibition at the meeting. They were really double cameras, one used for securing the object on the sensitive film, the other portion intended as an exact guide to the work the instrument was performing. These were examined with great interest, and led to a discussion on detective camera work generally.

Bristol Camera Society.—April 1.—The subject of intensification of negatives drew a number of interested members, who thoroughly discussed the various methods of intensification by mercury, uranium, silver, redevelopment, &c. The discussion led to the admission that each process was the best under suitable circumstances, while for general use, when only one intensifier was desirable, mercury and ammonia is to be preferred.

Leith Amateur Photographic Association.—March 29, Mr. W. M. Smith (Vice-president occupied) the chair.—Mr. Alexander Pitkethly brought before the members the results of a somewhat exhaustive series of experiments he had been making with several of the newer developing agents. With para-amidophenol on gelatine plates of moderate rapidity, and with a good and sufficient exposure, he had found it to act in a very energetic way, giving a negative very clear, free from stains or yellowing, which although thin was full of detail in the most shadowed portions. Samples were passed round, and his judgment generally verified. He also showed a number of bromide prints and lantern slides, which were much admired, the developer being rodinal, which, for this class of work, clearly showed its advantages and disadvantages.

Liverpool Amateur Photographic Association.—March 31, the President (Mr. W. Tomkinson) in the chair.—Three new members were elected. Mr. E. M. Tunstall introduced the subject of *The Lantern Mission: What it is, and what it may become.* In a few words the speaker referred to the history of the movement, which was already supported by some of the best photographic workers, and pointed out the advantages that were to be derived by members of such an organization, as well as the beneficial work which they might do for others at the same time. The next subject was the discussion of two alternative schemes for new club-rooms. A copy of the plans was in the hands of each member (having been prepared free of cost by two of the members), and after full discussion it was unanimously decided to adopt the

scheme recommended by the Council, provided the premises could be obtained on satisfactory terms. Mr. Fred Anyon then gave a lecture on *Art in Relation to Photography*, illustrated by lantern slides. The lecturer first emphasised the distinction between taking a photograph and making a picture, pointing out the general rules of composition, and showing how far they might be applied to photography, and then proceeded to illustrate his meaning by throwing upon the screen photographs of the same scene taken from an artistic and an inartistic point of view. Many of the pictures were Mr. Anyon's own work, and proved him to be well qualified to give advice upon the subject he had in hand. The lecture was listened to with close attention by a large audience.

Midland Camera Club.—April 1, Dr. Hall Edwards in the chair.—Mr. Walter D. Welford gave a paper upon *Hand Cameras: their Construction and Use*. Dealing first with the want of success so often heard of, he explained that a hand camera required more experience and practice than an ordinary stand camera. Next followed an attack upon the word "detective," and the abuse of indiscriminate shooting off. Lenses and shutters being disposed of, the various cameras in the market were dealt with in the following order: Box cameras, bag changers, well system, groove reservoir, lever movements, and reflector principles. The following were amongst those shown: Griffiths' Two Guinea, Ashford's, the Talmer, the Cytox, the Alert, the Ideal, Crouch's, the Artist Twin Lens, and the "Itakit." The latter, which is of metal, very simple in construction, and carrying twenty-four plates, was shown by Mr. W. J. Spurrier. Mr. Welford next dealt with the position in which to hold the camera, and urged every user to thoroughly study the mechanism at home first. He concluded with advice as to street scenes, and a strong appeal to members to utilise all opportunities in that direction. In addition to the cameras, a series of negatives taken last week were shown, and at the end of the paper some 200 slides were exhibited.

South Manchester Photographic Society.—The first meeting of the newly formed South Manchester Photographic and Lantern Society was held on Monday, at the Longford Lecture Hall, Stretford. Mr. W. I. Chadwick, the Chairman, stated the object and scope of the Society. There were other societies in Manchester, and it was not intended to compete with any of these. There were a considerable number of amateurs living on the south side of the city who preferred a meeting place nearer home, and it was not intended to extend the membership to an unlimited extent, as smaller societies have oftener proved to meet the object more efficiently. Another great inducement in favour of Stretford was the magnificent accommodation afforded by the rooms, with conveniences such as few photographic societies in the world can boast of. They have been generously placed at the disposal of the Society by Mrs. Rylands. The meetings will take place monthly, with technical or instruction meetings and popular or exhibition meetings alternately, and to the latter members may invite friends. There will be outdoor meetings during the summer months. The management of the affairs of the Society is vested in the hands of the officers and members present at the monthly meetings. Thus every member has an equal voice and vote as regards the interests of the Society. A library has been started, and an enlarging apparatus of the most perfect kind has been presented to the Society for the use of members at their own homes; and, if the support is accorded to the Society which is hoped for, there are other possibilities in the near future. The annual subscription has been fixed at ten shillings, but for members joining after the February meeting the subscription will be five shillings for the first half-year. The Hon. Secretary, Mr. M. W. Thompstone, Beaufort House, Brocklands, will supply any further information to inquirers. Mr. Chadwick afterwards showed a large number of photographs made from negatives taken by himself during the past year. He took the members through some of the finest scenery that we have in England, including scenes in the Isle of Man, Isle of Wight, Windsor Castle, Dovedale, Chatsworth, Hadden Hall, Cheshire, concluding with some very beautiful views of the Museum at Peel Park.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

"PHOTOGRAPHIC PORTRAITS."

To the EDITOR.

SIR,—Not long ago a wordy warfare raged in the photographic press between the admirers of the older system of pictorial photography and a small number of others whose leanings were towards a style which differed in character in some respects. Possibly at times the disputants became rather heated, but, on the whole, there was little which could be called absolutely objectionable.

Recently I have noticed in your columns some communications on the subject of the rival systems, which, although, in my opinion, based on erroneous ideas, and sometimes perhaps rather humorous than serious, call at present for no direct comment. A paper, however, called the *Optician*, has lately reached the Camera Club, and an article therein has been pointed out to me which, I think, should not pass altogether unnoticed. The article is entitled "Photographic Portraits," or some such title, if I remember rightly. I do not propose to enter into any discussion concerning the misrepresentations which it contains relating to a phase of photography which some of us take pleasure in practising. It is rather to the tone of the article that I wish to refer, in the hope that some restraint may be placed on a system of comment which is not infrequent, though rarely of such an unsavoury character as in the present instance.

It is difficult to believe that the editor of the journal in question can have been aware of the nature of the paper which he has allowed to appear in his columns, for it is inconceivable that any respectable journal should consent to publish such gross and vulgar personalities. The references to Mr. George Davison and Mr. Gambier Bolton (there is no necessity to mince matters or affect ignorance), are in as bad taste, to say the least of it, as they are uncalled for. Happily, both these gentlemen can well afford to treat them with the contempt which they deserve, and I need not further refer to a subject which becomes the more unpalatable the more it is considered, except to express a hope that this, being entitled No. 1 of a series, the editor of the *Optician* will have the good feeling to allow it to be the last.

But on the general question of the attacks made on those who practise a system of pictorial photography which happens to have some original features, may I ask, Why this virulence, why this intemperate denunciation? Do our exhibitions or galleries teem with this class of work? Is there danger that it should oust all earlier and more popular methods? How many are there who practise it? Sir, I challenge the writers of the articles to which I refer to name ten; in fact, I challenge them to name five photographers who adopt this system. If there are more, I should be happy to know it; but, if so few, why is it necessary so frequently to unmask this battery of delicate sarcasm, to bring to bear such ponderous artillery against, at most, half a dozen men who endeavour to please themselves and others in a somewhat unconventional manner? Can they not be left alone? Is their influence so much to be dreaded? So much attention, surely, might have a smack of flattery about it, if flattery of the kind could be acceptable to those to whom it is addressed.

It is not uninstructive to note that the opposition to the class of work to which I allude comes almost solely from photographers. The general public does not appear to be by any means so antagonistic. Now, from the point of view of scientific photography, I do not blame these objectors. But why, again, this virulence? I have, I am happy to say, more than one friend who is wholly scientific in photography, and they tell me candidly that they do not like, for instance, my own pictures. Well, we agree to differ, and we do not necessarily retort upon each other with coarse and strong language. So, with regard to these photographers, if their method is worthless, why not let it meet the certain death to which, on this account, it would necessarily be destined? If, on the other hand, it has value in it, surely its advocates might be allowed to give pleasure to those who could derive pleasure from it.—I am, yours, &c.,

London, April 5, 1892. ALFRED MASKELL.

STEREOSCOPIC PHOTOGRAPHY.

To the EDITOR.

SIR,—Upon looking over my article in last week's copy of this JOURNAL, I can imagine a misunderstanding might arise from the last paragraph, and some further remarks are necessary.

Near the centre of the retina of the human eye is a "yellow spot." When the image of a distinct object falls upon the centre of this yellow spot, a distinct impression is formed in the brain, and we see distinctly; but, when an image falls upon other parts of the retina, it is conveyed to the brain in a less distinct manner, that is to say, all other parts of the retina radiating from the "yellow spot" are less sensitive, and the mind receives images from these parts in what a photographer would call out of focus. When we want to see an object, we turn our eyes in the direction of that object, and thus bring the image formed by the crystalline lens into the centre of the yellow spot, for, as has already been said, this is the only place where distinct vision is possible. It is therefore manifest that we can only see a point of an object distinctly at a time, and all other parts of the object are indistinct, or out of focus; but, by experience from very early infancy, we associate these indistinct images in a certain way, and we know what they mean. For instance, when we have learned to read by a momentary glance at a word of eight or ten letters, we know what these letters mean. If we look at the initial letter in the word "stereoscopic" first with one eye, we concentrate our attention for the time on the letter "s," and we see it, or part of it, distinctly, and the other letters will be more or less indistinct, though by practice in reading we know instantly what they mean. If, now, we look at the letter "s" with *two* eyes, each retina will receive a similar image in a similar way, and by experience the two images are combined in the brain, and we know we have only one object before us, but depending upon the distance the object be from the observer, the indistinct images (alike in both eyes) will fall upon different parts of the retina which are more or less sensitive, and by experience again we know we are looking at a flat object.

But, when we look at an object of three dimensions with two eyes (the object may be something near at hand, or it may be a landscape) we converge the optic axis to some particular point so as to bring it upon the centre of the "yellow spot" of the retina. Now, it will be seen that all other objects around the particular point are not only indistinct, but they are *not alike*, in each retina, for with one eye we see more of one side of the solid object than is visible to the other eye, and these indistinct

images which are not alike do not correspond in the same way; they would if the object was flat, and by experience and association with other mental faculties we know them to be solid. When we look at a near object, the convergence of the optic axis is greater than when a more distant object is observed, and the dissimilarity of the indistinct images is more pronounced.—I am, yours, &c., W. I. CHADWICK.

Manchester, April 6, 1892.

RATIO OF GRADATION.

To the EDITOR.

SIR,—In your issue of the 25th inst., "Free Lance" asks me a question which I have already answered in the previous number of the JOURNAL. I will, however, answer it once more. The experiments of Messrs. Hurter & Driffield show that the gradations of a negative are "almost identically the same whatever developer be employed." But "there is a theoretical possibility that a plate may be rapid to one developer and slow to another."

It is therefore true that beyond a trifling limit the photographer has (according to Messrs. Hurter & Driffield) no means at his disposal for altering the gradation; but we cannot say that he never will have such means at his disposal. The difference with eikonogen is altogether inconspicuous and of no avail for practical purposes, as far as the recorded experiments go. The diagram No. 14 clearly proves this.

Now, "Free Lance" says the gradation can be changed at will. Beyond this insignificant difference? If so, let him do it; if not, why juggle with the question? There is nothing whatever absurd in my challenge; we have had quite enough of people who, in their easy-chairs languidly beg to differ from Messrs. Hurter & Driffield, find all manner of faults with their instruments and their conclusions, and, having said everything (but done nothing) to damn their work, end by expressing the greatest admiration for these able investigators. I imagine that Messrs. Hurter & Driffield care little for such praise, and that my simple statement "they have laid the foundation for a quantitative science of photography," will sound sweeter in their ears than all that has yet been said or written about them.

"Free Lance" seems in doubt whether I was guilty of rudeness to him, or of throwing "surreptitious mud" (whatever that may be composed of) at Messrs. Hurter & Driffield. I told him he was unnecessarily discourteous to them; when he cries *peccavi* I shall be happy to stand him coffee and cigars. Mr. Bolton's experiments are highly interesting; I shall try to learn more about them and their significance.—I am, yours, &c., R. C. PHILLIPS.

Arts Club, Manchester, March 28, 1892.

FOCUSSING EYEPIECES.

To the EDITOR.

SIR,—Your article in this week's JOURNAL upon "the use of focussing eyepieces," brings before photographers such a time-saving system of focussing, that I am sure none who have tried it will ever give it up.

With your permission I will explain a little dodge in connexion with the use of eyepieces, that very much increases the delicacy of the image formed.

Having carefully adjusted and fixed the focus of the Ramsden or other eyepiece, procure five circular glass microscopic slide covers (½ inch is a convenient size), and cement them with Canada balsam on to the ground side of the camera screen, one in the centre, and the others round it about two-thirds of the distance from the centre to the corners.

The position of the view or figure can be arranged, as usual, upon the screen, which will, however, now appear to have five round holes cut through it, the Canada balsam having entirely removed all trace of "ground glass."

To adjust the focus, apply the eyepiece to the "holes," and for all practical purposes the result is a telescope, every detail will be seen with a crispness and delicacy that makes one wonder however we have previously managed to focus upon the rough surface of ground glass.

If makers would take the hint and supply the ground screen with five small polished surfaces, they would recoup themselves the extra cost by the additional number of eyepieces they would sell.

I do not claim any originality in this "dodge." It was given to me by Mr. W. Baynes, of the Torquay Photographic Society, and I have so appreciated its advantages, that I think others might be glad to hear of it.—I am, yours, &c., EDWARD J. SMITH.

Park Royd, Halifax, April 4, 1892.

PHOTOGRAPHING IN ROME.

To the EDITOR.

SIR,—In answer to G. J. J., I can say that I photographed in Rome, and have no difficulty, nor required any permit for *outside views*. For interiors a permit is required for about every building, church, palace, &c., but easily obtained from archbishops, princes, dukes, generals, &c., in charge, by calling or writing. Details for each are obtained from janitors, and a pourboire will go far to easy matters. Of Naples I do not know, but suppose it is the same as in all Italy.—I am, yours, &c., ALBERT LEVY.

Asnières, March 28, 1892.

BLACKPOOL AND NORTH-WEST LANCASHIRE ART, TRADE, AND INDUSTRIAL EXHIBITION, MAY 4 TO 28, 1892.

To the EDITOR.

SIR,—I beg to inform you that at a largely attended meeting of the Art Committee of the above Exhibition, held on Monday last, it was decided to have a section for artistic photography. This Art Exhibition, which has been held for several years, is a very successful one, and it is hoped that this decision, to include photographic art, will be appreciated.—I am, yours, &c., JOHN R. HUDDLESTONE, *Secretary.*

Winter-gardens, Blackpool, April 4, 1892.

PRINTING UNDER RED GLASS.

To the EDITOR.

SIR,—I believe it has been stated as a fact that printing under "green" glass tends to increase *contrast* in the print. Would the use of *red* or ruby glass (in place of the green) reduce contrast?—I am, yours, &c., R. MATHER.

March 30, 1892.

[It would not only "reduce contrast," but also the probability of obtaining a print at all if the glass be of the usual non-actinic kind.—ED.]

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.—A CORRECTION.

To the EDITOR.

SIR,—Permit me to correct an error I made in reporting Mr. Beadle's demonstration before this Society. I described it as *Enlarging by Artificial Light with the Use of a Lantern.* It ought to have been "*Without* the Use of a Lantern." Thanking you in anticipation.—I am, yours, &c. J. MCINTOSH, *Hon. Sec.*

14, *Lowman-road, Holloway, April* 4, 1892.

THE WOODBURYGRAVURE PROCESS.

To the EDITOR.

SIR,—We notice a reply to James E. Gould, in your issue of April 1, to the effect that the Woodburygravure process is not patented. We therefore beg to inform you that this is an error; the process is duly patented, the specification number of which is 2211 of 1891. Perhaps you will be good enough to correct this in your next issue, and much oblige.—Yours, &c.,

WOODBURY PERMANENT PHOTOGRAPHIC PRINTING COMPANY (Eyre & Spottiswoode).

6, *Great New-street, London, E.C., April* 5, 1892.

[The "Woodbury Gravure" process to which we and our correspondent referred is not that which forms the subject of a patent.—ED.]

Exchange Column.

**** No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Vogel's 12×10 triplet offered in exchange for good rectilinear wide-angle whole-plate lens.—Address, WILLIAM KIRK, Cowes.

Exchange 10×8 Kinnear camera, brass bound, double and single slides, for detective camera, or 12×10 rapid rectilinear.—Address, C., 11, Waterloo-crescent, Dover.

Wanted, Adams' Ideal hand camera in exchange for a first-rate whole-plate camera, with three double backs and solid leather case, scarcely used.—Address, A. E. SMITH, 56, Schubert-road, Putney, S.W.

THE BRITISH JOURNAL OF PHOTOGRAPHY, from 1879 to present date, cloth bound, BRITISH JOURNAL PHOTOGRAPHIC ALMANACS, same years, library bound, two *Photographic News*, half calf, all new condition; wanted, photographic apparatus.—Address, G. FEVER, Sunnyside, Endsleigh-road, Ealing Dean.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

H. Cooper, Northampton.—*Two Photographs of Ben Tillet.*

J. R. Jones, Crewe.—*Two Photographs of the Cheshire Beagles.*

A. P. Reid, Belfast.—*Photograph of Design of a Revolving Photographic Showcase.*

H. J. CHANNON.—Received.

REX.—The defect is due to the faulty lighting of the picture.

AJAX.—Old negatives are of little or no commercial value for their glass.

L. E.—You will find an article on the subject in another part of the JOURNAL.

W. W. W.—If you dissolve the bitumen in highly rectified benzol, your difficulty will disappear.

S. PRINCE.—Your developer is too strong in alkali in proportion to the pyro, hence your difficulty in securing density.

P. K.—Unless we knew the nature of your process, it would be impossible for us to advise as to whether it could be safely patented or not.

F. J. QUICK.—The lens would answer the purpose so long as you employed the centre of the plate only. We should advise you to procure a lens of the rapid rectilinear type.

SHUTTER.—You have evidently been over-exposing, omitting perhaps to notice that the actinic value of the light has increased enormously duringthe last week or ten days.

M. S. says: "Should be pleased if you will tell me if there is a book of photographic poses published by any firm?"—Perhaps some of our readers can furnish the desired information.

SILVER BATH.—The bath should be slightly acid; if carefully decanted, the solution will not require daily filtration. Better test the strength of the solution every day before use with the argentometer.

T. B. J.—Your burnt-in pictures are very promising, that is all that can be said for them. Much better work is being produced, a fact of which, we surmise, you are not cognisant, from the tone of your communication.

H. B.—You are already in possession of the quickest form of lens except the portrait combination of Petzval. Although this would be a more rapid instrument, we doubt if it would answer your purpose so well as what you have.

C. A. J.—It is quite against our rule to recommend any particular manufacturer's goods. There are many hand cameras now in the market, all of which are good. Send to the different makers for their prospectuses, or, better, call and see the instruments themselves.

LANCS.—Usually when new machines have to be photographed, and the best results are imperative, they are painted over with a "flat" colour of a grey tint—simply colour mixed with turpentine. This can be easily cleaned off with that solvent after the negatives have been secured.

WORCESTERSHIRE.—We cannot understand your difficulty. You must have an extraordinary kind of bitumen if it will not dissolve in benzol. We can only suggest that you obtain another sample from a fresh source, and, if that behaves the same, then change the solvent, for that must be at fault.

R. PARKER.—The orthographic lens, like the single landscape lens, will yield straight lines in the centre of the picture, but not at the margin. Hence it is not a good copying lens unless used for small plates, as compared with its focal length. For landscape purposes, or for groups out of doors, it is an excellent instrument. The price asked for it is certainly low.

RESIN.—Had you compounded the varnish according to the formula given, you would have had a good protective for your negatives. We are not at all surprised, with the large proportion of Venice turpentine you have introduced, that the "negatives become very tacky when printed in the sun." The only way out of the difficulty is to throw away the varnish and make fresh.

1870.—There is nothing novel in a silver print being as good as when it was first produced after twenty-two years' keeping. At the Photographic Society of Great Britain's rooms there are prints on view that are nearly forty years old which are still good, and show no signs of fading, although the probability is that they were produced under what would now appear to be very adverse conditions as regards permanence.

M. J. JACONS.—The best form of battery for depositing copper on a large scale, in photogravure, is either the Daniele or the Smee. The latter we prefer ourselves on account of its cleanliness, though the former is the more constant. For working on a large scale a dynamo machine is now generally employed. A machine absorbing two or three horse-power will do a large amount of work, and very economically too.

A. C. H. writes: "I am desirous of enlarging a small photograph to about thirty inches on plain matt paper for subsequent pastel work, for which the bromide papers are unsuitable. Will you please give me the formulæ for preparing, sensitising, developing, and fixing same?"—At pages 450, 483, and 487 of our volume for 1890 you will find three articles dealing most exhaustively with the subject. The pictures, however, are printed out in the frame, not developed.

STUDENT.—Yes; Dr. Jeserich's paper is published in full by the Photographic Society, but no particulars of the process he employs are given in it.

C. ALSTON inquires how he can obtain a thick film of collodion so that when it is stripped from the glass it will be about the thickness of a thin visiting card. He says he has made the collodion as thick as it can be made to flow over the glass, but even then the dried film is much too thin for his purpose.—The best method is, after the glass has been French-chalked, to surround the edges of the plate with strips of paper cemented on with gum. Then place the glass on a levelled stand, and pour on the collodion in sufficient quantity to give the desired thickness when dry.

D. BENNALL writes: "I have a batch of sensitive paper which I cannot succeed in toning, or only to a dirty red colour, and then only after a very long time. There is no fault with the bath, as another sample of paper tones readily enough in it. When the print is taken from the negative, it looks very nice indeed, quite equal to one on the paper that tones so easily. Can you suggest any means by which I can overcome the difficulty, as I have a pretty good quantity of the paper by me, which I should prefer using up to throwing away? I may say that, on putting a piece of test paper in the washing water, it was made very red instantaneously."—We recommend our correspondent to try immersing the prints, after the free silver is washed out, in a very dilute solution of washing soda for a minute or two, and then rinsing them prior to toning.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.—April 11, *Rural Rambles*, a Lantern Evening by Mr. J. Gale.

THE LANTERN SOCIETY.—April 11, Mr. E. W. Maunder, F.R.A.S., on *The Work of the Spectroscope as Applied to Astronomy.*

THE PHOTOGRAPHIC CLUB.—April 13, *The Choice of Lenses*, Mr. J. Traill Taylor. 20, *Masking, Vignetting, and Printing-in Clouds.* Bank Holiday outing (April 18), Godalming, Witley, &c.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Ordinary Meeting, April 12, at eight p.m. Professor C. V. Boys, F.R.S., on *Photography of Flying Bullets:* Mr. W. E. Debenham on *Relative Exposures for Varying Proportions of Image in Copying.*

THE West Surrey Photographic Society's Fourth Annual Exhibition was held last week. Several of Messrs. J. Gale's and George Davison's works were on view, and these, in conjunction with the members' exhibits, provided an excellent display.

MR. A. C. JONES has entered into partnership with Mr. Samuel J. Levi, son of the late Mr. Joseph Levi, and they will carry on, at 71, Farringdon-road, and 16, Woodbridge-street, E.C., the business of wholesale opticians, and manufacturers of, and dealers in, photographic apparatus.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—April 14, *Convention Slides*, Messrs. Cembrano and Hastings. 21, Dr. Jeserich's paper on *Photography and Crime*, illustrated by slides, and *Indian and Colonial Slides.* 28, *The New Platinotype Paper*, Mr. W. H. Smith.

A NEW SOCIETY FOR THE ISLE OF WIGHT.—At a meeting held in the Town Hall, Ryde, recently, it was decided to start an Isle of Wight Amateur Photographic Association. A further meeting, to fix the subscription, is to be held. Mr. W. W. Smee, of 27, Union-street, Ryde, is the Hon. Secretary.

WE have received the annual report of the Liverpool Amateur Photographic Association, which is an excellent tribute to the continued prosperity of the Association. Accompanying the report are plans of some projected new premises which the Association is discussing the question of occupying.

A CORRESPONDENT writes: "I had my hands dreadfully stained with nitrate of silver, and during the same day, whilst working with hydroquinone and soda developer, I was much surprised to notice that my hands became pure white again. This might be a useful hint for the much-oppressed wet-plate worker."

WE recently had an opportunity of inspecting the premises of Messrs. Houghton & Son, of High Holborn, which have undergone considerable alteration and rearrangement in order to fit them for the reception of a large stock of modern photographic apparatus. Messrs. Houghton have transformed their old establishment into a most admirable depôt for the sale of the innumerable requisites demanded in photography to-day, our inspection convincing us that the firm is no way behind its competitors in enterprise and facilities for coping with whatever demands are made upon it.

*** GOOD FRIDAY.—*Will our contributors and correspondents please note that, in consequence of Good Friday falling next week, we shall go to press one day earlier than usual?*

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1667. Vol. XXXIX.—APRIL 15, 1892.

ON SPOTTING.

This really very important part of a photographer's work is commonly considered of such minor consequence as usually to be ignored in treatises, occasional papers, and by the authorities generally; but a very cursory inspection of the multitude of prints distributed by amateur or professional will suffice to prove that either ignorance or carelessness governs the treatment in this respect of a large number of these photographs, and we propose to discuss in a short article some of the modes where failure may arise. It may be assumed that the professional artist may not need any hints, and usually does not, but we have seen instances where the contrary decidedly appears to obtain.

The consideration of the subject naturally divides itself into two branches—treatment of the negative and of the print. Looking first at the negative and its requirements, some individuals, fortunate in their experience, may say that with dry plates there should be no spots to treat; but this is only theoretically true. Plates are not all perfect, to start with, and they receive injuries and meet with mishaps that mar the beauty of result if not modified, and in any case suggest slovenly work. The commonest evil is the pinhole caused by air-bubbles, dust, or opaque specks in the film. And it is with them where mistakes are often made. In looking through a negative it is rare to find no pinholes; but we would here again remind our readers that many such markings need no treatment at all, and work is often most unnecessarily made for the spotter. A bright spot on a dark ground, by reason of irradiation, always appears to the eye larger than it really is, and, conversely, a dark spot on a light ground looks smaller than its actual size. Hence a pinhole quite conspicuous in size may often be left entirely alone, and be practically invisible in the print. A little experience, when observation has once been directed to the point, will soon enable any one to gauge whether the brush should or should not be applied.

Supposing it be decided to remove it, care should be taken not to let the paint in the slightest degree encroach upon the surrounding parts, or the visible mischief will be worse than ever, and great labour needed afterwards. For this kind of defect water colour is generally employed, crimson lake being a favourite with some, while others use browns or Indian ink. The advantage of the latter is its great covering power, and the fact that it will "bite" well and a half-dry brush can be employed with advantage. When larger spaces have to be covered, the usual mode of retouching is best—pencil or otherwise. We may say that the advantages of Indian ink are not thoroughly appreciated, for, if the brush has little colour in it, it can be laid on as quickly as pencil, and with greater covering power when a considerable depth of tone has to be produced. One caution is necessary, however: neither the brush nor pigment must be moistened with the saliva; if this be done, the colour clots, and will not lie evenly upon the plate. It is most desirable, in all cases, to prevent the colour from trenching upon the external margins.

Whether large spots should be taken out of the negative, so as to be as nearly invisible as possible, or blocked out entirely to print white, depends upon whether many copies are required or not. As a rule, a white spot in a print can be worked up with the brush much more quickly than the same space can be "matched" on the negative; hence, when one print only is needed, it may often be best to paint the spot opaque on the negative and do the spotting on the paper. The ease with which this is to be done depends upon the situation. Where foliage or other irregular shadings surround it, a very few touches suffice; but when the flaw comes in a flat, even surface, such as the walls, &c., in an interior, or the plain background of a portrait, far greater skill and attention is required, and no easy work attends the operation. Flaws often occur through mechanical irregularities in the film, and where this is the case it is found most difficult, and indeed often impossible, to make the colour adhere. A little projection or depression will obstinately refuse to receive any amelioration, and a spot apparently removed turns out, upon a print being obtained, to be almost worse than before it was touched. When the pigment becomes thoroughly dry, it often cracks or withdraws itself from the place. In this case there is no remedy but either to lay on a thick clot of paint (which sometimes even then fails) or to cut out the offending place with a sharp knife, and fill in the colour on the bare glass.

There is one especial point we would draw attention to. There is no doubt that nowadays a large amount of alteration of a sitter's figure or habiliments is carried out in portraiture, and to do this there is a right and a wrong way. The right way is to do the work entirely, or as near as can be, on the negative, leaving nothing for the after-spotting. The wrong way is to block out the offending part so as to print white, and then to stipple it on the print into the correct shade. The great objection to this plan is that a knowing friend may mischievously moisten his pocket-handkerchief and remove the spotting with one sweep, ruthlessly revealing the spotter's art. We have known this to be done in private albums, hence *verbum sap.* We have not exhausted our subject, and will return to it shortly.

DEVELOPMENT OF CHLORIDE EMULSION PRINTING-OUT PAPERS.

Some months ago, in a Continental Note, we quoted the recommendation of a writer in a French contemporary to obviate one of the troubles met with in printing out on the various gelatine

and collodion chloride papers, now in such general use. This was the length of time often required to obtain vigorously printed proofs, owing to the comparative weakness of the light at the time of printing. The method quoted for overcoming this drawback was to develop the faintly printed image with a solution of gallic acid in alcohol. It was said that development took place rapidly, all the fine details of the negative being reproduced.

It is quite obvious that, if the system of development above advocated—which, by the way, as we pointed out at the time, is not new in its application—were proved to have all the virtues claimed for it, the advantages of its use would not be restricted to those cases where proofs on these emulsion papers were, through lack of light or insufficiency of time, obtained in a feeble degree, but also, on the other hand, would be very welcome to a photographer who, notwithstanding the excellence of his light for printing-out purposes, might, if he were anxious to obtain a large number of collodio or gelatino-chloride prints from a given negative in a short space of time, prefer to strike weakly printed proofs from them while he had the opportunity, with the object of finishing them by development at a later hour, rather than jeopardise the chance of obtaining prints at all on that particular day. There is, in addition to these two considerations, a further one at stake, namely, the fact that it is claimed for developed prints that the chances of their permanency are greater than pictures simply printed out in the frame. This we can easily appreciate, inasmuch as the system of reduction by development is calculated to throw down the deposit in a more stable form than in the case of printing out.

Experiments made with gallic acid, in combination with acetic or citric acids, as a developer for weakly printed gelatino-chloride proofs did not, we believe, terminate so successfully as to indicate that the method was of any practical use; but the attention of the well-known experimentalist, Herr Valenta, has been turned to the matter, with results which we reproduce in another part of the JOURNAL. Here he recites the advantages which reside in the power to develop these weakly printed images at will, and also summarises some of the previous experiments with gallic acid and other substances, all of which, however, proved ineffective and unreliable. Alkaline developers also being, even in a high degree of dilution, far too energetic in their action over the unreduced parts of the pictures, were abandoned by him in his attempts.

The failure of alkaline solutions, however, led him to experiment with acid developers for the purpose, an experience with a hydroquinone-silver intensifier for collodion plates leading to the discovery that hydroquinone simply in combination with citric acid was capable of acting as a developer for weak prints on emulsion papers. With the addition of sulphite of soda this gave rise to the following formula for "developing insufficiently printed proofs on celloidin and aristo papers":—

A.—Hydroquinone	10	parts.
Alcohol	100	„
B.—Sulphite of soda	100	„
Citric acid	5	„
Water	500	„

Fifty parts of each being mixed and diluted with 1000 parts of water, and being then ready for use.

After development in this solution, which takes place in a few minutes, the prints are washed, toned, and fixed as usual. Further experiments led Herr Valenta to substitute pyrogallic for the hydroquinone when developing the images on certain papers, for which hydroquinone was unsuitable. In the various commercial papers with which he experimented, we assume that gelatine as well as collodion figures as the vehicle of the emulsion, although it is not so stated. The citric acid in the developer acts as a restrainer, and keeps the prints clear.

It is a fact of considerable value, we should think, that feeble prints on emulsion papers are amenable to development without degradation of the whites of the pictures, and with, as we also gather, no danger of any loss of tone or vigour of image. Herr Valenta's discovery that alkaline developers for the purpose are useless, but that an acid solution forms an efficient substitute is a feature of considerable practical use, which, we presume, will speedily be taken advantage of by those who are anxious to have the power of developing weak images on emulsion papers at command. We should not be surprised if their development at will did not add to the popularity of these surfaces.

Encaustic Paste.—At one time it was thought that treating the surface of silver prints with "encaustic paste" conduced to their permanence. Now encaustic paste is practically the old-fashioned "beeswax and turpentine," with which our grandmothers were wont to treat their furniture to obtain the high polish thereon. It was considered that the thin coating of wax, by resisting damp and protecting the surface from the atmosphere, would render the prints more stable. It would be interesting to know if any of the old prints recently shown at the Society's rooms owe anything to encaustic paste?

The Maddox Fund.—As we have already announced, this Fund closed on March 31. The total amount subscribed in this country is about 400*l.*, and we believe the sums received in America as well as from the Continent will swell the ultimate total to between 500*l.* and 600*l.* It has been decided by the English Committee that the sum received by Mr. Francis Cobb, the Hon. Treasurer, shall be handed over to the Doctor with a brief address stating that "the testimonial is presented to him in recognition of his services to photography, and especially of his investigations in connexion with gelatine emulsion."

Unhealthy Atmosphere.—One frequently hears complaints of the unhealthy fumes of the dark room, but evidently in the minds of some there are worse elsewhere. One day last week a photographic operator was to have attended for public examination at the London Bankruptcy Court, but did not. According to an evening contemporary, the reason assigned was "that his health would not admit of his inhaling the noxious atmosphere of the Court of Bankruptcy.' If the atmosphere of the Bankruptcy Court is worse than that of some dark rooms in which operators have to work, it must be bad indeed. Moral, avoid bankruptcy.

Register of Dark Slides.—Questions are often put as to the best way to test the register of dark slides with the focussing screen. By the following simple method, which does not appear to be so generally known as it might be, the accuracy may be tested with the greatest certainty. Place a straight-edge across the focussing screen, then pass a piece of wedge-shaped cardboard between the straight-edge and the ground glass, and mark where it touches the former. Next place a plate in the slide, draw the shutter, and repeat the operation. If the cardboard touches the straight-edge in the same point as it did with the focussing screen, the accuracy is assured. If it does not, the amount of adjustment necessary is easily measured.

Substitute for Gelatine.—Mr. R. A. Fressenden calls attention to a discovery of Messrs. Cross & Bevan (whose names

are familiar in connexion with the primuline process of photography) which indicates a mode of preparing a substance which "strongly resembles gelatine in appearance, flexibility, and odour when burnt, and might, on account of its solubility in ammonia, be of use for photographic plates." They formed this new substance by treating cellulose with dilute nitric acid, thus forming oxycellulose. This substance is soluble, on digestion, in ammonia, and on evaporating the solution a transparent film is left, which, by its odour when burnt, seems to be a nitrogen compound of cellulose. We are not aware of any use having been made of this discovery in photographic directions, but upon a first glance there would really seem to be a valuable field for it if all that is described be correct, and there be no special difficulty connected with its manufacture.

Photographing the Boat Race.—Seldom, if ever, have photographers had such an opportunity for securing really good pictures of the boat race as they were favoured with last Saturday. The weather was charming, while the light was all that could be desired. Never before were so many hand cameras to be seen amongst the crowd who lined the banks of the river last week. Perhaps no two university crews have been so much photographed as have the present ones, for during the whole time they were practising hand cameras seemed to be constantly on the spot. Persons taking hand cameras into crowds should be particular how they carry them. We were told of an amusing circumstance that occurred at the boat race last year. A gentleman took with him a hand camera with cut films, which, when not in use, was slung by a strap at the side. On returning home, he was surprised to find that the index registered about three times the exposures he had made. He then discovered that some practical jokers in the crowd had been manipulating the instrument without his knowledge. This might easily be done without detection in any crowd, particularly a moving one.

Reduction of Patent Fees.—In introducing the Budget on Monday evening last, the Chancellor of the Exchequer said: "My right hon. friend the President of the Board of Trade has informed the House of his wish to see the heavy charges for the renewal of patents reduced in the interest of the poorer patentee, and for the further development of inventions. Small as my margin is, this is a reform which the Government do not wish to delay, and which they think they can afford. The primary fee of 4*l.* now charged for the first four years will remain, but from the end of the fourth year onwards large reductions will take place. At present the fee for the next four years is 10*l.* a year; this will be reduced to 5*l.*, 6*l.*, 7*l.*, and 8*l.* For the fifth and sixth year the present fee is 15*l.* a year; this will be put at 9*l.* and 10*l.* For the next four years, instead of a charge of 20*l.* per annum, the fees will be 11*l.*, 12*l.*, 13*l.*, and 14*l.* These reductions, which, I believe, will be received with extreme satisfaction by a very large class, will ultimately involve a loss of about 50,000*l.* a year, but we should not ask that the new scale should come into operation before September 24."

Swollen Apparatus.—Just now apparatus that has been stored away through the winter months is being brought to light again. It is often found, if it has been kept in only a slightly damp place, that the wood has swollen sufficiently to materially interfere with the free movement of the sliding portions. Shutters of slides for instance, are difficult to withdraw, and other working parts are hard to move. Especially is this the case with some of the cheaper forms of apparatus, which, as a rule, are made of imperfectly seasoned material. Frequently, when this trouble is met with, recourse is had to a piece of glass or to glass paper to scrape away the wood, until the part works easily. This is a great mistake, as it often proves a source of future trouble; because, when the wood shrinks again, as it will do, it no longer fits. We recently saw some dark slides, the shutters of which had been subjected to this treatment two or three weeks back, that were almost worthless for use in a strong light. Had the slides been simply allowed to remain in a dry place for a few days, they would have righted themselves. Plumbago is an excellent lubricant for the sliding portions of woodwork, and is the one generally used. It has, however, the disadvantage of soiling everything it comes in contact with. It is not generally known that powdered talc—French chalk—answers the purpose quite as well, and, of course, is much more cleanly to use. Sometimes the folds of a camera bellows are prone to stick together. This may be entirely remedied by rubbing them over with French chalk. This material possesses many virtues in connexion with photography and its appliances.

Reproduction of Feeble Negatives.—It is no unusual circumstance for a negative that may be excellent for one purpose to be next to useless for another. For example, a negative may be thin and veiled and yet yield a fairly good print on albumen paper, or a vigorous one on bromide paper, but it would be worthless for some purposes, say, for instance, a Woodburytype relief. If the negative be a valuable one, few would care to risk its intensification, which might render it unsuitable for its original purpose. In such a case there is nothing left but to reproduce it, and then comes the question of the best method of procedure? It is pretty generally accepted that, for the reproduction of negatives, either same size or enlarged, carbon transparencies are the best in practice. Unfortunately, however, thin negatives are not well adapted for vigorous carbon transparencies, when made in the usual way on the tissue specially supplied for the purpose. The difficulty may, however, be overcome in the following manner. Instead of using the specially prepared tissue select one that contains much less pigment, such as those used for paper prints. Then the shadows will be formed of a greater thickness of gelatine, although they may seem less dense than if the former were employed. Now, with such a transparency it is easy to obtain almost any degree of density by simply treating it with a solution of permanganate of potash. By this method of intensification it is the gelatine that is acted upon and not the colouring matter, as in the case of a silver image. The colour conferred by the permanganate has the advantage of being of a highly non-actinic character. Having got a strong transparency, it is a very easy matter to obtain a vigorous negative by almost any process.

VARIATION IN COLLODION EMULSION WORKING.*

The strength of the final sensitising bath, it may be remarked, may be varied with advantage according to the treatment to which the plates are to be subsequently treated as regards development and other circumstances. For instance, if they are to be used wet, with excess of silver and iron, and silver or acid pyro and silver development—in fact, as ordinary wet plates—the strength of the silver solution should be at the maximum within the limits we have given, or, if the highest degree of sensitiveness is required, with alkaline development; but, for moderate rapidity, under the latter form of development it will be found more convenient to employ the solution weaker, as the necessary removal of the excess will be more easily effected, and the chances of fog or abnormal reduction greatly decreased. It must be clearly borne in mind that, when alkaline pyro or any of the similar methods are employed, the film must be absolutely free from the slightest trace of soluble silver salts, or the inevitable result will be the production of dense fog immediately the developer is applied; but, when the reducing agent is used in the acid state, the free silver forms a necessary adjunct to the developing process.

When the plates are to be used without the removal of the free silver, it is, perhaps, necessary to exercise a little more care in the composition of the sensitising bath than is the case otherwise; so far at least as the employment of a plain and clean solution, and not an old printing bath or similar substitute, is concerned. The acid developer is far more liable to set up abnormal reduction than the alkaline, and to produce stains and markings, more especially with imperfectly cleaned glass. A glass plate that would successfully pass the ordeal of alkaline development might be hopelessly stained and smeared if submitted to treatment with iron and silver. Beyond this, however, the silver development method presents no difficulties, and the routine is practically identical with that of ordinary wet plates.

The very finest results as regards quality, though at the expense of a certain increase of exposure, are obtained by means of the pyro and silver developer. The character of image so obtained very closely

* Concluded from page 228.

resembles the old style of pyro-developed films of iodide of silver not only in the richness and vigour of the deposit, but also in beauty and variety of colour; but the tendency to harshness or excessive contrast is wanting. For transparencies, opals, or photo-mechanical and similar purposes, the pyro developer is certainly to be chosen, and the formula may be as follows:—.

Pyrogallic acid	1 grain.
Glacial acetic acid	20 minims.
Water	1 ounce.

This will keep in good condition for some days; in fact, is all the better for having been made at least twenty-four hours before use; but it should be thrown away as soon as it becomes at all discoloured. There is no occasion for any further complication in the shape of additions of alcohol or other matters to the solution, as the acetic acid suffices perfectly to make the developer flow smoothly.

The plate, after sensitising, is allowed to drip until the greater part of the superfluous solution is removed, and is then drained for a few moments upon a slip of blotting-paper, or the latter may be drawn gently along the lower edge of the glass where the drainings have accumulated, and the plate is then transferred to the dark slide for exposure. This should be preferably of the old single wet-plate type, with silver-wire corners, as, if all four edges of the film are in contact with the rebate of the ordinary dry-plate slide, it will be next door to an impossibility to develop an image free from stains; besides which, the contact of the silver solution with the woodwork of the slide not only unfits it for use with ordinary dry plates—unless thoroughly cleaned—but rapidly deteriorates or destroys the slide itself. It is always well to insert a strip of blotting-paper in the lower rebate of the slide to absorb any drainings that may accumulate during exposure.

With regard to the length of exposure requisite, no definite guide can be given here, beyond saying that, with pyro development, the plates may be reckoned as equal in sensitiveness to a somewhat slow wet plate, or, if iron be used, to a rapid wet plate; some care must be devoted to the study of what constitutes a correct exposure, as silver development affords little or none of the "latitude" to which modern dry-plate workers are so prone to trust.

The exposure having been made, the plate is taken from the dark slide by means of a pneumatic or other holder, if the fingers are to be kept clean—for it must be remembered that it was to wet-plate development chiefly that the photographer of a past generation owed his reputation for dirty hands, and the art itself its descriptive cognomen of "black"—and a small quantity of the developer poured quickly and evenly over the surface. In the performance of this simple operation some little skill is necessary in order to get the solution evenly and quickly over the plate. If it be dashed on roughly on one part of the plate, the silver solution will be washed away from that portion, and a patch produced, in which the density and detail are less than elsewhere. The solution should be poured gently but quickly along one edge of the plate, which is, at the same time, gently inclined, so as to cause the developer to flow in an even wave over the whole surface, and then backwards and forwards with a rocking motion. To those who have been accustomed to development in a dish this will at first probably present some difficulty, but it rapidly disappears with a little practice.

The quantity of solution employed, too, forms a matter of some importance, since it must be duly proportioned to the quantity of silver nitrate retained on the surface and in the pores of the film, and upon which the formation and density of the developed image depend. Here it may be well to point out, for the benefit of those who are not aware of the fact, that the image obtained by this form of development is produced at the expense of the silver remaining in the free state upon and in the film after its removal from the bath, and not as in the case of alkaline development, by the reduction of the silver salts forming the film. Clearly enough, then, with a given quantity of silver nitrate clinging to the film, it is necessary to limit the quantity of the reducing agent in order to obtain a certain result. The more concentrated the developer—that is, the smaller the quantity of solution used—the more vigorous will be the resulting image, and *vice versâ*, and it is well to bear this fact in mind when making negatives for special purposes.

The action of the developer proceeds very rapidly, much more so than in the case of a gelatine plate, and requires careful watching. The shadows and half-tones should remain quite clear and distinct by reflected light, and the progress of the development should be watched and judged by examining the plate by transmitted light, and stopping the action as soon as the requisite density is secured. If the exposure has been correct—and here we must repeat the necessity for accuracy—density and half-tone will be secured simultaneously, and without trouble; but, in the case of under-exposure, the density will come before the finer details, and hardness will result, while under opposite conditions there will be a want of vigour and contrast. The first fault is irremediable, but the second may be overcome by intensification. Two or three drops of the silver solution are added to the developer that has been already used, or a fresh quantity may be taken, adding, in that case, a little more of the silver; and this is applied to the film until the requisite density is attained, after which the plate is well washed and fixed.

For quicker exposure the pyro must be replaced by ferrous sulphate, which, while it acts more rapidly and with a shorter exposure, gives a more metallic-looking image by reflected light and less vigour by transmitted. The strength of the solution may be varied within pretty wide limits, according to circumstances, but the best "all-round" formula for general work is

Ferrous sulphate	20 grains.
Glacial acetic acid.....	20 minims.
Water	1 ounce.

There is very little difficulty nowadays in procuring sulphate of iron of the best quality, so that we need not repeat the advice of years back on the selection and treatment of the salt. It is simply dissolved in cold spring or tap water and the acid added after solution, the whole being then filtered. This is better for having been made a day or two, but if required for immediate use the iron may be dissolved in hot water and rapidly cooled after the addition of the acid. The same rules apply to the use of the iron developer as to pyro, the only difference between the two being in the matter of rapidity of action. For intensification, however, when necessary, the pyro solution is preferable to that of iron, or, if iron be the more convenient, then an addition of citric acid should be made instead of acetic, say a grain to twenty grains of iron.

Various additions to and modifications of the iron developer found favour with photographers of a past era, but it is questionable whether they conferred any but merely fancied benefits. The substitution of the nitrate and acetate of iron for the sulphate, or, what was equivalent, the addition of certain salts to bring out the formation of these new compounds, was amongst these; but, as has been said, the advantages were dubious, a remark that may be extended to the addition of various salts of copper and of other metals, the real object of which was scarcely clear. There is, however, a strong possibility that, by the use of various organic matters added to the developers, such as sugar, gelatine, and similar substances, decided benefits may be secured in the way of clearness and vigour where those qualities are of especial value. But it would occupy too much space to enter into a lengthened discussion of such matters here.

The majority of our readers will, no doubt, in working the auxiliary bath emulsion process, prefer to adopt the more modern style of development with pyro, or one of its analogues, and alkali, if it is only because it is the more familiar process to them. The results are equally good, the sensitiveness as great, or perhaps greater, under some conditions, and the risks of failure are considerably less.

ON THINGS IN GENERAL.

Mr. Phillips, in his last note, does not bear upon the original point of discussion, which was, as to whether or no Messrs. Hurter & Driffield had forgotten what they had written. He, in effect, reduces the matter to a burlesque on a well-worn quotation from a popular comic opera, "What, never?" "Well, hardly ever." "Almost identically the same" is without meaning in a scientific question. The whole body of photographers, with scarce an exception, understoood Messrs. Hurter & Driffield to hold that ratio of

gradation could not be influenced by variations of development; but, when such a view is questioned, they, to the astonishment of almost every one, write to say that they do not hold such views—"well, hardly ever." Who does the jugglery?

One of the most valuable papers of a practical nature ever read at the London and Provincial Photographic Association (or elsewhere) was that of Mr. Rawlings on *Photographing on Wood*, and the more praise is due to him on account of the fact that his method is open to any one, he having left it entirely untrammelled by patent. One great advantage of this method is the pleasant surface it offers for use with the pencil, owing, no doubt, to the free use of zinc white, one of the properties of that pigment being the agreeable surface it gives for pencilling. It is possible that the Chairman was right in his suggestion that the sensitive surface was carbonate of silver produced by the action of the zinc white on the nitrate of silver. There are, however, two objections to this theory. First, the fact that carbonate of silver is usually supposed to be very slowly acted upon by light, except in the presence of ammonia; and, secondly, zinc white is, theoretically, an oxide, and not a carbonate of zinc, though there are those who hold that it is commonly adulterated with carbonate of lead to give it body, a statement I should not be inclined to give credence to.

Mr. Chadwick's letter in the same number of the JOURNAL in which the report on Mr. Rawlings' paper appears is an interesting contribution to the popularising of knowledge of the human eye; but why does he use the term "sensitiveness" with regard to the yellow spot? The yellow spot, or the central spot, or pit, as it is sometimes called, is not the most sensitive part of the retina, if we are to use the word in its ordinary acceptance. Owing to the much finer organization at this part of the retina, the bacillary layer in it consisting of cones only, far smaller and much more numerous than in the surrounding part, their diameter being about the ten-thousandth of an inch only, there is a far greater "distinctness of vision," or, as Fuellen terms it, in his book of test-types, "acuteness of vision;" but not of sensitiveness. That characteristic is found in a zone considerably removed from the *fovea centralis*.

I am afraid that the subject "Why photographs fade," so well treated of by Mr. Herbert Starnes, will still remain an enigma for long years to come. Mr. Foxlee did well to accentuate the fact that complete fixing was more important than thorough washing. Hypo in the print has been solely held out as a thing to be avoided like a pestilence, that its true position is rarely understood, and at the present time it has become a complete fetish. It is not so much the hypo in the print that has to be eliminated as it is the product of hypo and silver chloride being allowed to assume a dangerous form that is to be provided against. Such safeguarding is most probable when plenty of hypo acting for a sufficient time is used. I possess hundreds of prints on albumen over a score of years old that are as good now as on the day they were printed. Also I possess a great many of which an entirely opposite character could be given. I have developed silver prints of the same age on paper which give decided traces of fading. When atmospheric influence and the effects of improper mounts are excluded, my opinion is that a properly fixed and washed print on albumenised paper is practically permanent.

What a remarkable, and, to an old hand, refreshing, thing has been the unexpected appearance—in one month too—of two papers on wet collodion, from the pen of experts. An old photographer once said in my hearing, to a recent amateur who was complaining of his difficulties with dry plates, "Bless your life, sir, you don't know you are alive." And much truth there was in the observation. I wonder how many of the photographers, now so glib with their experience of processes, would care to practise the art for a single day if they had to pass through the experiences of a collodion man of days almost gone by.

Ah, those were negatives. I have seen, and I hope I have made, some good dry-plate negatives; but the general average of quality of, say, a dozen good dry-plate negatives is not to be compared to that of an equal number of good wet plates. What printing qualities they possessed! What rich tones and juicy shadows! But I do not regret their departure; to go back to the old work would be like a nightmare.

Such recollections make one turn to the recent work of a very old hand at the camera, Mr. Vernon Heath. His work, which I have not yet had an opportunity of reading, is evidently highly interesting in its vivid accounts of the difficulties surrounding the work of the old *régime*. A good negative, taken under the difficulties he will describe, was a thing to be proud of. Nowadays there are few beginners even who have not produced some excellent plates. The regret for the old gives way to thoughts of the pleasure the new has given to hundreds, nay, thousands, of practitioners of our art, so fruitful in producing good cameraderie.

FREE LANCE.

THE FADING OF SILVER PRINTS ON ALBUMENISED PAPER.

[Photographic Society of Philadelphia.]

THE fading of silver prints on albumenised paper is an interesting matter, but one about which we know very little. Those of us who have given the subject any attention have been struck with the singular fact that skill and care on the part of the maker of the prints is no guarantee of their permanency. In fact, numerous cases could be quoted where prints made in the most slovenly manner, with poor materials, and by men so ignorant that they hardly knew the names of the chemicals handled, have actually outlasted the best efforts of skilled and careful photographers.

In most other departments of practical photography we could say that more careful investigation would help us in determining the causes of fading, even if it proved impossible to entirely do away with them; but the subject is an exceedingly difficult one, partly owing to the complex chemical nature of the silver print, and partly from the impossibility of watching the behaviour of batches of prints, or even of individual prints out of a given batch, for years at a time, and of obtaining data as to their manufacture which would be of any practical value.

From the earliest days of silver printing imperfect removal of the hyposulphite after fixing has been cited as a pregnant cause of fading. Although I do not mean to inculcate any carelessness in the operation of final washing, I am satisfied that the dangers from the said source have been much overrated. Assuming that a good commercial sample of the hyposulphite is used, and that no foreign matter like acids be allowed access to the fixing bath, there is really no reason why a print should not last well, even if quite a large quantity of the fixing salt remains in the paper. Of this fact I am certain.

I have seen prints made by an experienced maker of albumenised paper, which had merely received a couple of rinses after fixing, and were then immediately dried. These prints were several years old when I saw them, and had remained perfect in every respect. This gentleman agreed with me in condemning the excessively long soakings and washings then customary, sometimes lasting for four-and-twenty hours. Experiments made after my interview with him bore out his statements to my perfect satisfaction.

I will now ask your attention to a point in silver printing which I have been led to believe has an influence upon the permanency of the print, and one which I do not remember to have either read or heard mentioned. Let me say, however, that I do not advance it as a universal cause of fading, but as one of the ways in which an explanation may be given of the wonderfully contradictory behaviour of prints from the same batch, made in the same manner.

Every one who has tried silver printing is aware that even the successful toning of the print cannot be accomplished if there is free nitrate of silver left in it, but that the said salt must be washed away before the print is risked in the gold bath. Neglect of this means red patches and streaks, alternating with ashy blue tints and mealiness over the entire print, and oftentimes precipitation of the gold in the bath, and consequent stoppage of the toning action. But this is not all.

The proper forming of the image on a silver print demands the harmonious chemical action of three distinct compounds of silver: the first, chloride of silver; the second, the organic colorific compound of albumen and nitrate of silver; and the third, free nitrate of silver in excess. When a print is taken from the frame and washed, the chloride and a certain portion of the darkened organic compound remain unaffected, while the free nitrate, and in all probability a considerable amount of the organic compound, are washed away. Now, the point I desire to ask your consideration of is, whether the too complete removal of this organic compound, in the washing before toning, may not injure the stability of the print by robbing it unduly of one of its important component parts before the gold has had an opportunity of depositing upon it and ensuring its permanent abode in the print. The objection may be raised that the hyposulphite would remove it in the fixing, but if the gold is well deposited upon it it would remain.

I am aware that this idea may seem far-fetched, but we can find analogies to it in several departments of photographic chemistry. Take, for instance, the manufacture of washed collodio-bromide pellicle. Here the bromide of silver is formed in the collodion by adding nitrate of silver to collodion containing a soluble bromide. In order to get rid of the lye salts which come from the double decomposition between the bromide and the nitrate, the emulsion, after setting, is washed in water to remove them. But it sometimes happens that the pyroxyline is of a variety that will not bear the washing without parting with an organic compound between the silver and the pyroxyline, which seems to form during the ripening of the emulsion. When such is the case, the resulting pellicle gives thin, foggy negatives, and is in every way unsatisfactory.

It was long ago discovered that nitrate of silver reacts with such substances as albumen and gelatine (less so with pyroxyline), entering into combination with them; and, as I have already said, the albumen compound is the important colorific substance of the silver print. Another fact that seems to help in bearing out my idea is, that prints from which all traces of silver are thoroughly eliminated, as, for instance, by prolonged boiling in some chlorinous solution, refuse to tone.

We are therefore driven to the conclusion that prints must contain an appreciable quantity of silver in order to take the gold properly during the toning; but, on the other hand, we know that an excess of the silver is incompatible with good toning, as I have already remarked. It may, then, be fairly asked how long the prints ought to be washed before the toning, and the answer to this question can be found only in practical experience. A batch of, say, 150 8×5 inch prints put into one of the largest porcelain pans obtainable at the stock dealers, and set under an ordinary dark-room tap, would contain a large amount of free silver after half an hour's washing, while a dozen prints of the same size would probably be ready to tone after ten minutes' immersion, or less.

But another objection may be raised. The question will be asked why some prints from every batch fade in a comparatively short time, while the rest remain white for years and years. Now, to answer this, I must ask you to remember that, excellent as our commercial brands of albumenised paper are, it is, nevertheless, an impossibility to coat sheets with albumen so evenly that it shall be of just the same thickness or body at every part of the sheet. The behaviour of the prints, both during the printing and after they are finally dried, proves this. Every practical printer knows the value of the thick ends of the sheet, and, if he is a careful workman, reserves them for the most difficult subjects. Prints made on these "thick ends" will curl in a refractory manner when dried, owing to the heavy body of albumen on the paper, while those made on the more central portions of the sheet remain flat.

Remembering this, is it not fair to assume that prints, even when made from the same sheet of paper, will not part with the organic silver compound equally when washed before toning, owing to the variable thickness of the albumen, and will thus present to the gold a variable quantity of the important organic constituent?

Before proceeding further, let me say that I hope this theory is not a tenable one, for, if true, I do not see how things could ever be improved or rectified. I am afraid, however, that there is some truth in it. The fact that prints toned in the chloride of lime toning bath, without any washing whatever to remove the silver after coming from the frame, last fully as well as others made in the usual way (better, indeed, in some cases), is another item in support of the view I advance.

An enumeration of all the possible causes of the fading of silver prints would be indeed lengthy; but I wish to direct attention to the want of reliability of a mountant which, until very recently, I had always considered quite safe, and have myself largely used. I refer to gelatine, either when dissolved in water alone, or in water with alcohol added to prevent cockling of the mount—not only as a mountant in the usual sense, but also, I regret to say, as a material for cementing prints to glass, or as a sizing. My attention was first directed to this by an able editorial in THE BRITISH JOURNAL OF PHOTOGRAPHY, in which the statement was made that there had been complaints made of the beautiful "cemented prints" fading in a surprisingly short time. I had scarcely read this article when I became aware that a handsome frame full of cemented prints owned by this Society showed unmistakable signs of fading, and when I last saw them they were in very bad case. Prints of my own, made with the greatest care and best obtainable material, have behaved in the same manner. I am also informed by one of Philadelphia's oldest and most learned photographers that a particular style of print in which he used gelatine in one of the finishing processes has not lasted as well as he might have expected after the great care expended upon them; and the same gentleman strongly condemned the mounting of prints on cards with gelatine in any form, preferring starch. My own experience goes to the support of this statement in the most positive manner. Prints that I have had by me for more than twenty years, and mounted with starch, have lasted well, while almost every gelatine-mounted print in my possession has faded more or less, according to its age. I am the better prepared to say this from the fact that I have within a few days carefully examined the contents of a portfolio that had been laid away for many years.

If I were asked what are the important matters to care for in printing, as regards permanency, I should reply: A good albumenised paper, *free from smell*, worked in as strong a silver bath as the salting of the paper would allow, toned rather rapidly after the minimum of washing, and, if necessary, adding common salt liberally to the toning bath to make up for it; to wash off the gold thoroughly before fixing, and to have the fixing bath strong and lukewarm to the finger; to work the prints about thoroughly during the fixing and the first rinses after fixing; to wash them in rapid changes of water; to avoid gelatine as a mountant, and, finally, to rub in wax after rolling, the best means being to reduce pure white wax to the consistency of soft butter with turpentine and a little oil of lavender. I prefer this to the ordinary burnisher.

ELLERSLIE WALLACE.

THE EARLY DAYS OF ANIMAL PHOTOGRAPHY.

(JOURNAL OF THE CAMERA CLUB.)

THE slides which are presently to be brought before you on the screen are some of the results of the first photographs of wild and other animals taken systematically, many of them dating from the year 1864, and I think you may be interested if I say a few words about the early days of animal photography.

Wishing to try to produce a series of photographs of wild animals, I endeavoured to learn what had been previously accomplished in this direction, and could not find that any such work had been carried out by anybody in any country; the only person I could hear of as having done anything at all in this branch of photography was the late Count de Montazon, who had taken some negatives at the Zoological Gardens. Having received, through Dr. Sclater, the requisite permission to instal myself at the Gardens, and finding I could reckon upon the able assistance of Mr. Bartlett, so many years the Superintendent, I began with a few trials, which gave sufficiently good results to show me that I was not undertaking too much, and also taught me that it was necessary to proceed methodically, if any work of use was to result. I decided that to be of any value for publication, nothing would be as interesting and useful as stereoscopic pictures: firstly, because only in the stereoscope can the real form of an animal be seen—no single picture will show anything approaching the beautiful effect thus obtained, not even on the screen; secondly, it was only this way the animals could be seen away from the bars, behind which, it was certain, the greater number would be taken, as in those days they were not the open dens and roomy spaces of later years. As there is at present a revival of stereoscopic photography, may I, as having seen the flow, high tide, and dead—very dead—low water of stereoscopic work, here speak of what, in my opinion, caused such a complete stoppage of this beautiful and valuable branch of photography, that to-day many grown and educated persons have never seen a stereoscopic picture. One cause was the fatal error, I believe of French origin, of making the pictures too large (it must be understood I am only referring to the lenticular instrument), and, therefore, mounting the same points of the pictures at such a distance apart that the normal pair of eyes could not combine them. Other causes also had much to do with driving it out of fashion. The unnecessarily high magnifying power and inferior quality of the lenses, which strained the eyes, the incorrect way the instruments were made, the great difficulty in illuminating the pictures when being examined, and carelessness in not reversing the prints when mounting them, or even sending them out with both prints alike. In these days of "You push the button, and we do the rest," the public soon tires of anything that is troublesome to work. I know only one really good instrument, and this was invented by an uncle of a member of your Club, and was the outcome of an accident. Returning to our subject, the next step was the question of the size of plate. It was then usual to use patent plate glass: this was settled to be 7½×4½ inches, as giving plenty of space for the size required, and allowing draining room for the silver solution. The late Mr. Dallmeyer advised me to use portrait lenses, and those selected were his No. 1 n long focus, and were carefully paired. In 1891 you have a variety of lenses to choose from, of almost every conceivable type; yet I think, were I now going to take more of these photographs, I should prefer the kind I used in 1864. I

do not want so-called depth of focus, but prefer a lens which I can use at a very large aperture, which gives me the object exceedingly sharp, and the surroundings rather out of focus. You will presently see that I could not always do what I wanted. I usually used what was then known as Stop No. 2, and sometimes No. 3. I cannot tell you the diameter in focal measurements. Of course, the only method of working in those days was wet collodion, and younger photographers can have very little idea what it meant to run an animal about in its enclosure on a broiling hot day, endeavouring to tire him out; then rush off, shut yourself up in a close tent to prepare your plate, coming out with eyes watering from the ether vapour, to find your subject refreshed by the interval of rest, and having to commence *de novo*, knowing your plate was rapidly spoiling. Just compare this with the present dry-plate working; no such things as dry plates, orthochromatic or otherwise, were then known, no developing at home whenever you liked, and none of the many valuable improvements and inventions which are to-day at your command. The exposing of the plate was done without any of the elaborate paraphernalia at present so much in vogue—no shutters of one-hundredth or five-hundredth of a second, they would not have been of much use; no india-rubber balls and tubes, delicate pneumatic brakes, pistons, or roller blinds; only the sweet simplicity of a flap shutter, moved by the thumbs and fingers, by which an exposure of a quarter to a fifth of a second could be given. I had no finder, and in those days the focussing glass was not even hinged to the camera, but had to be removed to allow the dark slide to take its place. Of course, the camera was mounted on a tripod; a hand camera was not used, for the excellent reason that the instrument had not then arrived at that stage of progressive development.

Many of these plates were kept over half an hour in the hot open air. The work could only be attempted on bright, clear days, and I could not do that which has been so strongly recommended—expose always without sunshine. I do not like the principle of long exposures for animals, as I have never seen them quiet for one second in a position I should care to take; neither do the very rapid exposures of other workers please me. I see little utility in taking animals in motion, unless for such experiments as those so elaborately and exhaustively carried out by Muybridge and others; but I like to see a lively, bright look about an animal, with its attention attracted or arrested. This brings me naturally to the concluding portion of my remarks this evening. What should be the position of the animals, settled in my mind as the best, in which I should endeavour to photograph them? I am well aware very much has been said here and elsewhere on this subject, and perhaps many present will not agree with the view I am going to speak about. However, when these photographs were taken, very many of the best known names as photographic workers at present were perhaps thinking more about toffee and tops than of photography, and I had the great advantage of not having to decide where doctors differ. I concluded, then, that the best position, where only one was wanted or could be taken, was always in profile; and the more I see of later work, and the more I observe animals, the more convinced I am of the correctness of my determination under the above condition.

In this I am thoroughly backed by a gentleman, whose acquaintance I have only made within the last few weeks, who brings to bear upon his splendid photographs of horses and other animals an unrivalled knowledge of horseflesh, having for many years studied and practised, not only as a veterinary surgeon, but also as a horse-breaker, tamer, and dealer. His books on horses may be known to some of you—I refer to Captain M. H. Hayes. I have not the honour of being in any way connected with this very genial and modest photographer and gentleman. I made his acquaintance after hearing his lecture on horses at the Polytechnic, and, in conversation with him shortly before he sailed for South Africa, he made a remark about position I thought conclusive. Said he, "How do you place a horse or a dog if you want to look at him with the idea of either buying or selling? Why, in profile, and in no other way; and, when you have had a good profile view, you walk round him and look at details." He further says, there is no other position in which any comparison of any value can be made between similar animals. Having secured the profile, there can be no possible objection to photographing your subject in full details, from the muzzle to the tip of the tail; its hoofs, feet, horns, eyes, ears, the front, back, or any other view, and many of these would be of great value. I am not going to show you all profiles; I had no chance of being able to do so. Having no predecessors in this work, I had nothing to indicate to me the safe road, neither beacons to warn me of the points I should avoid. I was obliged to feel my way very cautiously, and try to work up to a certain standard fixed in my mind, using a great love of animals and a slight knowledge of horses to assist me, and I must ask you not to judge by the present standard the work of the earliest days of animal photography. I should mention that many of the slides were made twenty-six years ago. As the photographs are shown, I will say a few words about any that I think will interest you, and shall be pleased to reply, to the best of my ability, to any questions any one present may wish to ask. FRANK HAES.

[The slides shown included photographs of seventy-five animals, mostly wild ones, and a few reptiles; among them—Jumbo in his youth, his friend Alice, who was burnt in the United States, the zebra that Rarey tamed *pro tem.*, the first zebra foal born in England and its dam. Winners of races: Caractacus, Diophantus, Favonius, and Hannah. A slide of the dromedary standing at rest, to show that the natural position of the legs is the same as that shown by the horse, zebra, antelope, or rhinoceros. A portrait of the aye-aye of Madagascar, the first one seen in Europe, and also one of the sable antelope, known previously by skin and horns only.]

DEVELOPMENT OF INSUFFICIENTLY PRINTED PROOFS OF CELLOIDIN, OBERNETTER, ARISTO, MIGNON, AND SIMILARLY PREPARED PAPERS.

[*Photographische Correspondenz.*]

Of all direct printing papers the so-called gelatino-chloride and collodio-chloride of silver papers are those which are the most sensitive, they printing in one-half and one-third the time of sensitised albumenised paper. Yet it may be desirable to still shorten the time required for printing these papers, especially on foggy winter days, not losing sight, however, of the fact that any result, to be of any practical value whatever, must bear comparison in tone and general richness with the best of silver prints.

Of the advantages of employing a good developer for bringing out insufficiently printed proofs there are many. 1. The time used for printing may be shortened to a quarter, or even one-fifth, of that necessary to give fully printed proofs. 2. When daylight is not readily obtainable, it is possible with artificial light, such as that produced from magnesium powder, to produce prints of a beautiful warm colour. 3. It is possible by this process to obtain tones which fully printed proofs, without development, can never give. 4. Finished prints of an agreeable tone may be readily produced from insufficiently printed proofs showing the slightest impression of a picture only, as well as from those which have been almost fully printed out.

Experiments for obtaining a developer suitable for papers ordinarily used for printing out there have been but few, and these have been restricted to the employment of gallic acid. Formulæ of this description have been published by Liesegang* (gallic acid, tannin, acetate of soda, and water), Lebedzinsky,† Legros,‡ and others.

Der Amateur Photograph§ reports a similar process, recommending as a developer a concentrated solution of gallic acid, neutralised with bicarbonate of potassium. All these baths act after the manner of the gallic acid developer known for the last thirty years for making enlargements on salted papers.

Developers containing gallic acid are more or less liable to turn bad; they often produce on the prints a muddy deposit, and cannot be successfully used for all brands of paper alike. Often also I obtained on papers otherwise suitable tones which did not satisfy me. For these reasons I commenced to look about for a developer not liable to these defects, which would keep at least for some days, and suit most of the brands of printing-out papers at present offered to the trade. My experiments have been made on the celloidin paper manufactured by Dr. Kurz of Wernigerode, Obernetter paper, mignon paper by E. Büchler of Mannheim, "l'apier au citrate d'argent," by Lumière, and aristo paper of an unknown make.

At first I tried alkaline developers, but these proved totally unfit, they producing total reduction of the silver all over the paper, even if very strongly diluted. An exception to this was the hydroquinone soda developer of Baron von Hübl, recommended for his collodion emulsion dry plates. Mixed with a sufficient quantity of bromide of potassium, this developer gave, on Dr. Kurz's celloidin paper, fairly good results. Copies, however, showing, to commence with, a very faint impression only, could not be developed without a muddy deposit making its appearance.

* *Photograph. Arch.*, vol. xxviii., page 31.

† *Sposob uzyzia Papieru Kolodijonowego emulsyjnego.*—Warschau, 1890.

Distilled water	1000 parts.
Gallic acid	4 ,,
Citric acid	6 ,,
Acetate of soda	20 ,,
Solution of citrate of lead (1 : 10)	15-20 ,,

To be filtered (will keep about eight days).

‡ *Bulletin de la Société Française de Photographie*, 1891, page 152.

§ *Allgemeines Anzeigeblatt für Photographie* (1892), p. 20.

‖ A. Soda

	40 parts.
Sulphite of soda	6) ,,
Bromide of potassium	4 ,,
Water	200 ,,
B. Hydroquinone	10 parts.
Alcohol	100 ,,

Ten parts of A are mixed with from three to four parts of B, and diluted with forty parts of water.

I therefore commenced experimenting with acid developers, starting, n the first place, with Baron von Hübl's hydroquinone intensifier for collodion plates. It consists of a solution of silver, and a solution of hydroquinone, five parts; water, 500 parts; and citric acid, 2-5 parts, the latter solution acting on celloidin paper by itself as a developer.

Further experiments showed the advantage of an addition of sulphite soda, and were the foundation for the following formula for developing insufficiently printed proofs on celloidin and aristo papers:—

A.	Hydroquinone	10 parts.
	Alcohol	100 ,,
B.	Sulphite of soda	100 parts.
	Water	500 ,,
	Citric acid	5 ,,

Fifty parts of A are mixed with fifty parts of B, and then diluted with 1000 parts of water.

This developer acts clearly and clean, but slow. The violet tone of the faint impression takes a yellow-brown colour, and the development is finished in from ten to fifteen minutes. The prints are washed for a short time in water to free them from any adherent developing solution, and are then transferred to the toning and fixing bath.

The formula for the latter is the same as that recommended by Lumière for his "Papier au citrate d'argent," and consists of—

Water	500 parts.
Hyposulphite of soda	200 ,,
Sulphocyanide of ammonium	25 ,,
Alum	30 ,,
Solution of acetate of lead (1 : 10)	40 ,,

This mixture is warmed on a water or sand bath to about 140° Fahr., when the sediment will very quickly settle. It is then filtered, and one hundred parts of it are mixed with fifty parts of water and ten parts of a one per cent. solution of chloride of gold. The prints take in this solution first a yellow colour, and go then over to a reddish brown, and at last take a beautiful, deep, purple tone.

Toning and fixing are finished in about ten minutes. The prints are then washed in running water, and will, after drying, show no change of tone. If, in the foregoing formula, "brenccatechin" is substituted for hydroquinone, there results a developer with good keeping qualities, working, however, very slowly, and giving tones of a more pronounced violet colour. Although both these developers gave very good results on most of the above-named papers, they yet do not answer for all makes. I therefore made further experiments with other developing agents, resulting in a formula suiting alike all known brands:—

Water	1000 parts.
Sulphite of soda	100 ,,
Pyrogallic acid	10 ,,
Citric acid	11 ,,

The ingredients are dissolved in their proper turn, and the resulting clear and almost colourless liquid is used without further dilution. The citric acid acts here, as in all other developers, as a restrainer, and keeps the prints clear. In most cases development is finished in a few minutes, and the well-washed prints take in the foregoing toning and fixing bath agreeably warm tones, from a rich brown to a purplish black.

The celloidin paper of Dr. Kurz is put into the developing bath without any preliminary washing. The prints will develop quickly, clear, and bright, however faint the impression may have been. The tone will change from a reddish violet to yellowish red, and then to a yellowish brown. After development, the prints are washed for some minutes, and hen put into the toning and fixing bath, where they remain until the wished-for tone is obtained.

Bühler's mignon paper, Obernetter paper, aristo paper, and Lumière's "Papier au citrate d'argent," receive before development a preliminary washing; they are then treated in the manner already described, and, the mignon paper especially, will give warm, rich tones. The latter brand, however, has to be treated with considerable care, owing to its partiality for air bubbles.

With all these papers artificial light may be used in printing, and from two to three grammes magnesium powder burnt in any suitable lamp, at a distance of forty centimetres, should prove sufficient.

The above methods are equally well suited to the production of pictures on glass and opals, which carriers are generally coated with similar emulsions for printing-out purposes.

E. Valenta.

PHOTOGRAPHY AND PHOTO-MECHANICAL PRINTING.*

Woodbury Printing.

The next process to which we would direct your attention is the one known as the Woodbury process. This was discovered, perfected, and ied ont on a large scale by Mr. W. B. Woodbury.

The principle of the process is to obtain a metal mould carrying the p cture upon it. Into this is poured a gelatinous ink made of lampblack and gelatine (the pigment that is used for the colour can, of course, be varied). This, when warm, and in a liquid state, flows into all the hollows and gradations of the mould, and a piece of perfectly smooth paper, which has been previously waterproofed with shellac, is then placed on this liquid ink, and, after the superfluous ink is squeezed ont by means of a perfectly level piece of plate glass being placed upon the top of the mould, the ink is allowed to set. The paper can then ba peeled off, and the picture will be found adhering to the paper, its effect of light and shade being caused by the different thicknesses of the gelatinous ink which has been picked out of the mould: that is, if you were to take this picture when wet, and look at it edgeways, you would find that it is in relief. Where the mould was highest, and the ink squeezed away, you would get the high lights; where deepest, or hollow, giving the deep shadows. The picture thus obtained is now put into a solution of alum, in order to render the gelatine image insoluble in water. So much for the general principle of Woodbury type. We will now show you how you can work the process yourselves.

The first thing is to obtain a relief, and to get this you dissolve about four parts of easily soluble gelatine and two parts of lump sugar in fifteen parts of warm water; into this solution about one part of bichromate of potash is added; the solution is then strained through muslin, and poured upon a waxed glass plate, which has been accurately levelled, the warm gelatine spreade itself over the plate, forming a pretty thick gelatine layer, which in the course of a few days will dry, forming a uniform sheet, or can be dried quicker by the use of a chloride of calcium oven, and the film presents this appearance when dry. You have now a film which is sensitive to light, and this is exposed under a negative in a strong light, probably requiring about two hours or so in such light as we have in the middle of the day; after the exposure the film is taken out and allowed to soak in hot water. The parts of the film which have been affected by the light are insoluble, owing to the oxidising action of the light upon the sensitised gelatine, as previously explained to you; where it has been protected by the different shades in the negative, it will be soluble and insoluble according to the amount of light which has penetrated through to it. When the washing is finished, and the film is dry, we have a film in relief similar to the one which we now hold up, and it is from this basis that all the blocks are obtained which we use in Woodbury printing. This gelatine relief is very hard, and will stand an enormous amount of pressure, being absolutely incompressible. You will see, if you look carefully at it, that it carries the picture in different gradations and thicknesses of gelatine, and, if you pass your hand over it, you will find that it is all up and down.

We now proceed to make the printing blocks. The relief is placed upon a steel bed, such as we have here, round which there are fixed projecting edges (these edges prevent the lead spreading sideways under the pressure of the hydraulic press). The relief, together with a sheet of lead about a quarter of an inch thick, is now laid upon the steel bed and put into the hydraulic press, and a pressure given to the whole ranging from 200 to 500 tons. When taken out, you find that the lead has been pressed into the relief, and carries the image upon its surface, only, of course, the exact reverse to that of the relief. Here is a block which has been pressed in this way; here is a relief from which it was taken. We will now pull a print from a similar block to this which we have already fitted up in the press, so that you may see practically how the results of this beautiful process are obtained.

There are several new developments and branches of this process, such as the stannotype and other methods; but, as they are comparatively unimportant, we will not go into this matter now. The Woodbury principle of raised relief is used by Boussod & Valladon, of Paris, for making some of their beautiful photogravure plates; but, of course, in this instance, the relief has to carry a grain, and an electrotype is made from the grained relief, which is afterwards carefully finished by hand.

Collotype.

We have now to endeavour to explain to you the working of one of the most useful processes of photo-mechanical printing, and one which, perhaps, boasts of a greater variety of names than any other modern process. It is generally known by the name of collotype; the Germans call it "Lichtdruck," the French "phototypie," the Americans "phototype," and we English have given it the titles of "photo-print," "heliotype," "autotype," "photo-phane," "photo-mezzotype," "graphotone," &c. The basis of the process is the action of light on compounds of gelatine with bichromate of potash, and in principle it is closely allied to the process we have described to you of photo-lithography, only in this case, not only lines, but all the tones of a photograph from nature can be reproduced; and, as a matter of fact, when prints produced by the collotype process are printed on glazed paper with a suitable ink, there is scarcely any perceptible difference between them and ordinary photo-

* Continued from page 234.

graphs. Of all photo-mechanical printing processes collotype is the most useful and popular; the rapidity by which the prints can be produced render them exceedingly cheap, and it is largely employed for commercial as well as artistic purposes.

We will describe the process as it is generally worked in this country, and afterwards try to show you how the plates are printed.

The basis or principle is, as we have said, the well-known action of light on bichromated gelatine, and we have already told you that if a film of gelatine and bichromate is exposed under a negative, then washed and dried, it will, when treated like a lithographic stone, absorb water where the film has been protected by the dense parts of the negative, and refuse greasy ink; whilst, in the places where light has obtained access to the plate through the clear parts of the negative, it will refuse water and take ink. A collotype plate will not only take ink where absolutely clear glass occurs in the negative, but it will take the ink in the half-tones in exact gradations corresponding to the amount of light passing through the negative. Various substances are used to support the film of gelatine during the printing, which, we may say, is precisely the same as for lithography, and, in fact, lithographic stones were used at first as a support. Copper plates also have been employed, but now we believe that sheets of plate glass, about half an inch thick and ground on the surface, are universally adopted.

PAUL L. WATERLOW.
J. D. GEDDES.

(To be continued.)

OPTICAL PROJECTION.

THOSE who had the pleasure and privilege of witnessing the demonstration at the Royal Institution, February 26, had not only a treat, but an exceptional experience. Sir David Salomons undertook the dual *rôle* of lecturer and demonstrator, and essayed what I should think was a unique undertaking, viz., to show, in the short space of one hour, projections from the ordinary optical lantern, including chemical experiments; also microscopic projections with various powers and different sub-stage condensers and accessories, the polariscope, spectrum analysis, and a new form of apparatus for projecting opaque objects on the screen.

How perfectly it was all performed can scarcely be realised by those not present, but some general description of the apparatus and points of novelty may be interesting. The light employed was an electric arc lamp, supplied from the installation fitted up at the Institution, and adapted to the lantern by means of an adjustable support for elevating or otherwise centering the light from below the lantern. The lantern body was cylindrical in shape, and so attached to the supports that it could be revolved and stopped at any desirable position. This permitted of three optical systems being alternately employed without loss of time, for spring catches denoted the position for true optical axis with the light.

The arrangement of stands for apparatus left nothing to be desired, the whole being completely under control. Switches for the current were conveniently placed, and an electrical glow lamp, supported on an adjustable stand (automatic by pulley and counterpoise weight), supplied the light necessary for reference to notes or for preparing the apparatus for the next experiment. This, in like manner, could be switched on or off, and this prevented the lecturer having to seek the assistance of the attendant for "lights up." An optical pointer of an improved form was used, fitted with a limelight from a compressed gas cylinder, and having a cut-off arrangement. This permitted a slotted aperture, in the shape of an arrow, being illuminated and projected to any portion of the screen, the stand being fitted with universal motions, a white or ghost-like arrow indicating the exact spot the lecturer desired to call attention to.

The microscope and most of the apparatus were improvements or developments of those advocated by Mr. Lewis Wright, and Sir David gave due credit to this painstaking worker. It must, however, be admitted that marvellous advances have been made on anything previously published or shown, and the convenience of the arrangements were such that every facility was afforded for showing all necessary phenomena of light.

The subject of sub-stage illumination had been exhaustively gone into, as well as correction for objectives, and it was found in practice that two condensers, and some specially good eyepieces, gave all the addition necessary to well-corrected table microscope objectives for projecting any microscopic specimens.

The lecturer had found from experience that the amplifiers are not so satisfactory as eyepieces, no matter how perfectly the objectives may be corrected with a view to projection, and thus he was able to show objects enlarged to 4500 diameters with splendid definition, by using suitable eyepieces, with the ordinary powers.

The magnification on the screen represented an enlargement equal to about twenty times that produced in the table microscope usually. This result is a great boon to microscopists who already possess a good instrument, as they will be able to adapt their objectives and eyepieces to a suitable mount for projection purposes. They will, in all probability, have to add to their eyepieces some lower powers, so as to get the necessary range of magnification (both low and high).

The microscope used the other evening was very ingeniously supported by bars and frame, having wire stays to the top of the lantern, and thus was very firm and steady. All the objectives, eyepieces, and condensers could be changed instantly. I never saw apparatus so rapidly manipulated, and at the same time so satisfactory, even to the hypercritical, if such were present. In the case of the polariscope large prisms used for polariser and convenient arrangement for illustrating the various phenomena of polarised light made this little-known subject both interesting and beautiful, and when it was demonstrated to the audience that a bi-axial crystal, on being heated to a certain degree, became a uni-axial crystal, and, on cooling again, a bi-axial (but at right angles to the original), it was felt the *pièce de résistance* had been shown.

As regards spectrum analysis, most of the well-known points were shown by interposing certain colours singly and in combination, and also that white light was made up of coloured rays, by means of a good "white light" slide. In showing the ordinary optical projection front, opportunity was afforded of seeing the chemical experiment of decomposition of water in making hydrogen and oxygen gases simultaneously, and by means of an inverting prism, placed in front of the lantern, the tubes were seen the right way up, and consequently the bubbles of gas ascending. The lecturer was also able to project photographs of the lantern and apparatus, and the electric light arrangements on the screen, as well as illustrate the many uses electricity had been applied to in his own case for domestic and useful purposes.

The new apparatus for showing opaque objects, which the lecturer called, as he explained, for the want of a better name, the "Solidoscope," is a distinct departure, and a most successful one. An oblong, rectangular box is arranged with an aperture at each end at the height of the lantern front, and arranged inside are two total reflection prisms—one to receive the light and send it down on to the object, placed on an adjustable support; and the other to reflect it on the screen, after being magnified by a small photographic lens, placed in the right position between the object and that (the second) prism. Objects such as Barton's button—a very fine specimen, by the bye—coins, and the works of a watch were most clearly shown.

All the apparatus was of the highest order; and, technically, as perfect as possible; but, from Sir David Salomons' exhaustive experiments, it is, I think, evident that it will be possible to place in the hands of science teachers, and all interested in optical projections, apparatus of a much simpler kind, capable of illustrating the phenomena of light, by practically utilising the result of his research and applying same to modifications of apparatus in existence. This, however, could not have been if so much time and money had not been spent to show what was necessary and what was possible of achievement in the way of optical projection by well-constructed apparatus. For instance, as in the case of the microscope we now know that eyepieces are the proper thing to use with *ordinary* objectives, so, in like manner, it will be found that the polariscope can be made with artificial prisms of glass or else polarisers made of bundles of glass, that will be an economical apparatus, giving very fair and practical results when provided with proper convergent systems and suitable means of parallelising the light. Prisms are always costly, especially when large, as they have to be for projection work; but surface reflectors can be obtained that for ordinary work form fairly good substitutes. This, however, only applies to the opaque apparatus and vertical attachments, &c.; for, with the erecting apparatus, a prism must be used, and for the analyser of the polariscope, also, a Nicol prism of fair size is necessary to secure satisfactory results.

G. R. BAKER.

PHOTO-MICROGRAPHS IN THE LANTERN.

[Elizabethan Photographic Society, Barnet.]

I INTEND to divide my paper into three parts, and at times I am afraid it will appear rather dry work. At first I must deal with the subject of making photo-micrographs, then I will show you on the screen some insects and parts of insects that have had their photographs taken on

purpose that you may see how they look when highly magnified, and at the close I hope to show you some natural objects by the aid of the microscope on the screen, and, should the small living things last long enough in their small glass cells, to project some of the more visible insects in water, all of which I expect are well known to you, and will need no description.

In trying to make myself clearly understood, I shall avoid all scientific terms, and as simply as possible describe my method of working. All the apparatus that is necessary is the lantern microscope and a rather long-bellows camera, and a light of some sort to illuminate the object. All the negatives of the objects that I shall show to-night have been made with the apparatus on the table, with the addition of the camera, which I did not think that it was necessary to bring.

First, we have to consider the light. This may be an oil or gas lamp, or, as I have here and use myself, a limelight, which gives a very beautiful, clear, white, evenly illuminated disc, and very easily under control; it can be cut down, moved backwards and forwards—in fact, one can do anything you like with it, care being taken that the light is not too powerful, or it will so flood the object with light that the very delicate tracery of your object will be lost. And in all your low-power work, it is well to use a moderator, in the form of a piece of coloured glass, now behind the object; but in front of the light it is necessary to place a lens, which we will call a condensing lens—that is, to collect the light from the radiant and cone it down on the object, so that all, or nearly all, the light that you have, whether it be oil or limelight, is made to pass through the diaphragm of your microscope stage on to and through the object. But before it reaches the object there is a small lens called a secondary condenser, placed in such a position of the cone of light from the condenser to carry it on and to the objective before the beam crosses. Now in this beam is placed the object to be photographed, held in its position on the stage by a pair of spring clips. Great care should be taken that the object is clearly and evenly illuminated.

We now come to the most important part of the instrument, the objective—that is, the lens that magnifies the image, which must be of different foci to suit the object. If you want to photograph a spider, you must use a long-focus lens, that is one of a low power, about three inches, so that the whole of the object comes in the field; but if you wish to photograph a very small object, such as the dust, or, properly speaking, the feathers off a butterfly's wing, such as I shall presently show you on the screen, it will be necessary to use a much higher power, so as to magnify it so much that you can very easily see the beauty of the different forms of scales. On some moths there are as many as seven distinct scales and hairs to be found on one moth. This would require a lens magnifying about 150 diameters, but the most useful one to use is the one-inch.

Having got to the magnifying lens, and chosen the object that we want to photograph, you will see that a camera of some sort is necessary, and if one wants to be able to make pictures of any objects, such as the bacteria—which are the smallest living objects at present known, and they say half a million can rest on the point of a needle—to a good fat garden spider, you must have several lenses and a camera of rather a long extension bellows, so as to give a good range of adjustment, for at times one may have to close the camera up to, say, four inches, and at another time it may want extending to nearly three feet. I have not said anything about the body-tube and eyepiece, but these can be used, and are absolutely necessary for some work when very great amplification is required, such as photographing the very minute organisms I have spoken about.

At the end of the camera, I need scarcely say, there must be a focussing screen, which is usually of very fine ground glass. Now, for micro-photographic work it is found better to have two movable screens, one of fine ground glass, to focus on and arrange the object on; then take that away, and insert a piece of plain glass, with some very fine lines ruled on it. Then, with a focussing eyepiece, one can bring up the image to a very sharp focus.

Having got so far, we have only the dark slide holding the sensitive plate, and make the exposure. A word or two on the plate here would, perhaps, not be out of place; but I must not keep you too long with dry photographic detail. For many objects the ordinary thickly coated slow plate does very well; but if the objects are stained, such as many of the sections of wood and pathological slides are, as I will show you, or have very dark, yellow parts in them, i is better to use isochromatic plates and a yellow screen—that is ,plates that have been rendered sensitive to certain colours of the spectrum and give truer rendering in monochrome. You can buy them already prepared, or you may prepare them yourself ; but, now the Ilford Plate Company have put them on the market at 1*s.* 6*d.* per dozen, it would be much cheaper to buy them.

I forgot to say somewhere in front of the light should be placed a trough containing a solution of alum to cut off the heat-rays. It does not matter where you put it; in the apparatus on the table, the alum trough is in front of the condenser, which, perhaps, is the best place and most convenient to fix. The heat that passes from the radiant through the lenses, and brought down to a point, becomes very intense, and would burn up your object. This is not so necessary if you are using a paraffin or oil lamp.

T. E. Freshwater, F.R.M.S.

EXHIBITION AT BIRMINGHAM.

The Annual Exhibition of the Birmingham Photographic Society was held in the Y.M.C.A. rooms on April 5, 6, and 7. These were well fitted for the purpose, and the fact that they had recently been supplied with the electric light proved a great convenience when studying the exhibits after sunset and in connexion with the lantern shows. The competitions were confined to members of the Society, and the various prizes offered attracted about fifty competitors, who sent in 422 exhibits. An interesting show of apparatus was made by P. Harris & Co., W. Griffiths & Co., and W. Tylar. The prize winners were G. Wilkes, who secured a medal for "instantaneous work," and a hand camera for work done with a like instrument; J. W. Moore, for landscape, *Aber Mill;* E. H. Jaques, two medals for lantern slides, the President's prize of three guineas for Warwickshire pictures, and medals for "churches" and "doorways;" W. J. Harrison, for Warwickshire buildings; T. J. Davies, "flowers," and quarter-plate views; H. W. Southall, enlargements; S. G. Mason, transparencies; W. S. Horton, Birmingham views; A. J. Leeson, *genre*, interiors, combination prints; W. Rooke, architecture; J. P. Heaton, hoar-frost; Whitworth Wallis, portraits; and E. Winn.

It should be noted that thirteen of the classes were in connexion with the Warwickshire Photo-Survey, and that, in making numerous subdivisions, the idea was to direct the attention of photographers to distinct objects of interest in which the country is rich. The exhibition of the Society of Artists was open during the same week, and many workers with the brush came to inspect the production of the camera men. We made the circuit of the room with more than one artist of repute, and their verdict was, "Very little poor work, but much that is both technically and artistically good." Mr. Seer's *genre* picture of a *Rustic Beauty* attracted universal praise; Mr. Leeson's *Chancel, Aston Church*, was a wonderfully fine interior, while the same worker's combination picture, *A Thirsty Crew* (group of children drinking), received high praise from the judge of its class (Mr. H. P. Robinson). In all the classes the Judges had power to withhold the awards if work of sufficient merit was not presented, and this power was exercised in the case of "Large Landscapes," "Groups," "Seascapes," and "Animals."

Lantern shows were given nightly by Mr. Jerome Harrison, *Rambles in Warwickshire;* Mr. B. Karleese, *Whitby and the Yorkshire Coast;* and Mr. G. A. Thomason, *The Isle of Man.* The splendid triunial employed was operated with great skill by its owner, Mr. Howard Jaques, who took advantage of the capabilities of the instrument to introduce numerous "effects."

At the Annual Dinner, held in the Colonnade Hotel on April 9, Mr. W. J. Harrison announced that the Exhibition had been a complete success, both financially and otherwise. The President (Mr. J. B. Stone) congratulated the various members—Messrs. A. R. Longmore, G. A. Thomason, E. H. Jaques, J. T. Mousley, &c.—who had done so much hard work for the Society. An event of the evening was the circulation of the massive silver loving-cup, won by the Birmingham Photographic Society at the Crystal Palace on the only two occasions when it has been offered for competition.

THE NEW ENGLISH ART CLUB.

The New English Art Club is a small society, but it has compressed within its membership much that is daring, with a great deal that is both good and bad, of latter-day art. The eighth Exhibition, which has just been opened at the Dudley Gallery, is worth the conscientious study of the thoughtful photographer, for it not only shows him not a little which he will do well to imitate, but more—much more—that he should carefully avoid. The Exhibition is, in fact, as unequal as it is unconvincing, and whether regarded from the point of view of drawing or colour contains some of the most extraordinary examples of modern painting ever brought together.

If Mr. Thomas Simpson's *Morning on the Beach* (8) has a reposeful key of colour, it has the additional fact in its favour that it is almost photographic in its fidelity to accuracy of drawing; but Mr. Paul Maitland's *Cheyne-walk West, Noon* (14), indulges in a disproportionate expanse of monotonous foreground which no photographer would dare print. The *Portrait of Master John Mackay* (24), by Mr. G. Thompson, is distinguished by an easy and natural standing pose; and Mr. James S. Hill's *Sketch from Nature* (25) is worthy of Mr. J. Gale at his best. The colouring of *Near Arundel* (26), by Mr. Davidson Knowles, has been much praised, but his clouds are never seen in nature. Mr. G. Clausen's *Spring Flowers* (31), a portrait study of a child with flowers, is a delightfully natural picture. Mr. W. H. Bell's *Hammersmith Bridge* has too much water in the foreground, and is spoilt in being bisected by the line of the towpath. Prince Pierre Troubetzkoy's *Study for a Portrait in Open Air*, a full-length picture of a lady in a wood, may claim to be lighted in a manner which we should hope would be absent from the finished work. The pose, however, is very graceful. Of *Towards the Harbour Mouth, Poole* (48), by Mr. J. Buxton Knight, and *Between the Dark and*

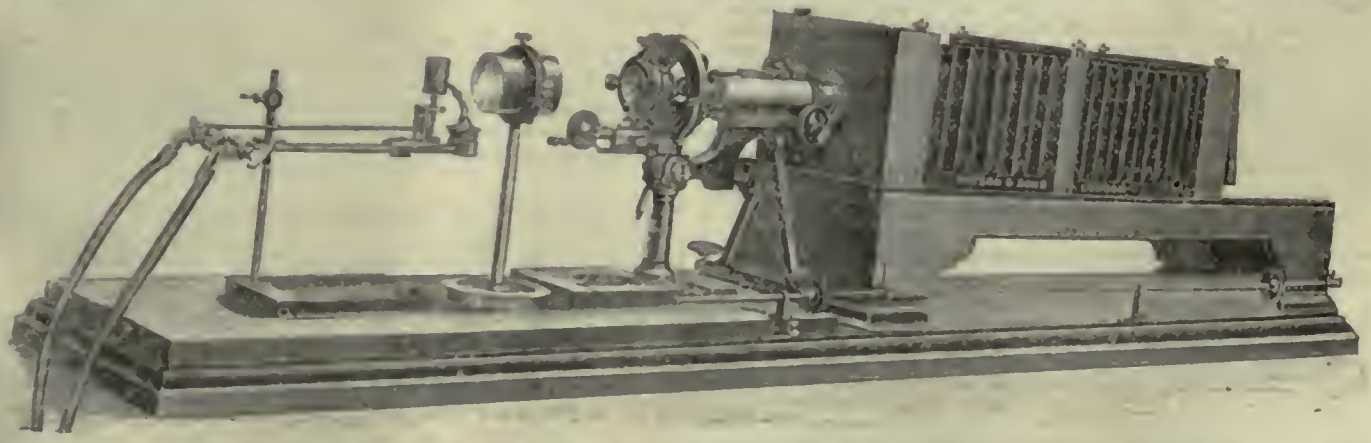
the Daylight (53), by Miss Amy Atkinson, we can say nothing higher in praise than that the subject of the one, grand as it is, is not beyond the reach of the camera, and that the other is eminently suggestive of Mr. Adam Diston's own happy mastery of dimly lighted cottage interiors. Mr. Bernhard Sickert's *Boats on the Medway—Fog Lifting* (55), has omitted the fog; and Mr. Sidney Starr's delightful *Portrait of Miss Nelly Kauffmann* suffers from a perpendicularity of the girl's arms which no photographer worthy of the name would perpetrate. As a combination of land and seascape Mr. W. J. Laidlay's *Sunset from the Cliff* is a grand piece of composition and rich colouring. Mr. C. W. Furse's *Portrait of a Lady in a Grey Dress* (67) is out of line, but the same artist's *Portrait of a Lady in a Brown Riding Habit* (73) is most elegantly posed. Mr. P. Wilson Steer's *Mrs. Albert Petre* (70) represents the unfortunate lady's face turned in one direction, and her eyes in another. Mr. George Thompson's *Portrait* (82) depicts a harshly lighted, unhappy-looking subject, and there are one or two portraits of children which, however good, technically speaking, succeed in nothing so much as arousing our commiseration for the unhappy, frightened-looking little sitters. In this connexion we select for mention Mr. F. B. Chadwick's *Study of the Baby* (92), and Mr. W. Christian Symons' *Portrait of a Boy* (102). Mr. Sidney Starr's *Portrait of Harold Frederic, Esq.* (94), is not so well lighted as Mr. Theodore Roussel's *Portrait of Bernhard Sickert, Esq.* (57)—why the "Esq.," pray?—but this is as soulless as the most over-retouched portrait that ever issued from a Regent-street studio.

It is a pity that the undoubtedly good and excellent work on the walls of this exhibition should have been set among so much which, while it is undoubtedly clever and bold, by no means merits favourable criticism because it succeeds in being unconventional. But it serves the useful purpose of a foil to the better work, while the entire collection, which only comprises about 100 pictures, and is a masterpiece of good hanging, provides an excellent opportunity of studying *fin de siècle* English art in its best (and worst) aspects.

SUMMER NOVELTIES IN APPARATUS.

A Photo-micrographic Camera.

Continuing our remarks from last week on new apparatus by Messrs. Watson & Sons, we give a drawing of a photo-micrographic camera with



a limelight attachment. This drawing shows the relative parts so clearly as to obviate the necessity for supplementing it by any description.

"Optimus" Novelties.

Messrs. Perken, Son, and Rayment have just issued a series of unobtrusive hand cameras of little bulk, covered with black morocco leather. They are at popular prices, yet no sacrifice of quality or efficiency has been made.

We give a diagram of one arranged for dark slides, and another which carries a number of plates on the magazine principle. They both have the necessary adjustment for focussing the lens.

In the magazine form the plates place themselves consecutively before the lens. Each, after exposure, is removed to the back of the others by the aid of the little bag connected with the instrument. A register indicates the number of the particular plate offered for exposure, and it is so attached to the last plate that it is quite impossible for the same plate to be twice exposed.

One ingeniously constructed view-finder is arranged so as o project either a vertical or horizontal image.

A curtain shutter is provided. It works practically without vibration, and gives exposures of varying speeds.

This little camera is rightly named "Minimus," for it is the smallest we have seen to carry a number of plates.

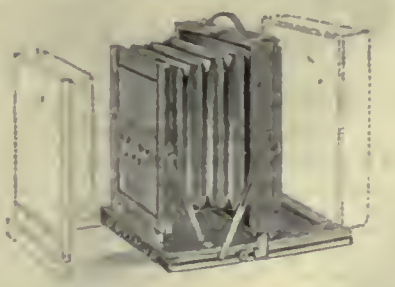
The instrument with dark slides has points of novel convenience. The dark slides instead of being inserted from the top or side are pushed

upwards from the bottom, and are, therefore, not exposed to the attacks of top light. A focussing screen is supplied which may be used when required, and provision is also made for working the camera on a tripod. A neatly arranged drop shutter, giving varied exposures, is fitted on to the front. Altogether, we regard it as a thoroughly practical machine, capable of giving the best possible results. The lenses fitted are either single view, or the "Optimus" euryscope or rectilinear, according to price.

The Cyclists' Camera turned out by this firm is admirably adapted for all who object to bulky apparatus. It is equally well suited for the lanternist, as it carries their special size of plate, viz., $3\frac{1}{4} \times 3\frac{1}{4}$. Fitted with either rapid rectilinear lens working at *f*-8, or the more rapid euryscope working at *f*-6, of $3\frac{3}{4}$ inches focus, the crisp definition obtained allows of almost indefinite enlargement. It is covered with durable black morocco, measures externally $5 \times 4\frac{1}{2} \times 4\frac{1}{2}$ inches, and must become very popular among those who appreciate *multum in parvo*.

Improved Rayment Camera.

Mr. Rayment, we think justly, claims that his present model is among the very lightest of actually rigid cameras offered to the public. It is improved up to date, now possessing a simple and instantaneous mode of attaching the lens board to or detaching it from the baseboard. The connexion, at the same time, forms a means of securing the lens board parallel with the focussing screen, or at any given angle when swinging the screen. The rapidity of opening and closing the camera is greatly facilitated by the additional arrangement for throwing the pinion out of gear with the rack. The rack and pinion are essentially necessary at the



moment of accurate focussing, but it is an immense convenience to temporarily dispense with their action when it only forms an obstruction to closing or opening the camera speedily.

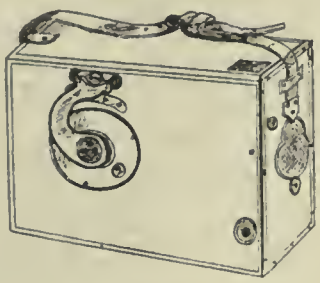
As now arranged, the focussing screen and body may be readily brought close to the front of the baseboard, so preventing a curtailment of view when lenses of short focus and wide angular aperture are in use.

All movements necessary to the modern scientific photographer are included in this compact instrument, and the workmanship is such as to well excuse the firm for adopting the trade mark "Optimus."

THE FRENA CAMERA.

London Stereoscopic Company, 106 and 108 Regent-street, W.

The camera under notice, the "Frena," bristles with new features in every available place. As will be seen from the accompanying block, externally, the camera is of the ordinary box pattern, and is covered with black morocco leather, and is remarkable for its small dimensions, especially when its carrying capacity is considered, the normal load being forty celluloid films, ¾ inch square. On opening the back of the



camera, the reservoir for unexposed films is at once visible, and to fill it it is only necessary to drop the packet of films, which, by the way, are alternated with thin opaque cards, into position. A loose back, fitted with a spring to press the films forwards, is placed behind them, and the back closed, the whole operation only occupying a few seconds. The changing is effected by pressing down the handle at the side, when a single film, with its backing card, falls into a lower chamber, where it is automatically seized and held down by a spring clip. The device for releasing the films seriatim is as original as it is effective; each film is deeply notched along two of its sides, the separating cards are also notched, but in such a way that the notches do not coincide when the pack of films and cards are in position, that is resting on a series of little metal pegs which are made to slide in the sides of the reservoir; when the handle at the side is turned, the reservoir, or film chamber, goes from a vertical to a horizontal position, at the same time the whole set of pegs moves like an escapement, and allows a film to drop, meanwhile gripping the card behind it firmly, a continuation of the same movement releases the card and grips the next film, which is then in position for exposure. It will be noticed in the illustration that the changing handle is fitted with a spirit level, this enables the turning plate chamber to be utilised as a swing-back one, moreover, of the most correct design. As it is pivoted at the centre, the photographer has only to adjust the view in the finder, and to move the spirit level till the bubble is central, and he is then assured that he is free from that bugbear of hand-camera work, "drunken" architecture. The shutter, which is constructed of two aluminium plates, is always covering the lens, a small knot serving to wind up the spring for each exposure. It is capable of adjustment for from ¼ to $\frac{1}{50}$ of a second, this being effected by varying the aperture in the revolving disc, while leaving the spring at a fixed tension. The lens is one of Messrs. Beck's Autograph Rapid Rectilinears, and works with an aperture of *f*-11 at a fixed focus, all objects beyond about thirteen feet being sharply defined. An automatic tally indicates the number of films exposed, showing a figure through an aperture below the changing handle.

Our Editorial Table.

THE "PHOTOGRAPHIC QUARTERLY" FOR APRIL.

London: HAZELL, WATSON, & VINEY.

THE articles in the current number of the *Quarterly*, though few in number, are excellently selected, and withal well written. The paper on "Warm Tones on Bromide Paper," by Mr. E. J. Wall, contains a mass of useful information on a subject of current interest. The Rev. F. C. Lambert, Rev. T. Perkins, M.A., and Mr. J. A. Hodges are among the contributors. The article on "The Photographic Work of Robert Hunt," by Mr. Andrew Lang, F.C.S., is a sympathetically written account of the achievements of one of the Dii Majores of photography.

EXPOSURE NOTES FOR USE WITH THE WATKINS EXPOSURE METER

Birmingham: R. Field & Co.

WE have received a copy of the second edition of this little work which, besides information on its own special subject, contains many items of general photographic interest.

MESSRS. TAYLOR, TAYLOR & HOBSON'S COMPETITION.

THE prize of twelve guineas which Messrs. Taylor, Taylor, & Hobson offered for the best negative taken with their lenses has been awarded to Mr. Acton T. Bucknall, of Kidderminster, for a negative entitled *Unloading*, and the second prize of six guineas to Mr. Charles C. Coulson, of Glasgow, for one entitled *In a Crofter's Cottage Home*. A special prize of one guinea was awarded to Mr. J. A. Pollock, of Belfast, for a negative entitled *In Belfast Lough*. One hundred and eighty-seven photographs were entered for competition. We have received prints from the first two negatives, the subjects of which are artistically chosen and well exposed.

CATALOGUES.

MESSRS. J. J. GRIFFIN & SONS' 1892 spring price list is not intended to be a complete catalogue of photographic goods, the firm's object being only to include particulars of such novelties in apparatus or materials as are of real practical use. In this object they have succeeded admirably.

MESSRS. HINTON'S 1892 Photographic Price List gives particulars and prices of the varied stock of apparatus and material held on sale by this firm, including its many specialities. The list is compiled with evident judgment, obsolete articles being excluded.

Mr. F. V. A. LLOYD, the successor to the late Mr. H. Newton, of 5, South John-street, Liverpool, has submitted to us his Photographic Catalogue. It seems designed to cater for the wants of the amateur, who will find all his requisites included in it.

PHOTOGRAPHIC SCRAPS for April contains a useful article on "The Choice of a Photographic Size," which should receive the attentive study of the amateur photographer. A great many practical hints as to the use and manipulation of the Ilford printing-out paper are also given, which strike us as being equally valuable for gelatino chloride surfaces generally.

THE catalogue of the Birmingham Photographic Society's recent Exhibition is enriched with some illustrations of several of the pictures shown. It forms a pleasing memento of the exhibition.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
April 19	North London	Wellington Hall, Islington, N.
,, 19	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 19	Southport	Shaftesbury-buildings, Eastbank-st.
,, 20	Brechin	14, St. Mary-street, Brechin.
,, 20	Bury	Temperance Hall, Bury.
,, 20	Hyde	
,, 20	Manchester Camera Club	Victoria Hotel, Manchester.
,, 20	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 20	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 20	Southsea	
,, 20	West Surrey	St. Mark's Schools, Battersea-rise.
,, 21	Birmingham	Lecture Room, Midland Institute.
,, 21	Brixton and Clapham	Gresham Hall, Brixton.
,, 21	Camera Club	Charing-cross-road, W.C.
,, 21	Greenock (Annual)	Museum Com. Room, Kelly-street.
,, 21	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 21	Oldham	The Lyceum, Union-st., Oldham.
,, 22	Cardiff	
,, 22	Holborn	
,, 22	Maidstone	"The Palace," Maidstone.
,, 22	Richmond	Greyhound Hotel, Richmond.
,, 22	West London	Chiswick School of Art, Chiswick.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

APRIL 12.—Ordinary Meeting,—the President (Captain W. de W. Abney, R.E.) in the chair.

Lieutenant F. Davies, Major-General F. Lloyd, and Mr. H. N. Harben were elected members of the Society.

The HON. SECRETARY read a paper by Mr. W. E. Debenham on *Relative Exposures for Varying Proportions of Image in Copying*. [This will appear in full in a future number.]

Professor C. V. BOYS then gave a lecture, illustrated by lantern slides, on *Photographing Rifle Bullets*, prefacing his subject by a description of the system adopted by Lord Rayleigh in photographing soap-bubbles and drops of water by the aid of the electric spark. Upon this apparatus the Professor now indicated an improvement of his own, allowing of the bubble to break at a definite point at which it could be photographed, or as soon after as one pleased. Professor Boys said the photographing of rifle bullets was no novelty, and he described the apparatus used by two foreign photographers. In this, the bullet was photographed by means of the electric spark through lenses into a camera, but his own method did away with either camera or lenses, the shadow of the bullet cast by an electric spark being received direct on the plate. At the outset of his experiments he had to determine the lengths of the different sparks, and to ensure a small spark which, though lasting for a very short time, would give enough light. The magnesium spark was too long, although the light only lasted the one-hundred-thousandth part of a second; he thus selected copper terminals, the jar being charged by a Wimshurst machine. The bullet in its discharge struck two wires, a spark was caused between the terminals, and the bullet thus photographed on the sensitive plate. A slide of a bullet from a Martini-Henry rifle showed it to be perfectly sharp, with the waves of air; a second, of the bullet from a magazine rifle, with the new smokeless powder, travelling at the rate of 2000 feet a second, or 1600 miles an hour. In this slide the phenomena of the sound waves and waves of compression were distinctly shown, the lecturer remarking that such phenomena must have been lost by a lens. In another slide one of a series of transverse holes made in the bullet was clearly shown, thus indicating its rotational movement at a certain distance from the rifle. Bullets photographed by magnesium sparks were less clearly defined than those by the sparks from copper terminals. Waves following in the wake of bullets were depicted, and their relative velocities thus estimated. Bullets passing through glass three-sixteenths of an inch thick, produced the phenomenon of a higher density of air within a short radius of the impact due to the lead dust thrown. Bullets travelling in various directions, and numerous other phenomena of air and sound were the subjects of other slides, the lecturer remarking that the physical phenomena shown were of greater interest than the photographic.

At the conclusion of the lecture,

Mr. J. SPILLER referred to some experiments made at Woolwich Arsenal shortly after the Crimean War, in photographing the flight of a projectile from a 36-inch mortar, but the apparatus employed was not sufficiently ingenious for catching the image as it appeared—a globular mass—going through the air. He complimented Professor Boys on the remarkably successful results of his experiments; but, in those which he (Mr. Spiller) was concerned with, they had not the advantage of photographing the object in a closed box.

Answering questions from Mr. England and others, Professor BOYS said the whole of the spark used was one-eighth of an inch long. Sharp photographs of bullets could be obtained half an inch in front of the plate. The rifle bullets were fired through paper tunnels at a distance of twelve feet, the pistol shots at a distance of six feet. It was not difficult to photograph bullets at any parts of their career, but it was not worth the trouble. His object in undertaking the experiments was to provide a method which would be of some assistance to those interested in the problems.

The PRESIDENT, in moving a vote of thanks to Professor Boys, said they had the advantage of seeing the results of a series of experiments carried out with the greatest exactitude. It was a lesson for photographers to imitate; they should not rush at anything, as he was afraid they too often did, but think out their experiments, even if only on paper, and they would not find little details missing at the critical time. It had been a great treat to listen to Professor Boys, whom he (the President) considered a typical experimenter. He was glad that such work as his had been done at the Royal College of Science, South Kensington.

At the conclusion of the ordinary meeting a special general meeting was held, and a Committee appointed to consider the question of revising the rules.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APR 7.—Mr. C. H. Cooke in the chair.

Mr. C. Goodwin Norton was elected a member of the Association.

Mr. ALEXANDER MACKIE, after pointing out the beauty of the transparencies produced by its aid, and remarking that, if it was not the best method for making lantern slides, it was as good as any, gave a history of the *Collodio-bromide Process* since its publication on September 9, 1864, by Messrs. Sayce & Bolton, when it left their hands as a quite workable process. The process in vogue before them was the wet plate, the disadvantages of which led to the introduction of various dry processes, in which the sensitised plates were washed and treated with preservatives. The number of these dry processes was legion, and for the preservatives employed the kitchen was being perpetually invaded. Such films as these were very slow, indeed they could not be exposed too long. The general dream, however, was for one solution for coating the plates, and the possibility of mixing the silver nitrate with the iodised collodion to form iodide of silver in the film was attempted, but it was discovered that the silver iodide would not emulsify. Messrs. Sayce & Bolton, however, noticed that silver bromide went down in comparatively small particles, and attempted the experiment of emulsification with absolute success. The process was still very slow, and many experiments—notably those by Mr. Carey Lea—were undertaken to make it more rapid. It was not until 1874 that Bolton simplified the process by washing the emulsion in bulk. Collodio-bromide, however, never had a fair chance, as gelatine was known in 1874, and Bennett's subsequent improvements quite drove it out of the field for making negatives. They were indebted to Mr. J. Nesbitt for having reintroduced collodio-bromide for making lantern slides. In 1885 he read a paper on the subject before the Photographic Club, in which he demonstrated a simple process, and it was that process which he (Mr. Mackie) proposed to demonstrate that evening.

Coming to the practical part of his discourse, Mr. Mackie observed that for the soluble bromide Mr. Bolton recommended the double bromide of cadmium and ammonium, but he (Mr. Mackie) thought ammonium bromide the simplest and best. As to the ether and alcohol, the specific gravity of the former should be ·725, while of the new methylated spirit he had had no practical experience, although it had been tried by a good man for the purpose, and found to answer. With the silver nitrate used he had never found any fault, but the ammonium bromide did not appear to keep well, after a time parting with some of its ammonia. In this state it would not make good emulsion. He did not recommend the preparation of the pyroxyline, for even experts failed to make two batches alike; indeed, it was the one difficulty of the process. The quantity of pyroxyline employed varied, but he thought the best was that which could be used in the proportion of twelve grains to the ounce of solvents. Having bromised five ounces of collodion with sixty-three grains of ammonium bromide dissolved in a small quantity of water, to which one ounce of methylated spirit had been added, he next gradually added 100 grains of silver nitrate, also dissolved in a small quantity of water, and said the test of success of the resulting emulsion was the colour, which should be ruby red by transmitted light. The emulsion should then be kept for some hours, varying with the bromide employed—with ammonium bromide, ten or twelve hours would suffice. The next part of the process was to get rid of the ammonium nitrate. He himself washed the set emulsion for five or six hours in a pickle jar, the water from the tap running in through a bung, and out through a glass tube let into it. Having dealt with the causes of the difficulties and faults met with, such as crapiness of the film, which he attributed to unsuitable pyroxyline, and transparent spots, often due to pyro dust, Mr. Mackie said his method of cleaning the glass was to use a solution of nitric acid, wash under the tap, and dry. To keep the film on the plate, he applied French chalk, polished, and dusted, and always found the method successful. Another method, however, consisted in immersing the plates in a boiling-hot solution of gelatine, and, whilst still hot, polishing them. It seemed to be efficacious.

Mr. P. EVERITT said he had once used potassium bromide as the bromide in collodio-bromide emulsion work, and, notwithstanding that the potassium salt was insoluble in alcohol, had produced a dense and clean emulsion.

Mr. A. HADDON remarked that Mr. Mackie had said that old ammonium bromide did not produce a satisfactory emulsion on account of the liberation of ammonia. Did he think of adding ammonia to the bromide, and so neutralising? Then, in the case of the bromide being precipitated on its addition to the collodion, would not the addition of dilute alcohol to the collodion introduce sufficient water to redissolve any precipitate of ammonium bromide formed? He (Mr. Haddon), in contradistinction to Mr. Mackie, suggested amateurs should experiment in making their own pyroxyline, as they would be more likely to find out the various causes of their difficulties. The temperature at which the cotton was immersed in the acids was most important. As regards the washing, what objection was there to pouring the emulsion into a large mass of water? By that means they would get a fine state of division, and would eliminate the soluble salts much more rapidly.

Mr. MACKIE could not suggest any better way of restoring the deteriorated ammonium bromide than by fuming with ammonia. As regards the method of washing mentioned by Mr. Haddon, it had been suggested years ago by M. Chardon. Bolton and others had said that precipitated emulsions would not keep.

Mr. J. D. ENGLAND said he had tried Colonel Waterhouse's formula with ammonio-nitrate of silver, acetic acid being added to obviate free ammonia, and found it gave good results. He had found an emulsion washed according to Chardon's method keep good for a month.

In reply to a question of Mr. Archer Clarke,

Mr. MACKIE said he did not pour back the surplus emulsion into the same bottle, as a certain quantity of the solvents would, of course, be evaporated. He preferred to thin down the surplus and filter it again.

Mr. W. E. DEBENHAM, after bearing testimony to the utility of Mr. Mackie's demonstration, said he himself used ether at ·717, as it was desirable to have it pretty strong. He thought crapiness due to the water, which had been insufficiently removed from the emulsion. He had dried the pellicle between sheets of blotting-paper in a box which was placed on an oven.

The CHAIRMAN said he had quickly dried pellicle by placing it on a sheet of glass in a box with chloride of calcium.

Mr. DEBENHAM (continuing) said that Mr. Mackie had stated that the rubber edging did not show where the collodion came over it, but he (Mr. Debenham) found it did, and would therefore keep it within very narrow limits. As to the employment of French chalk, many did not succeed on account of the wrong directions given for its use. A little should be used, and rubbed very hard on the glass; if not rubbed on hard, it would not adhere. He had some emulsion, made five years ago, which he had found five or six times as rapid as emulsions made and used at once.

The CHAIRMAN said he was surprised to hear Mr. Mackie say that he had not found drying marks show after development. He (the Chairman) generally found that they did.

After considerable further discussion, Mr. Mackie was thanked for his demonstration, and the meeting closed.

North London Photographic Society.—April 5, Mr. J. Douglas in the chair.—Mr. A. L. Spiller was elected a member. Specimens of a new rubber cloth for focussing cloths and camera wraps, made by the London Rubber

Company of Liverpool, and of Mr. Otto Scholzig's new collodion paper were passed round for examination and experiment. Dr. Jeserich's paper on *Photography as Applied to the Detection of Crime*, lent by the Photographic Society of Great Britain under the new affiliation arrangements, was read by the Secretary, the lantern slide illustrations being shown by Mr. B. J. Grover. The paper is now appearing in the *Journal of the Photographic Society of Great Britain*, and will, no doubt, be fully noticed in the ordinary way. There will be no meeting of this Society on Easter Tuesday evening, the next meeting being a special Lantern Evening on Tuesday, May 5, when members will have the opportunity of introducing ladies.

North Middlesex Photographic Society.—April 11.—Lieutenant-Colonel J. GALE delivered an address, entitled *Rambles, Rural and Pastoral*, illustrated by lantern slides, to an audience of about 150 of the members and their friends. The slides were divided into sections, according as the predominating interest was purely of a landscape character or depended upon figure subjects. It is needless to say that the slides were marked by a perfection of *technique*. The audience was alternately struck by the boldness and originality of design shown in some of the slides, and the delicate treatment of atmospheric effect in others. The apparent absence of self-consciousness in the models employed was a tribute to the skill of the master-mind who posed them; and the artist's patient watchfulness and sympathetic love for the fleeting and varying moods of nature was marked by the successful manner in which he had obtained effects which, to the ordinary worker, seemed incapable of realisation. Amongst others may be noted one where the effect of a belt of clouds throwing its shadow across a broad down had been secured, when a minute's delay in making the exposure would have marred the picture. The audience marked their feelings by a vote of thanks to the lecturer, proposed in suitable terms by Mr. H. Walker. The next meeting will be held on Monday, the 25th inst. This will be a Technical Evening, and visitors will be welcome, and also at the Society's Outings, which will be held on every Saturday after Easter during the season.

Holborn Camera Club.—April 8, Mr. E. Clifton took the chair and distributed the prizes won at the Annual Exhibition in March.—Mr. Golding took a silver medal for the best picture in the Exhibition, and Mr. West was awarded a bronze medal for the next best picture. Amongst the other prizes awarded was an enlarging apparatus, a flash-lamp, a plate-washer, two clocks, two Thornton-Pickard shutters, a volume of the *Graphic*, a silver matchbox, a gold pin, &c. After these prizes had been distributed to the different winners, a gold pin was presented by the Club to Mr. Bell for the work which he had done for the Club in the office of Treasurer for the past two years. A silver matchbox was also presented to Mr. Benest, the Lanternist for the past two years. Some excellent songs were afterwards given by various members and friends. On Saturday the first official outing of the year was attended with splendid weather. Hampstead Heath was the rendezvous, and some excellent work was done.

Kensington and Bayswater Photographic Society.—April 11, Mr. Sydney C. Mote presided.—A question was read from the question-box, namely, "What is the best method of ascertaining when development of a negative is complete?" Mr. J. D. ENGLAND gave a paper and demonstration on *Celluloid Films*, illustrating his remarks by handing round sheets of the different kinds of celluloid, and by developing some films before the audience. He gave a history of the use of celluloid, stating that it is prepared by the treatment of paper pulp by nitric acid, and, after being well washed, is combined with camphor, cut into sheets of varying thickness, and hung up to dry for a time, often extending to three months. They are afterwards rolled, to give them the required surface. The advantages of celluloid films are their lightness, and consequent portability, as compared with glass, and their comparative freedom from halation. The difficulty of keeping them flat during exposure may be overcome by the use of "film-carriers," which are pieces of cardboard having a thin strip of metal at two or three of their edges. In developing, it is best not to wet the film previous to insertion in the developing solution, but to have a small quantity of water at the bottom of the developing dish, which will cause the film to lie flat, and the developer may then be poured upon it. The varnishes which may be used for preserving the negative on a celluloid film are, first, amber, dissolved in chloroform; second, gold-size, thinned with benzol; and, third, a water varnish, made by dissolving shellac in an aqueous solution of borax. The first two should be applied by means of a soft brush, and the film should be dipped into the last (while wet from the washing), and hung up to dry in the usual way. Mr. England also showed some lantern-slide carriers for celluloid films, invented by Mr. Scanlan. He stated that, by using these carriers, the films were protected from the great heat during the time the slides were being shown upon the screen.

West London Photographic Society.—April 8, the President in the chair, Lantern Evening.—Slides exhibited by Messrs. Stein, Lamley, Grindle, L. Selby, Scantlebury, Hodges, Dixon, Bilton, H. Selby, Rogers. The Annual Dinner will be held on May 13.

South London Photographic Society.—April 4, Annual Meeting.—The officers presented their annual report, which showed the Society to be in a flourishing condition, and that several steps had been taken to increase its usefulness. The work shown at the last annual exhibition was a much higher standard than previously. The programme and list of excursions for the summer session promise to be very attractive. The officers for the ensuing year are as follows:—*President:* Mr. F. W. Edwards.—*Vice-Presidents:* Messrs. Banks, Howell, Munyard, and Rice.—*Committee:* Messrs. Boxall, Eldridge, Fellows, Fitness, Groves, Herbert, Lyon, Miller, and Webb.—*Curator:* Mr. Moss.—*Hon. Secretary:* Mr. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.—*Excursion Secretary:* Mr. W. F. Slater, 169, Sonthampton-street, Camberwell, S.E.

Brixton and Clapham Camera Club.—April 5.—An entertainment was provided for the members and a number of friends, the items being a set of slides by Mr. B. G. Wilkinson, jun., and a set by Mr. Charles Whiting, of the West London Society. These latter comprised an excellent series of Canterbury and Stratford-on-Avon. Mr. Wilkinson's slides were mostly of landscape, with figures, many of them being well know, and tended to shown the pictorial capacities of our art. Mr. W. H. Harrison was elected a Vice-President of the Club.

Richmond Camera Club.—April 8, Mr. Cembrano presided.—A representative of Messrs. James Braine & Sons showed and explained their "Book" Camera, and the "Modern" Camera. Mr. Davis read a paper on *Pictorial Composition*, touching upon some of the principal rules applicable to landscape work.

Croydon Microscopical and Natural History Club (Photographic Section).—April 8, Mr. H. C. Collyer in the chair.—Mr. J. W. SMITH demonstrated an improved platinotype paper that has recently been brought out by Mr. Willis, of the Platinotype Company. Mr. Smith described the working of the new paper, the advantages it practically has over the old hot-bath process, and the liberties that can be taken both as regards exposure and the after-developing. Mr. Smith developed a great number of prints in a cold bath, and, by the apparent ease and uniformity of working, all praise must be bestowed upon the new paper, the results appearing perfect. Mr. Smith then showed and demonstrated an oxyhydrogen-magnesium lamp, whereby platinotype prints may be made by artificial light, the magnesium being burnt in the mixed gases giving off a very bright light, thirty seconds being sufficient for a negative of ordinary density. The light has also the power of toning ordinary albumenised paper so perceptibly as to be of little use afterwards.

Brighton Natural History Society (Photographic Section).—This new organization is, practically speaking, the Photographic Society of Brighton All the prominent members of the late Society have enrolled themselves as supporters of this Section. A representative Committee has been elected, consisting of the following gentlemen:—Messrs. D. E. Caush, L.D.S. (Chairman), A. H. C. Corder, J. Hunter Graham, G. Foxall, W. Mitchell, J. P. S. Slinsly-Roberts, and Walter Harrison (Hon. Secretary). On Friday there was a good attendance, to listen to the Chairman's inaugural address. After referring to the dissolution of the Photographic Society, he congratulated the Natural History Society in having added to its membership so many leading gentlemen that had lately joined; the Photographic Section is a movement which had not been of hasty formation, as the scheme had been before the Council for a long time. He thanked them for the honour that had been conferred upon him, and would do his best to help forward the object they all had in view. He then proceeded to discuss in a very able manner the isochromatic plate and film questions, and he had come to the conclusion, after practical experience, that in many classes of work the isochromatic was of immense value. The discourse was profusely illustrated by means of negatives, prints, and lantern slides (shown by means of the Society's new electric lantern). Messrs. England, Edwards, Fitch, and Hardcastle lent various articles to make the subject practical. Dr. Rean (President of the Society) presented some beautiful interior prints on behalf of Mr. John Parnell, of Clapton. He also showed some paper negatives about thirty-five years old, and gave some silver prints to the Section over forty years of age. On Easter Monday the members purpose spending the day at Arundel.

Lewes Photographic Society.—Messrs. A. H. C. Corder and A. H. Webling gave a lantern entertainment descriptive of *A Holiday Tour in North Wales*. Several ladies were also present. The slides were almost entirely the original work of these gentlemen, and were of remarkable beauty, both as regards choice of subject and excellence of work. The "tour" started at the fine old city of Chester, some admirable views of the ancient towers, city walls, and the cathedral being shown. The trip up the river Dee was next graphically described, and a charming view of Ecclesdon Church thrown on the screen. The journey was continued through the beautiful Vale of Llangollen, of which several exquisite pictures of the canal and its numerous bridges were exhibited. Bettwys-y-Coed was the next centre of operations, a series of pictures from this lovely spot up the river Llugwy, as far as Capel Curig, and views of Snowdon being passed through the lantern. An excursion was then made in the opposite direction, up the river Conway, the Fairy Glen, and some of the wild and picturesque ravines on the river Lleder. The tour ceased at the historic town of Conway, its fine old castle and other interesting scenes being thrown on the screen. A most interesting and up-to-date series of views were next given of the wreck of the *Eider*, after which a set of coloured views, by Messrs. G. W. Wilson & Co., of Aberdeen, illustrating the cathedrals of England and Wales, were exhibited. The result of the Quarterly Competition was made known at this meeting. The certificate was offered for the best photograph of "leafless tree or trees." Mr. Andrew Pringle judged the work sent in, and awarded the prize to Mr. H. B. Constable, who sent in two subjects, which were placed first and second. At the June meeting Mr. E. J. Bedford will speak of *Perspective as applied to Photography: The Use and Abuse of Wide-Angle Lenses*.

Rotherham Photographic Society.—April 5, was more than ordinarily interesting. Dr. Baldwin (President) occupied the chair.—Mr. J. LEADBEATER, the Treasurer, gave an explanation and demonstration of the wet-plate or collodion process. He remarked that, as an amateur of thirty-five years' standing, he often looked back regretfully to the infancy of his acquaintance with the art of photography, when it was surrounded by a mysterious halo of wonder and expectation. The process was still thought by many photographers to give better results than any other method, and to his mind there was a brilliancy and transparency in collodion plates not to be found in gelatine plates. On this account it was largely used in making lantern slides. It had its disadvantages, however, which had led to its general abandonment for landscape work, the chief being the coating, sensitising, and developing of the plates in the field, an operation which necessitated the carrying about of a large tent, chemicals, bath, water, &c. Allusion was made to the numerous ingenious methods adopted to preserve the plate after sensitising, and some amusing ex-

periences given of the exposures which were necessary. The other business included the distribution of samples of Jacoby's collodion paper, and of several trade catalogues. *Hand Cameras* is the subject for the next meeting.

Sheffield Photographic Society.—April 5, Mr. B. J. Taylor in the chair.—Mr. T. G. Hibbert introduced Messrs. G. Houghton & Son's Shuttle hand camera, for which are claimed several advantages over all existing cameras, after which Mr. G. BROMLEY gave the second half of his subject, *Stereoscope Pictures*, in a lucid manner, which caused a great amount of practical discussion, and elicited a deal of useful information for the worker in stereoscopic slides.

Edinburgh Photographic Society.—April 6, the President (Mr. Hippolyte J. Blanc, A.R.S.A.) occupied the chair.—A paper was read by Mr. SYDNEY KEITH, entitled *A Holiday in Yorkshire*, in which he described his rambles, and showed a number of slides from the negatives he had secured. They were of fine quality, and much admired. Thereafter four new members were balloted for and admitted. In consequence of the increasing number of lantern slides, and the interest displayed in their production, it was resolved that the Council make arrangements for a special lantern section to take charge of their exhibition from time to time, and to form and establish a loan and exchange collection, and also to draw up a set of bye-laws for the regulation of this department of the Society's business. The President, in drawing attention to the forthcoming annual meeting of the Photographic Convention, which is to be held in Edinburgh in the week commencing July 11 next, said they would be glad to hear that all the necessary arrangements were progressing favourably, and that its members, coming from all parts of the country, might depend upon receiving a right hearty welcome to the city, and that the Society would do their utmost to make the occasion a cheerful and memorable, as well as a progressive, one. The presentation print for the year—which had again been reproduced by Mr. Balmain, with his usual skill and kindness—was then distributed to those present. It is entitled *Idle Moments*, and is a fine specimen of photogravure. The President (Mr. Blanc), before the close of the proceedings, was congratulated on the honour which had been conferred upon him by the Royal Scottish Academy in appointing him one out of the large list of seventy nominated for the dignity of Associate of that body.

Glasgow Photographic Association.—April 7, Mr. William Lang, jun., F.C.S., presiding in the chair.—Two new members were elected. The discussion on Mr. J. C. Annan's paper, which was continued from last meeting, was concluded, and afterwards a paper was read by Mr. LANG on *Robert Hunt and his Photographic Work*. Prints from negatives taken with Dallmeyer's tele-photo lens were the subject of much interest.

Photographic Society of Japan.—February 29, Mr. Kajima Sebi in the chair.—The following gentlemen were unanimously elected members of the Society:—Count Toda, Viscount Sagara, Messrs. A. D. Charlton, A. Rogers, F. W. Gotch, Y. Takayasu, and I. Tanabe. After this there was a Lantern Meeting, a large number of slides from work done by members during the past year being shown by a limelight lantern. The slides were all good, the large collection of the Chairman's itself, which was of the highest quality, being enough to have made an excellent show. There was a fair attendance, and all who were present showed great appreciation of the exhibition. Indeed, it was declared the best thing of the kind that had been seen by any person in this country. Mr. EDMOND R. HOLMES expressed the opinion that such an exhibition would draw a large audience in Yokohama, and suggested that it be repeated there. The proposition was received with satisfaction, and the Committee promised to make arrangements accordingly. By an unfortunate mistake, a set of slides, that it was thought would be particularly interesting—a set of Korean views by Mr. T. Hayashi, of the Japanese Legation in that country—arrived too late to be shown. These, however, and a number of other additional interesting slides will be available for the Yokohama Exhibition, the date of which will be duly announced in these columns.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

STEREOSCOPIC PHOTOGRAPHY.

To the EDITOR.

SIR,—I have read Mr. Chadwick's criticism of my paper in your columns. I endeavoured to show that stereoscopic photographs have no value from an artistic standpoint. Mr. Chadwick says he considers poetry and art in photographs nonsense, and then endeavours to prove that these are possible even in stereoscopic photographs. His great argument, which he thinks incontrovertible, is that they find favour with most of his friends and the public generally at present. If this is to be the final court of appeal, I give in at once.—I am, yours, &c.,

Fine Art Galleries, 153, Sauchiehall-street, J. CRAIG ANNAN.
Glasgow, April 11, 1892.

DEVELOPMENT SHOWN ON THE SCREEN.

To the EDITOR.

SIR,—I see a paragraph on the above in the JOURNAL referred to as if something new. I did this experiment in our village school, seven or eight years ago, to a public audience, and several times since in private.

I proceed as follows: I have ready-exposed a gelatino-chloride plate. Into an ordinary alum trough I pour the ferrous oxalate solution, and place the exposed plate in it, film-side to the light. The plate is held by a short wooden wedge against the side of the trough, so that the developing solution is between the light and the film.

When development is complete, pour off the developer and replace with hypo.

The lantern should be placed so that the picture is not more than three feet long, as the developer cuts off a lot of the light. A portrait with great contrast from a hand negative is most effective.—I am, yours, &c., H. G. M. CONYBEARE.

The Hut, Ingatestone, April 11, 1892.

MODIFYING LENSES.

To the EDITOR.

SIR,—In the JOURNAL of March 18, in the article entitled "Elementary Notes on Photographic Lenses," the formula given for finding the focus of the lenses when combined was $\frac{A+B}{A+B-C}$, A and B representing the length of focus of each lens respectively, and C the distance apart in the mount. If this is correct, the focus cannot be more than one and a fraction. Should not the formula read $\frac{A \times B}{A+B-C}$? I have always understood it to do so.—I am, yours, &c., GEORGE C. PILE.

April, 1892.

"PHOTOGRAPHIC PORTRAITS."

To the EDITOR.

SIR,—While I agree with your correspondent, Mr. A. Maskell, that the attack in your optical contemporary upon him and his friends is both virulent and intemperate, I should like to point out that, regrettable as it may be, it is an ultimate and inevitable form of rejoinder to the heap of ridicule which the school of Fuzzitypists has, I think, with undue haste, sought to cast at the old style of photography. It is to the interest of the paper named and those associated with it to maintain that old style. Mr. Maskell and his friends have, for years past, not only assailed the artistic attributes of that style, but now they are running dangerously near to telling the world that the highly finished tools of the optician are of no further use to the modern impressionistic photographer, and what is more, they are proving the faith within them by making pictures which, while they make the judicious among opticians grieve, also provokes their trade organ to take refuge in personalities in defence of its supporters. For, did not Mr. Maskell himself show us last year what could be done with a spectacle lens (and a pretty picture it was), and cannot he now discover one of the causes of the denunciation he and his friends have been subjected to?

For the photographers of the old school, however, who think—and rightly think—that a photographic objective is a necessary adjunct to successful and discriminating landscape photography there is one consolation in the knowledge that, if a lens is of no importance in taking pictures of the new kind, the need as well as the possession of brains is about on the same plane, and thus "no lens," "no brains" will be the mark by which the new school can in future be distinguished.—I am, yours, &c.,

April 12, 1892. CHANCE BROWN, JUN.

CAN PRINTING-OUT CHLORIDE PAPER BE DEVELOPED?

To the EDITOR.

SIR,—I think it would be of advantage if the new emulsion papers which I, among many others, am using could be developed as well as printed out. Are they sensitive enough to receive a latent impression with an exposure of a few minutes to daylight? If so, it would be an advantage to be able to take a number of prints quickly at will in the daytime and develop at night.—I am, yours, &c.,

Hammersmith, April 11, 1892. COLLODIO CHLORIDE.

[See leader on the subject in another part of the JOURNAL.—ED.]

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Backgrounds, one exterior and one interior, good as new, for exchange for two others, must be size 8×7.—Address, T. HAYWARD, Devizes.

Splendid oil painting, seascape, 24×12, worth 3*l.* when framed; exchange for good 12×10 camera or studio accessories.—Address, WILLIAM HARE, Photographer, Sutton, Surrey.

Large washing tank, with pipe and tap, in good condition; will exchange for studio accessories. Also, splendid whole-plate shepherd portrait lens; will exchange cabinet.—Address, S. J. GANNON, Chelmsford.

I will exchange a 12×10 camera and single slide, by Ottewill, and tripod, for a modern half-plate camera with three double slides and tripod; also two interior backgrounds and Tylar's print washer, for exterior or clouded backgrounds.—Address, FRED. C. D. HURD, Shepton Mallet.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to "*THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to "*HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

F. Hoare, Cirencester.—*Collection of Foreign and Ancient Silver Plate in the South Kensington Museum.*

L. SEAL.—All nitrates are easily soluble in water.

RUETAMA.—Clearly, if the price of metallic silver recedes, the cost of its salts are also reduced.

VOLUME.—By quantitative analysis, which you will find explained in manuals devoted to the subject.

ZINCO.—The blocks are usually cut to size with a circular saw, and the edges bevelled with a metal plane.

FLASHLIGHT.—Aluminium was meant. We have not yet heard of any experiments with it in this country.

E. DOYLE.—We have forwarded the letter. Any firm undertaking the silvering of glass will execute such a commission.

E. C. E.—The matter was well ventilated in our columns last year; besides, the purpose of your letter is not clear.

TRAWLER.—The spots are apparently due to particles of some pernicious matter coming in contact with the prints while they were, presumably, in a moist condition.

E. J. LESTER.—Mr. J. Barker's formula for gelatino-chloride, for printing out, given at p. 786 of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1892, is what you require.

W. GASKELL.—In all probability a kallitype print is as liable to be affected by a mount containing hypo, or other injurious substances, as an ordinary silver print, particularly in the moist state.

C. BOYD.—The platinotype prints forwarded have been made on paper that has become more or less damp by exposure to moisture. There is no way of improving the prints now.

R. A. B. asks if paste made with pure rice flour would be better than the best starch for mounting photographs with.—If the starch be good, there would be no advantage gained by using the rice paste; indeed, it might be the other way about.

DUDLEY TOWERS.—We do not think your neighbours can interfere with the glass-house; but, as it does not conform to the conditions of the Building Act, the District Surveyor has the power to order its removal. Better with dark-blue and light-green blinds.

TONES.—The reason for your failure to "successfully employ the solution recommended by Mr. Haddon for reducing purposes" is apparent from the particulars contained in your letter. You have been using potassium ferrocyanide instead of the ferricyanide.

F. (Cape Town).—If mounts printed with a bronze powder that causes spots on the prints be used, and the mounting be done with decomposed starch paste, the effect shown on the enclosed print is fully accounted for. Of course, we cannot say in what state the mountant was at the time it was used.

PLUMBER.—Brush over the zinc with a solution of one part each of chloride of copper, nitrate of copper, and chloride of ammonium in sixty-four parts of water, and add to the mixture one part of hydrochloric acid. Allow to stand for a day after this application. Paint applied to this surface will adhere tenaciously.

PALGRAVE.—The formula for transfer ink referred to is that, we believe used, at the Ordnance Survey Office. But we advise you to purchase the photo transfer ink supplied by the dealers, instead of attempting to compound it for yourself. The operations are troublesome, messy, and not always successful in the hands of a novice.

N. BEDWELL.—The quickest way to dry a gelatine negative is to immerse it for a few minutes in two or three changes of strong methylated spirit. Then it may be dried before the fire, or in the sun. A collodion negative, whether bath or emulsion, can be dried at once before the fire immediately it is washed. Heat does not affect the collodion as it does gelatine.

C. E. W.—Supposing you were the first to register a photograph of the boat race, you cannot prevent any one from publishing any photograph they may have taken whether before or after yours was exposed. Your smart work is so much labour lost. All you have secured is the copyright in your own picture. Surely you did not expect to secure any copyright in the boat race?

SEPTIMUS.—As your experience with the lantern extends only to the use of an oil lamp, we should not recommend you to commence the limelight with a mixed jet. A "blow-through" is much safer in the hands of a beginner, and such a jet will yield a light that is ample for a private room, while, at the same time, it is quite enough for enlarging on bromide paper with a brief exposure.

G. VOSS wishes to know where thin rolled zinc is to be obtained, such as that employed for the tympans of lithographic presses when they are used for photo-lithography. Both zinc and brass tympans are supplied by all who supply lithographic presses and materials. The zinc may also be had from all dealers in sheet zinc, and the brass from any of the rolled metal warehouses in Clerkenwell.

MCDAWBER writes:—"Can you kindly inform me where I can obtain stout unbleached sheeting, eight feet wide, for backgrounds? I have tried 'Horrocks,' of Manchester, and all drapers say they cannot obtain it. Is it specially made for the purpose? I can get the width in very thin bleached sheeting (more like a handkerchief than anything else), which is, of course, useless for the purpose. If you can inform me in your next issue, I should be very grateful. It is in every-day use in London, and no doubt you can give me an address where I can obtain it."—Perhaps some of our readers can supply the desired information.

H. E. THOMAS says he has recently bought a large rolling press, second hand, and the steel plate is very rusty from its having been kept for several years in a damp room out of use. He wants to know how he can repolish it so as to make it at bright as new?—If the plate is in the state we surmise it is, the most economical plan will be to discard it altogether, and buy a new one. To resurface the plate the usual plan is to work it first with snake stone and water, next with the stone and oil. Then, when a perfectly even surface is obtained, it is polished with a stick of charcoal and oil, and finally with an "oil rubber." To remove all traces of deep oxidation from a steel plate is a long and tedious operation.

OPTIC writes: "Would you please answer the following query in your next issue?—Can a photographer who has simply been a junior assistant in a firm that has been patronised by Royalty exhibit over his front, very prominently, 'Photographer to the Queen,' having, in very small letters, the name of the firm in whose employ he has been? What steps can be taken to get him to remove the said advertisement, which conveys a false impression?"—As the photographer has the name of the firm with whom he was with in small letters, he is within his rights; but he must not use the name in such a way as to lead people to believe that the business belongs to the firm, and this, it appears, he has not done. Unless he holds the Royal warrant, he is not entitled to style himself "Photographer to the Queen."

F. BAXTER writes: "Wishing to obtain a view of a small historical village amongst some hills in South Wales, I exposed two plates with the following results:—No. 1 plate was exposed on a level with the village, and developed all right, being a very good negative indeed. No. 2 plate was exposed from the side of a mountain 800 feet above the level of same village, and something like a quarter of a mile away. I may say the plates were from the same maker, and both exposures exactly the same, within half hours of each other, and yet the No. 2 plate was unmistakably a case of over-exposure to a great extent. Will you please venture an opinion as to the probable cause, as I fancy being in so elevated a position, and looking down upon the village, has something to do with it?"—The "probable cause" was undoubtedly over-exposure and atmospheric perspective, which would have prevented a brilliant picture being obtained even with a shorter exposure.

WE understand that several of the London photographic dealers' premises will be closed from Thursday night until Tuesday morning next.

WE are sorry to learn of the death of Mr. William Priestley, of the firm of Priestley & Sons, photographers, Egremont, Cheshire, which took place on the 8th instant.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—April 21, *Photography and Crime.* Dr. Jeserich's paper, illustrated by slides, also Indian and Colonial slides. 28, *The New Platinotype Paper,* Mr. W. H. Smith.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—Fixtures for April, 1892:—April 18, Excursion to Canterbury. 20, *Demonstration of the New Cold-Bath Platinum Process,* by Mr. F. W. Edwards. 23, Outing to Dulwich village and Dulwich College.

MESSRS. L. TRAPP & Co. write: "In your issue of March 25, 1892, there is an article on the 'acid action of drawing-paper of different makes,' by Mr. W. N. Hartley, F.R.S. Kindly take note that we are the sole agents for the drawing-papers of Messrs. H. A. Schöller & Sons, of Düren, who guarantee their paper to be free from acid."

MR. M. L. ISAACS writes us that, in consequence of the dissolution between himself and his late partner, he will continue, as from the 1st of January last, to carry on the business of Joseph Levi & Co., Furnival-street, wholesale opticians and dealers in photographic apparatus and materials, at the same address, and in the same manner, as he has done for the last sixteen years, during which time he has been the sole managing partner.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN, EXHIBITION, 1892.—The Exhibition will be inaugurated by a conversazione, open to members and their friends and exhibitors, at 8 p.m., on Saturday evening, September 24. The Exhibition will remain open daily, from Monday, September 26, until Thursday, November 10. Medals will be placed at the disposal of the Judges for artistic, scientific, and technical excellence of photographs, lantern slides, transparencies, and apparatus. Blank entry forms, and any further information respecting the Exhibition, apparatus, and lantern slides can be obtained from the Assistant Secretary, 50, Great Russell-street, London, W.C.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1668. Vol. XXXIX.—APRIL 22, 1892.

THE DEBT OF ART-PHOTOGRAPHY TO SCIENCE.

One of the papers read at the late Camera Club Conference was largely devoted to the strange contention that science was doing "serious harm to photography as a picture-producing art." In support of that contention, however, no more formidable piece of evidence was produced than that "when a student ought to be studying the construction of a picture, and developing in his soul the art of lying, he is led away by the flickering *ignis fatuus* of science, and goes mad over developers." We would not give much, either for the mental equilibrium or the chances of success of the picture-making student who, when engaged in studying the construction of a picture, cannot keep his thoughts away from such a subsidiary and relatively unimportant matter as the choice or composition of the developer he is going to employ. We prefer, however, to regard the remark, together with many more of a similar cast that followed it, as a piece of grotesque and fanciful exaggeration. Nevertheless, exaggeration or not, there underlies this and similar utterances of those to whom the picture-making possibilities of photography are all-in-all, such a state of misconception, if not ignorance, as to the extent to which art-photography is indebted to science, not merely for the means, but in some respects for the methods which it places in their hands, that, in justice to photographic science, we seize the occasion to remind our artist friends that they are in danger of belittling the depth, as well as the area, of their indebtedness.

However delightful, from an æsthetic point of view, a photograph may be, it relies for its charm and beauty, outside its selection and composition, entirely upon scientific aid. If, to take a common and obvious example, portions of the picture at its margins embrace perpendicular lines, their true perspective representation relies wholly upon the skill of the optician in providing a lens which will correctly translate those parts of the picture. Even the most advanced among the new school of photographers would hesitate, we should hope, to rate any kind of distortion in a photograph, as of little artistic account. Omitting landscapes pure and simple as being for the moment out of the question, the most beautiful interiors and those subjects having figure compositions with interiors, which are and have been so popular, would be impossible but for this property of photographic lenses. Despite the strenuous teaching and examples of the new school we have referred to, a large proportion of people of cultivated taste still find much, if not most, to admire in well-defined photographs of whatever kind which owe their dominant property in a primary degree to optical skill, a property which we have yet to learn is incompatible with the observance of the strictest art canons.

Science, indeed, has "more to do with art, except to provide materials for its use," than is allowed, because—and here we confine ourselves to photographic art alone—it is the man of science who usually first teaches the photographer what varied and pleasing effects are to be obtained from the use of the materials he provides. Was it the artist-photographer who was the first to discover the merits or adaptabilities of—let us say, for example—a printing process, such as platinum printing, to certain subjects? Assuredly not. Again, to whom are all the artist-photographers indebted for the wealth and variety of tones which may be obtained on this and similar surfaces? Clearly not to themselves. By whom has the art of developing the negative been reduced to such a degree of simplicity as well as reach of effectiveness? Not the "artists." By whom has the modern gelatine plate been perfected? Who is it that has wrought out its wonderful possibilities in rendering the fine details of a view, its delicate lights and shades, its deepest shadows, its highest brilliancies? The man of science.

It is not far short of the truth to say that the greater number of modern art-photographers have been educated up to the use of the materials which men of science have provided for them by the men of science themselves. It is the man of science, using its term in its purer, if more general, sense, to whom photographic truth or untruth is referable for distinction, a point which we are glad to see Captain Abney did not miss in his remarks at the Conference. We were also pleased to observe that he pointed out that artists' perspective had improved owing to the truth of photography, a truth which is the emanation of scientific effort.

Photography is in the position, unlike painting, that it relies very greatly upon the materials provided for its best and most delightful effects, as well as for the means and method of securing them, upon scientific aid, and we believe it will continue to be the case, while the lens, the dry plate, and the printing surface are factors in the production of photographs. In photography to-day effects are produced which were beyond reach a generation ago. Is this due to the advancement of art knowledge? Partly, if you like, but not solely; the man of science has had much, very much, to do with it. We fear that it would not be difficult for us to prove that the present rage for warm and sepia tones—which are allowed to fulfil current artistic requirements so admirably—is due to the experiments of the men of science, and not of the artists themselves. By-and-by, maybe, those tones will undergo modification, and we are sure that, if they do, science will once more lead the way.

There is, we fear, a decided tendency among art-photographers to underrate the value and importance of the tools with which they work, and, more, to overlook the fact that it is often due to the men of science that they have been taught how to use them. This is a form of ingratitude possibly arising out of the elation caused by the knowledge that as a picture

making art photography is slowly but surely edging in among her elder sisters. We sincerely hope it will not be perpetuated, and in saying so much we do not seek to undervalue the high art knowledge and instincts which fortunately prevail among so many modern photographers, be they self-styled artists or not. But "Art," it appears to us, is in danger of securing all the halfpence, while to Science are only allotted the kicks. We must change all that.

RECOVERING SILVER FROM SPOILT PLATES.

Most of us, whether amateur or professional, and especially if of an experimental turn, find ourselves, in the course of twelve months, saddled with a considerable stock of "waste glass," or, in other words, spoilt plates, or plates which, after development, are of no value as negatives. It may be in many, perhaps the majority of, cases that the glass itself is of no value for recoating, for the simple reason that we are not in the habit of making plates, and at present, so far as we are aware, there is no market for such waste, which therefore soon becomes a nuisance from the difficulty of getting rid of it.

But, at any rate, the silver contained in the films, especially if they be unfixed, has a value, and the trouble of recovering and utilising it is far less if systematically taken in hand than most photographers imagine. Of course, much will depend upon the method adopted as to whether the return is proportionate to the trouble expended; but, even without having recourse to any very special arrangements to that end, the recovery of the metal is, in a small way, decidedly remunerative.

In order to attain the most satisfactory result it will, of course, be desirable to work in a methodical or systematic way from the first. For instance, under or over-exposed or fogged plates that are clearly of no use should be washed and set aside without fixing; broken or "light-struck" plates or others that for any reason whatever are not submitted to the ordeal of development will, of course, be set aside without any further treatment, because, though the silver may be extracted from them by means of the fixing bath, the plan we are about to describe is, in our opinion, a superior one. Experimental films that have been developed and fixed and have served their purpose, or old negatives that are done with, although not so rich in silver as those that are unfixed, still contain a proportion of metal that is worth recovering, and these may therefore be included with the rest, and set aside until a convenient time arrives to treat the whole lot.

The first step is, of course, the removal of the films from the glass or other support, and here we may say that in the case of glass plates the glass itself acquires a higher value and begins to assume the character of a saleable or utilisable bye-product when it is freed from its coating of gelatine and brought to a state of tolerable cleanness. As regards celluloid and paper films, the removal of the gelatine is not so easy a matter as with glass, and it is perhaps a question whether, except in the case of perfectly soluble films, the game of recovery is worth the candle. The gelatine can scarcely be scraped off, and the only alternative, the use of boiling water or hot dilute acid, will disintegrate the paper support, reducing it to pulp, which mixes with the insoluble silver salt, and partially so also in the case of celluloid, which in any case is spoilt for future use owing to the destruction of its flatness.

The hot-water method is objectionable too, even with glass plates, on account of the quantity that has to be used. A mere soaking in warm, or even hot, water will not suffice to remove the film from a developed plate, owing to the well known "tanning" action of the developer upon the gelatine; and even those that have not been developed so frequently contain alum in some form that the gelatine is only partially softened by the hottest water. Boiling in dilute acid or alkali, or even long immersion at a normal temperature, will, of course, dissolve off the films, but the mass of liquid that then has to be manipulated renders the process an inconvenient one in the highest degree. We are therefore strongly in favour of removing the film by mechanical means, which, while just as easy, reduces the residues to a convenient and workable form.

For the purpose of cleaning off the gelatine, the plates are first of all placed to soak in cold or tepid water, heat being preferably avoided. When thoroughly soaked for, say, at least an hour or two, many makes of film, especially if developed, will strip readily in a single sheet without any further treatment; but, if the water in which they are soaked be acidified with citric acid, the stripping is reduced almost to a certainty. It then remains only to loosen the edges of the film by a rubbing or pulling motion of the finger, and the whole film will come away, leaving the glass almost clean enough to be recoated.

Where, however, this treatment does not answer, a flat board must be provided, along one edge of which is nailed a thin fillet or strip of wood against which to rest the glass; also a strip of hard wood with a sharp-planed edge to act as a scraper. The filleted board is placed in a sloping position on the sink, with the fillet end furthest away from the operator, and, one of the soaked plates being laid upon it, one or two strokes of the scraper, steadily and firmly applied, will remove the whole of the film in far less time than it takes to describe the process. A large number of plates may be treated in an hour, and the jelly collected for the next operation, which consists in eliminating the gelatine.

For this purpose there is a choice of two methods, namely, boiling either with dilute acid or alkali, either of which destroys the gelatine, both as regards its setting power and its power of holding the silver in suspension. But the result differs in the two cases; boiling with acid separates the silver in the form of unaltered haloid—whether it be bromide, chloride, or iodide—whereas the action of the alkali, in conjunction with the decomposed gelatine, reduces it to the metallic state. At first sight the latter would seem to be out-and-out the better plan to adopt, as it saves the reduction of the haloid by a separate operation; but, in practice, the trouble of freeing the precipitate of finely divided silver from the dark, dirty solution that clings to it with the greatest pertinacity robs the process of its simplicity, at any rate in inexperienced hands. Probably a purer result would be arrived at by this method than by the alternative one we shall describe, where *great* purity of the silver is desirable, but it would require the care and skill of an experienced chemist.

The acid method is therefore the one we shall recommend, and for the purpose almost any acid might be used, though in practice sulphuric or hydrochloric is much to be preferred. Such at least would be the case if the residues to be treated consisted solely of undeveloped film, in which case the whole of the silver would be in the haloid form. But with mixed residues the precipitate would consist partly of metallic silver, which, by boiling with sulphuric acid, would be liable to conversion into soluble silver sulphate, which would be lost, while in the case of hydrochloric, except by very prolonged boiling, it would be only partially converted into silver chloride.

We therefore prefer to rely upon a mixture of chromic and hydrochloric acids, which, while acting even more energetically upon the gelatine, also effectually converts the metallic silver into chloride. The solution may be formed by dissolving a quantity of potassium bichromate in water, and adding thereto hydrochloric acid. The exact strength is quite immaterial; but, as both the ingredients are cheap enough, it will save time and trouble to make it tolerably active, using about an ounce of each to a quart of water. The scraped-off films are placed in a suitable-sized porcelain basin, an earthen pipkin, or an enamelled iron saucepan, with sufficient of the acid solution to cover them, and brought rapidly to the boil, the mass being well stirred until the gelatine is quite dissolved. Probably by the time this occurs the setting power will have been destroyed, but the liquid will still retain a certain viscosity, which would prevent the ready precipitation of the silver; some time should also be allowed for the conversion of the metallic silver into chloride. The mixture will at first exhibit a dirty grey colour, varying in depth according to the proportion of developed and undeveloped bromide it contains, but as the action of the acid proceeds this will change to pure yellow. When this stage arrives remove the vessel from the fire, and when ebullition has ceased watch to see if there is a tendency on the part of the silver to settle quickly; if not, continue the boiling for a few minutes longer and repeat the test.

When the silver subsides readily, set the vessel on one side until the precipitate has settled well to the bottom, then carefully pour off the supernatant liquid and replace with fresh water, and again raise to the boiling point, stirring well. Repeat the subsidence and washing until the water comes away clear and colourless; then, in order to make doubly sure of the removal of all organic matters, boil once more with dilute hydrochloric acid (without the bichromate), and again wash the precipitate two or three times.

We have now reduced our silver to the state of mixed bromide and chloride, in which condition, however, it is of no practical utility, but requires conversion into the form of nitrate. The first step to this is to bring it to the metallic state, either by means of fusion or in the wet way by electro-chemical action. Fusion in the crucible with a suitable flux gives, of course, the purest result, but is not within the capabilities of most amateurs. The alternative method consists in covering the mass of silver haloid with water containing a little sulphuric or hydrochloric acid, and immersing a few scraps of zinc, iron, or copper, the two first being preferable, owing to the pertinacity with which the copper clings to the reduced silver. By the action of the acidulated water, the baser metal is dissolved with evolution of hydrogen, which in turn attacks the silver haloid, reducing it and forming hydrobromic and hydrochloric acids, which in turn react on a fresh portion of the zinc or iron, and so keep up a continuous action until the whole of the haloid is reduced, chloride and bromide of the baser metal then remaining in solution. Now, as both bromide and chloride of copper act powerfully on metallic silver, converting it into the corresponding haloid, it is obvious why that metal is not to be recommended for use, and possibly for the same reason zinc should be used in preference to iron.

In practice we prefer to use hydrochloric acid, as with it heat may be applied to hasten the reduction, whereas with sulphuric acid there is a danger, under such circumstances, of forming sulphate of silver. The quantity required is very small, a few drops in a quart of water will set up the action, though, of course, the greater the quantity used the greater its vigour. It is preferable to use granulated zinc—obtainable at any chemist's—as ordinary scrap zinc contains so many impurities.

As soon as the zinc is thrown on to the silver haloid, the latter begins to blacken where it is in contact with the metal, and this darkening spreads gradually until the whole mass is converted. If left quiescent, however, it would be a very long time before the action was complete, for which reason the mass should be frequently stirred, to bring fresh particles into contact with the zinc, and the action will be further hastened by the application of gentle heat. The progress of the conversion may be tested when the whole mass has assumed an apparently uniform black hue, by dissolving a small quantity of the precipitate—a few grains only—in warm dilute nitric acid, when, if no unreduced haloid remains undissolved, the process is complete. It will be some time after the apparent disappearance of unconverted haloid, however, before that result is gained.

It is highly desirable that the bromide and chloride be thoroughly converted, as, independent of the uncertainty and loss arising from only partial conversion, the presence of either of the haloids in the last operation, but especially chloride, will lead to the formation of an impure sample of silver nitrate, since they are both, to some extent, soluble in hot, strong solution of silver nitrate, and consequently form a double salt.

When the conversion is judged to be complete, separate the remaining fragments of zinc from the finely divided precipitate of silver. Here the advantage of using the granulated zinc will be appreciated, as scraps of thin sheet zinc frequently break up into minute fragments, which it is impossible to separate. Pour off the acid solution, and wash the precipitate in several changes of water, and then set it aside for some hours, or for as long a period as convenient, immersed in cold dilute sulphuric acid (one part of acid to ten of water) to dissolve any chance particles of zinc. Afterwards wash well, dry, and weigh.

To convert it into nitrate, to three parts by weight of the black powder add two of strong nitric acid and four of water, and place the containing vessel in a warm place where the fumes can escape conveniently; on the hob of the fireplace answers the purpose. When the silver is all dissolved, or the action has ceased, transfer the solution to a shallow dish or saucer, and place it in a warm situation to evaporate. A warm, not hot, oven will answer. The slower the evaporation the larger the crystals, and it should be borne in mind that in getting large crystals they may be withdrawn from the mother liquor, which will retain any excess of acid; whereas, if evaporated to dryness, the excess of acid will remain in the salt.

The silver nitrate obtained in this manner, if not analytically pure, is quite sufficiently so for all photographic purposes, and its preparation helps to rid the photographer of one of his minor troubles, the bugbear of otherwise useless waste plates.

The Chicago Exhibition.—It will be seen by the letter from Sir H. Trueman Wood, which we print elsewhere, that the effect of the Government increasing the grant for the British section at the forthcoming Chicago Exhibition enables the Commissioners to make a free offer of space to British exhibitors—a concession of which, we trust, photography and its allied interests will not fail to take the fullest possible advantage.

Silver Chloride in Vacuo.—In the discussion at the Physical Society on Mr. H. M. Elder's paper upon "A Thermo-

dynamical View of the Action of Light upon Silver Chloride," one speaker said he had been experimenting for years upon silver chloride, and he announced that he had found that no darkening whatever took place *in vacuo*. He considered oxygen necessary to the action. No doubt this was an independent discovery, but the speaker could not be very familiar with the literature of the subject, as the same fact has been published years ago.

Development Shown on the Screen.—We are pleased to have elicited the fact from a correspondent, Mr. H. G. M. Conybeare, that the experiment of exhibiting the development of a gelatine plate on the lantern screen has been demonstrated before the occasion to which we referred, a fortnight ago, as having taken place at a meeting of the Photo Club de Paris. In case any one should be inclined to repeat that experiment, the details which Mr. Conybeare has furnished will be of great interest and assistance. We note that in his experiments he employed the ferrous oxalate developer, which practically interposes a non-actinic screen between the light and the plate. When we passed our remarks on M. Molteni's experiment, we were presuming that a pyro or hydroquinone, and hence a colourless developer, was employed. Has Mr. Conybeare surmounted this difficulty?

The Life and Work of Mr. H. P. Robinson.—On Wednesday, April 13, Mr. C. W. Hastings delivered a lecture, illustrated by over eighty lantern slides, on the life and work of Mr. H. P. Robinson, in the course of which he said that, in the application of photography to art, Mr. Robinson had occupied a prominent position this last thirty years, and the products of his camera would hold their own beside the works of many painters of the present day. Without exaggeration, he might be called the uncrowned King of Photography. Mr. Robinson had always been a great exhibitor, and he (the speaker) was amused on asking, when on a visit to him, to see his medals, that about a hundred of them were brought down in a clothes-basket. A portrait of Mr. Robinson having been shown, his best-known works were passed in rapid succession on the screen. Each photograph told a story or suggested a happy thought, and the lecturer remarked that by Mr. Robinson's permission he was able to explain with respect to several combination pictures "how it was done." One picture of a seagull on the crest of a wave greatly puzzled the critics at its first appearance as to how the effect was produced. One of Mr. Robinson's finest medal pictures, *When the Day's Work is done*, had as a model an old man, who as a crossing-sweeper was formerly a familiar figure in Tunbridge Wells. Pictures depending on sky effects, landscape scenes, with figures introduced to form a story, were illustrated by examples, and a description of the *technique* given. The concluding picture, *Dawn and Sunset*, was, remarked the lecturer, one to linger over, as a high testimony to the possibilities of photography when handled by an artist.

Convention Slides.—The series of lantern slides shown at the meeting of the London and Provincial Photographic Association on April 14 are not only the work of two acknowledged masters of the beautiful art of lantern-slide making—Messrs. F. P. Cembrano, jun., and H. M. Hastings—but are also of interest from the fact that they form a record of many of the places visited during the Photographic Conventions of the United Kingdom, held respectively at Derby, Birmingham, Chester, and Bath. By the way, could not the series be completed by the addition of a selection of slides made from views taken during the gathering at Glasgow? It would be superfluous for us to deal out any praise of Messrs. Cembrano's and Hastings' slides, but we may, in addition to their pictorial and historical charm, point to them as a valuable advertisement for the Convention to be held at Edinburgh next July. We are convinced that, if photographers generally had a better idea of the opportunities for securing good pictures which these gatherings provided, in addition to more solid advantages, such as offering agreeable reunions of those who would not otherwise meet, as well as opportunities for taking part in the meetings, discussions, and other functions, the Conventions would be more largely attended than they are. Of that to be held at Edinburgh we are convinced the success is assured, inasmuch as in Mr. Cembrano the Convention has secured the services of a Secretary who is working with untiring energy. There is, perhaps, one drawback about these Convention slides, and that is their instigation of feelings of regret among those who are unable to participate in the pleasure of having visited such scenes; still, on the other hand, "'tis better to have seen the slides than never to have seen at all" the views and groups they represent.

The "Draper" Catalogue.—In a recent issue of the *Annals of the Astronomical Observatory of Harvard College* there is a full account of the "Preparation and Discussion of the Draper Catalogue," which includes a catalogue of 10,347 stars. It is pregnant with facts and information of great value to those who undertake astronomical photographic work, and contains much to interest the every-day photographer. It states that Dr. Huggins again took up the work, and, since 1879 has obtained a considerable number of photographs, "none of which, however, appear to show anything like the amount of detail now obtainable. In all these attempts the spectroscope was attached to the eye end of the telescope, so that the image of the star was formed in the slit, a cylindrical lens being interposed in order to give width to the spectrum. In the method which has been so pre-eminently successful the slit and collimator, which form an essential part of an ordinary spectroscope, was dispensed with, the rays from a star already possessing the necessary parallelism, and its image being almost a perfect slit without length. It is only necessary, therefore, to fix a prism in front of the objective of a telescope, and introduce some means of widening the spectrum, to obtain a complete stellar spectroscope. For eye observations the necessary width is obtained by the use of a cylindrical lens in conjunction with the eyepiece of the telescope. For photographic work the prisms are so arranged that the spectrum lies along a meridian, and it is then only necessary to allow the driving clock to be slightly in error to obtain a widened spectrum. The clock error must, of course, vary according to the magnitude and declination of the star. The great advantage of the slitless telescope depends upon the fact that every scrap of light passing through the object-glass is utilised; with the ordinary spectroscope it will seldom happen that all the light passes through the slit, and it is further reduced by absorption in the lenses and prisms of the spectroscope.

ON THE PRESERVATION AND DETERIORATION OF GELATINE NEGATIVES.

II.

In a previous article I referred to the appearance which the metallic silver present in the sky portion of a gelatine negative had when viewed with the aid of a microscope, and described the beautifully even manner in which this silver was incorporated with the gelatine when such was in a sound condition. No sooner, however, does decay, or some disturbing element, arise in the film than we find this beautifully even formation of metallic silver assuming quite a different appearance.

A very common form of deterioration is the formation of yellow transparent spots in the film, frequently not noticed until after the negative has been varnished and printed from, very likely in a damp atmosphere.

When such are examined under a good one-inch objective, it will at once be seen that the cause of the transparent appearance of these spots is brought about by the complete alteration of the original positions of the particles of silver. They are no longer found to be evenly deposited in the film, but are observed to have shifted into little clusters and rings. The metallic silver is still present, however, but not in the same beautifully distributed manner as formerly. A marked feature in a case of this kind is the formation of these tiny rings. It will be found, on close investigation, that the outer edge of the transparent spot is surrounded by a distinct metallic ring, and very frequently another of smaller dimensions, and somewhat deeper in the film, will be found inside the outer ring. For a long time I was puzzled to account for the formation of these spots and circles, and had an idea that they were caused by some electric action driving the metallic silver from a common centre into these rings; but one day, when minutely examining a spot of this description with the microscope, I was forcibly surprised to detect a distinctly effervescent action going on in the film, and this was evidently being brought about by the bursting of very minute globules that were being

rapidly formed. Here, then, was the solution of the difficulty. A pronounced decomposition was evidently going on in the gelatine, and the bursting of these tiny globules was driving the minute particles of silver outwards into the little rings and clusters I have referred to.

These spots are frequently met with in clusters, and they also frequently show the presence of very minute crystals after decomposition has set in, and these crystals are never visible until such has taken place.

It has been thought by some writers that these spots were caused by an imperfect fixation of the negative, but I rather think this is not the case. The evil which generally accrues from imperfect fixing is quite different, and takes the form of discoloured patches, not transparent spots, as in this case; but to this I shall allude later on.

The spots in question, I believe, are caused by an inherent disease or decay of the gelatine itself, and I am led to this belief by having clearly traced some of these spots to the surface of a gelatine plate previous to its exposure. When a plate having these spots is examined in a dark room by means of reflected light, there will be seen, on close inspection, dull matt markings on its surface. Sometimes these are very pronounced, and therefore easily noticed. At other times, when the plates have been but recently coated, they are only seen with difficulty; but, whenever they be present, depend upon it such will eventually lead into the deterioration now alluded to. Such plates may develop all right, and show no signs of these spots when looked through, but they sometimes do show when being looked down upon. When such negatives come to be printed in anything like a damp atmosphere, the flaws will soon make their presence felt in the manner described. I know of no treatment that will prevent them; it is a sort of cancer in the film.

I have referred somewhat to the deterioration arising from an imperfect fixing of the negative. Here, happily, we are not left in any doubt as to being able to distinguish such, and, of course, the cure is obvious. When a gelatine negative is imperfectly fixed, there will at first at least be no pitting of the film, and the discolouration will appear in broad, or some other distinct, form of patches, seldom or never appearing as spots; and this discolouration generally puts in an appearance promptly. Doubtless many a good negative has been spoiled by imperfect fixation, a fruitful source of which is the employment of an over-used fixing bath. All valuable negatives ought to be fixed in an absolutely new bath.

Another very annoying kind of deterioration is the surface stains, arising from the use of damp printing paper. Doubtless this form of flaw is well known to almost every worker. It is perhaps the most common of all printers' troubles. An appearance of such therefore need not be described; but, as prevention is at all times better than a cure, I would refer my readers to a certain kind of treatment which experienced workers claim to be an absolute protection against this form of deterioration.

This is the application to the film, whilst wet, of a water varnish. Such treatment was well known to many old collodion workers, and experience has shown that it is equally efficacious in the case of gelatine. Doubtless many amateurs of the present day never heard of such a thing as water varnish; and, as they are not likely to be able to buy such, perhaps I cannot do better than give them a formula for its production. It is very highly recommended by those quite competent to speak of its utility from having used it, one well-known worker (Mr. W. T. Wilkinson), whose formula I now give, asserting that he never knew of a case of silver staining when such was applied to a gelatine film.

Here is the way to make a useful quantity of this varnish. Take of shellac, in thin flakes, quarter of a pound, and water one pint. Place in a tin saucepan, or other suitable vessel, on a fire or over a gas-stove, and raise to boiling point. When this is reached, add a few drops of a hot saturated solution of borax, stirring vigorously with a glass rod until the shellac is all dissolved, which will be in a few seconds. Don't use too much borax, but add slowly, and stop short of complete solution rather than the other way. After this, filter through charcoal, and the water varnish is ready for use.

For gelatine negatives this varnish is applied after they are well washed and whilst still wet. This gives a good surface to retouch on when dried, and the film may afterwards be varnished with spirit, varnished in the usual manner. They are then said to be actually proof against such silver stains as are commonly met with. It has been claimed for this treatment that a gelatine film covered with this varnish, and dried, was placed on a shelf with a cotton-wool plug from a silver filtering funnel laid upon it; at the end of three days there were no signs of staining, although no spirit varnish had been applied.

Quite recently I had brought before my notice a case of deterioration, which is sometimes also wrongly attributed to imperfect fixation. In this case the negative, which had been varnished—and a very good sample of varnish had been used, too—appeared to present scales in the varnish, these resembling in a marked manner the appearance of the formation of crystals in the film. My friend was much concerned at this, and had quite made up his mind that this scaly appearance was caused by the negative not having received a thorough enough washing before being varnished. I told him he was not going to lose his negative just yet a while, seeing that all that was wrong was on the surface, and not in the film. The negative in question was placed into a bath of methylated spirit until all the varnish was removed. This left the film in as perfect a state as it was before being varnished.

This was clearly caused by the negative having got water thrown on its surface, and the varnish, being of a very hard kind, had really protected the film in this case. It would, therefore, appear that some kinds of varnish do really protect the films from moisture; but there are, doubtless, samples that are quite useless in this respect.

In my next, I hope to refer to deteriorations frequently met in with in negatives that have been intensified with mercury.

T. N. Armstrong.

RATIO OF GRADATION.

Since my last letter to The British Journal of Photography, I have greatly altered my opinions on several of the matters dealt with in Messrs. Hurter & Driffield's paper. I had previously felt much confidence in their "correct formula," but, having reconsidered the matter lately, I now feel considerable doubt in regard to it. That formula results from an attempt to explain the influence of exposure on a photographic plate by accounting for all the energy received. Of course, the light reflected, and that passing right through, can have no chemical action in the film; it is also shown that the light absorbed by particles of Ag Br, *after* being brought to a developable condition, has no further useful effect; and a formula is given showing what the degree of intensity is which remains, at any stage, after allowing for the light so wasted. The remainder, being what is absorbed by the still unchanged particles, is regarded by Messrs. Hurter & Driffield as all effective. The energy imparted by it is treated as being entirely utilised in attacking unchanged Ag Br, and no reference is made to the fact that a part of it will probably be lost in the form of heat, &c.; but still the argument would hold good if a *constant proportion* of the energy were so employed, not varying at any stage, until the particle attacked was fully saturated—if that is an allowable expression. Of this, however, we can have no proof. Still, if that point be granted, I think there is a further difficulty. Having found the formula showing the effective light after any exposure, Messrs. Hurter & Driffield suppose that that intensity, during an instant of time (dt), will change a certain number of particles (dx), that number being found by multiplying the formula of effective light by the factors dt and $\frac{1}{e}$, l being the amount of energy necessary to change one particle to a developable condition. Now, this would certainly be correct if the effective energy were all concentrated on the number of particles represented by dx; but, as a matter of fact, it is distributed among all the unchanged Ag Br in the film. On the other hand, all the particles contained in the film, after a period of exposure, are in a *partially* changed state—that is, all have absorbed more or less energy—so it may therefore sometimes occur that, during a part of the exposure, the number reaching the developable stage will happen to average about the same as would be the case if all the light were being used in fully changing previously unexposed material. During the earlier part of the exposure it, however, would certainly not be so.

It is from an equation depending on that doubtful value of dx that the "correct formula" is derived. By it the density which will result from any exposure is asserted to depend, always and only, on the length of development, the inertia of the emulsion, and the opacity of the undeveloped plate. The opacity is made a function, because it accounts for the light which passes right through the film, and is therefore lost; but it is not easy to see how that loss could make any difference to the smaller densities, where the changed silver is all at the top of the film. When the light has produced no change whatever in the lower layers, how could an increased quantity of Ag Br (and therefore greater opacity) underneath, have led to any difference in the developable density? The light passing out of the film has already proved too weak to make any change in the last part of the Ag Br it has passed through, and could therefore have made none in a still lower layer.

Feeling now much doubt as to the correctness of that formula, I tried to form some ideas as to what would result from considering the particles as all absorbing energy from the commencement of the exposure, and, after working the matter out a little, I was at length surprised to find that I had arrived at the *short formula* of Messrs. Hurter & Driffield. This formula had been discovered by means of experiments only, and it is therefore interesting to find a method of reasoning which appears to lead to the same result. We may consider the grains of Ag Br as quite independent of each other, all absorbing energy from the commencement of the exposure, and none reaching the developable stage, either sooner or later, in consequence of anything happening to other particles. If all were equal in sensitiveness and similarly situated, they would remain unaffected till a certain stage of the exposure, and then be all changed at the same instant, half-tones being impossible. Gradation, therefore, results from the unequal sensitiveness of the particles, and from the fact that those lying more deeply in the film receive a smaller intensity of light than those nearer the surface. Now, to find the principles resulting from this, it will be convenient to consider a simple case, and suppose a film in which the Ag Br is all of equal sensitiveness, and equally distributed through the thickness of the film. Representing the exposure by It (intensity × time) and the amount of exposure necessary to just bring the Ag Br to a developable condition by i (inertia), it is evident that the grains on the surface would be changed when $It=i$, and those in any position underneath when *they* received an equal amount of exposure. If the film were now regarded as consisting of a large number of thin equal layers, and each of these allowed $(1-a)$ of the light to pass through, the combined transparency at the nth would be, as shown by Messrs. Hurter & Driffield in the first part of their paper, $(1-a)^n$. Now, at a depth where $It(1-a)^n=i$, the Ag Br would be all changed, and also in all layers above, as each of them would have received a greater intensity of light than that, but not lower. Each layer, all being equal, would contain the same amount of silver, so that the whole amount changed would always be proportional to n. If we write ϵ^{-kn} in place of $(1-a)^n$, when $\epsilon^{-kn}=\frac{i}{It}$, n is always proportional to the amount of changed silver, and therefore answers to Messrs. Hurter & Driffield's definition of density (D). From the above equation it follows that $\epsilon^{kn}=\frac{It}{i}$, and $kn=\log_{\epsilon}\left(\frac{It}{i}\right)$. The coefficient of development—modulus to common logarithms—and $\frac{1}{k}$ may be combined in a constant, as γ, and $\log. i$, being also a constant, may be written as C. With these alterations the formula would read

$$D=\gamma\ (\log. It-C)$$

That, it will be noticed, is Messrs. Hurter & Driffield's *short formula*.

Now, as the *thickness* of the reduced silver—that is, the number of supposed layers—will always be exactly proportional to the amount of that silver, we have here exactly the conditions assumed by Messrs. Hurter & Driffield in showing that density is proportional to the logarithms of transparency. While discussing the matter recently, it never struck me that the silver might be so arranged in the *interior* of the film as to just agree with the conditions assumed, but it appears that in this case it would actually be so. Mr. Chapman Jones, in an article on intensification, some time ago expressed the opinion that the deposit varied in depth with the density, but I had previously, unjustly it appears, doubted the correctness of that view.

So far, the short formula seems altogether correct, but it has now to be considered whether it must be modified when the conditions I have stated are departed from. As regards the matter of even distribution of the grains through the thickness of the film, it is probable that in most commercial plates, as they are now usually machine-made and quickly set, there is not much inequality between the amounts of silver at different depths. When the distribution is *not* regular, the imagined layers may be considered as not necessarily of equal thickness, but always of the same transparency. Then, as we have supposed them very thin, and therefore of small opacity, I think it would follow, from the arguments given in my previous letters (supposing them correct), that in that case silver, which was producing equal opacity in layers which differed moderately in thickness, would be practically equal in amount in each of them, so that it seems unlikely that the truth of the formula would be much affected by that alteration of conditions. It must be remembered also that the silver would be reduced on development just in the position it occupied as Ag Br, so that in any case the resulting opacity in the negative would not be affected.

But a much more complicated question remains to be dealt with. The grains of Ag Br have been treated as being always of equal sensitiveness, while, as a matter of fact, they really vary greatly in that respect in all emulsions. The grains belonging to any particular grade of sensitiveness in an ordinary plate would, of course, become developable when the exposure was equal to the inertia of that grade, so that all would be reduced in each layer down to the nth when that received an exposure just equal to i, and it would follow, from the reasoning previously given, that the formula would apply to the silver of each separate degree of sensitiveness, but the constant C, being the logarithm of i, would have a different value for each. Taking two grades having logarithms of i equal to a and b respectively, their densities, after any exposure, would be $\gamma\ (\log. It-a)$ and $\gamma\ (\log. It-b)$, and the sum of the silver changed in both would be $2\gamma\left(\log. It-\frac{a+b}{2}\right)$ which, of course, is merely another form of the same formula, only the constants being changed. In the same way it may be shown that the formula would apply for any number of grades of sensitiveness, C representing the average of the logarithms of inertia of the whole. It is clear, however, that the formula, in cases of emulsions of mixed sensitiveness, can only apply while all the varieties are being acted upon, and in that fact I think we have an explanation of the periods of under-exposure and over-exposure found by Messrs. Hurter & Driffield. The action begins when the exposure first equals the inertia of the most rapid grade, and, if the plate contained no other kind, it would then proceed according to the formula; but, as exposure continues, inertias of other rapidities are reached, and continually change the value of C till that of the least sensitive is arrived at. Then the growth of density proceeds according to the formula, and the "period of correct exposure" begins. After a time the most sensitive form of Ag Br will become all changed, and after that, as grade after grade is exhausted, the densities will always be less than the formula would show, and we shall then have arrived at the stage of the period of over-exposure which continues till the action of reversal counterbalances any further increase of density due to still unchanged particles, and so the maximum of density is reached.

In the case of an emulsion containing Ag Br of varying degrees of sensitivenesss, it cannot be shown as clearly as in the simpler case that the conditions assumed by Messrs. Hurter & Driffield in showing that density equals the negative logarithms of transparency really exist; but, after carefully thinking the matter over, I have satisfied myself that that rule will still be practically correct under the altered conditions. I am, therefore, now convinced that Messrs. Hurter & Driffield have been quite right in depending on the truth of the formula D=log. O, which results from it. It has, so far, been taken for granted that the different grades of sensitiveness will always be in the same proportion to each other all through the film. Where that is not practically the case, I doubt whether the short formula, or any other, would apply; but it would probably be only in very inferior plates, if any, that that would be likely to be a doubtful matter.

If the views I have described are correct, it will appear that, in order to obtain exactly true gradations, the *ideal emulsion* should be prepared with Ag Br, in which the grains are all of equal sensitiveness. That such an emulsion would give technically perfect negatives may be shown without estimating the actual amount of Ag Br changed, for, on exposure, as I have shown, the silver would everywhere be brought into a developable condition to just that depth in the film where the varying intensities of the light acting are reduced, always, to one unit—*i.e.*, to the value of i. The transparencies of that changed silver would, in consequence, be such that, by reversing matters and passing light of uniform intensity through them, the intensities emerging would be in exactly inverse ratio to those which had produced the changed state. By developing to the proper stage, and fixing, we shall have exactly preserved those transparencies, and the result will, therefore, be a perfect negative, in which, as defined by Messrs. Hurter & Driffield, "the opacities of its gradations are proportional to the light reflected by those parts of the original which they represent." In plates prepared with such an emulsion there would be no periods of under-exposure or of over-exposure, but every gradation would be correctly rendered for all exposures, from that intensity which just equalled the inertia up to that giving the greatest density which the plates could register. Development might be made a purely mechanical operation by the method of first reducing the developable silver to the fullest possible extent, and then, after fixing, reconverting the reduced silver into Ag Br. The film would then be in exactly the same state as was that portion of it which brought all the varying intensities of the exposure to one level, and its transparencies would, therefore, all be just in inverse ratio to those intensities. The production of such an *ideal plate* is, of course, im-

possible, but by means of the "centrifugal separator" it does not appear unlikely that a near approach to it might be made.

According to the principles I have stated, it would appear that there need be no limit to the range of gradation if plates were sufficiently thickly coated, but the phenomenon of reversal, I think, fully accounts for the fact that a limit certainly exists. It would occupy too much space, however, to deal at present with that matter.

H. J. CHANNON.

TONING AND INTENSIFYING BY URANIUM SALTS.

[Society of Amateur Photographers of New York.]

THE method to colour or to intensify negatives by means of uranium salts is by no means a novelty in photography. It was practised in the earliest times of the collodion process, according to a formula by Selle, who prescribed a solution of ten grammes each of ferricyanide of potassium and uranyl nitrate in 100 c.c. of water.

After the collodion had been superseded by gelatine emulsion plates, Dr. Joseph Maria Eder revived Selle's process, modifying it to some extent, and we find it described in detail on page 82 of his book, *Modern Dry Plates*, translated by Baden-Pritchard in 1881. Soon after its publication, T. C. Roche and Charles Ehrmann exhibited uranium intensified positives and negatives before the Association of Operative Photographers of New York, and ever since gelatine positives and negatives, and later bromide prints and bromide transfers, have been toned or intensified in this manner.

Let us look superficially at the chemical process taking place when toning in this manner, with especial regard to the alleged improvement of it, and the perfect preservation of the whites in the high lights.

Uranyl salts are not precipitated by ferricyanide of potassium, the so-called red prussiate, but ferrocyanide of potassium, the yellow prussiate, does so. When ferricyanide of potassium comes into contact with the silver deposit of either negative or positive, the conditions of the two substances are changed, the ferric salt is reduced to the ferrous state, and a portion of the metallic silver is formed into ferrocyanide of silver. Then only an action of uranyl nitrate becomes possible, and in combining with the reduced, the ferrocyanide of potassium, the reddish brown precipitate we desire to obtain, the ferrocyanide of uranium, begins to form. The longer the silver deposit is subjected to the action of the solution, and the more concentrated this latter is, the more intense in colour will be the deposit.

Before reducing takes place, the not yet decomposed ferricyanide and the uranyl nitrate have ample opportunity to permeate the soft and porous gelatine film. It is one of the properties of the ferricyanide of potassium to harden or to tan gelatine; a consequence of which is that the decomposition products, as well as undecomposed portions of the salts, are closely enveloped within the film not removable by washing in pure water. The white of a positive impression remains yellow notwithstanding all means employed to prevent it.

But the prints we have seen, which were made before us, can justly boast of perfectly pure whites, without any tinge of yellow in the lights, and we are told the addition of acetic acid has wrought this wonderful and very interesting fact.

The making of uranium-toned prints with pure whites is also nothing new. It is not an American invention, as has been publicly announced, I believe; and, in fact, we find the process described in all newer handbooks of photography. A formula for it by Dr. E. Vogel appeared first in *Photographische Mittheilungen*. It is as follows:

Red prussiate solution, 2 : 100	50 c.c.
Uranyl nitrate solution, 1 : 100	50 ,,
Glacial acetic acid	12 ,,

How simple the toning is will be at once understood, and I cannot possibly imagine why so much noise has been made about it. We all know the properties of the chemicals we work with, and those that do not ought to. We knew all along of the tanning properties of ferricyanide of potassium, and those of acids to soften gelatine or destroy its viscosity, and the application of the one to counteract the other is the only thing creditable that I can see.

Photographic and photo-chemical novelties are floating in the atmosphere, as it were, waiting to be picked up by the first comer, as has been said by an old practitioner, and he is right in every sense of the word.

The method of toning and intensifying with uranyl nitrate can be very profitably employed in the making of transparencies for decorative work and for projection. An under-developed gelatine lantern slide may be intensified with it to perfection, gaining at the same time an agreeable and warmer tone. Failures in lantern-slide making are almost entirely out of the question when we press the red prussiate into our service. Under-developed slides we intensify by the method described, and over-exposed and over-developed plates, subjected to a process which I will describe on some other occasion, may be made into beautifully clear and detailed slides by applying Farmer's solution.

Let us now throw a glance at the process of intensifying negatives with uranyl nitrate, not applicable to all cases of improving feeble negatives, but eminently so to some. Under-exposed and under-developed negatives, unfit to print from on account of harshness in some, and weakness in other parts, may be made excellent printers with the uranium intensifier, as long as the negative is free from fog, and perfectly clear in the non-exposed portions of it. Of course, we must dispense in this case with the acetic acid. What is deleterious to the toning of a bromide print becomes here an important factor. The yellow tone assumed by the clear parts of the negative retards the too forcible printing of the shadows, and establishes a harmony between light and shades not attainable with mercurial intensifiers on negatives of the described character. The manipulation requires a little more than ordinary attention, but there is the one consolation, in case failures occur, that the whole uranium deposit can be removed by a weak solution of cyanide of potassium, and, after washing the plate, a new intensification be undertaken.

Uranium-intensified positives may be rendered blue by immersing the plate in a solution of ferrous sulphate, also a method of considerable age, but deserving the attention of our diligent amateurs.

CHARLES EHRMANN.

ON SOME POINTS RELATING TO DEVELOPMENT AND TO THE FORMATION OF THE LATENT IMAGE.

[Camera Club Journal.]

A VERY urgent request from the Hon. Secretary that I should contribute a paper to this Conference must serve as my excuse for bringing forward the results of some experiments that were made chiefly for my own information.

I do not propose to enter into the much-discussed question of the relation between exposure, gradation, and the method of development. Removal from Leeds to the south, and the consequent upsetting of my laboratory arrangements, has prevented me from making any strict experimental inquiry into the conclusions arrived at by Hurter & Driffield. It is to be regretted that their unfortunate use of the word density in a sense very different from that in which it is commonly used by photographers should have led to a great deal of misunderstanding. Further, I do not think it has been made sufficiently clear to the majority of photographers that the ratio of the densities, in Hurter & Driffield's sense, may remain constant, but the ratios of the opacities, which is what we have to consider for printing purposes, may vary enormously, according to the absolute values of the densities.

At present I regard the unalterability of gradation by development as not proven. It is extremely improbable that so many of the most experienced photographers would have become so strongly impressed with the idea that the gradations are to some extent modified by mode of development if the idea were entirely without foundation in fact. The matter requires further investigation. Recently (*Phot. Wochenblatt*, XVII. 305–308), R. Neuhauss has stated that he has obtained considerable variations by varying the concentration of the developer. He used a sensitometer screen with thirty squares of different degrees of opacity, and exposed plates behind it for a constant time at a constant distance from the source of light. A concentrated pyro-soda developer gave squares Nos. 1 to 6 quite opaque and not distinguishable from one another, and the opacity gradually fell off to No. 26, square No. 27 being scarcely recognisable. A precisely similar plate, developed for an hour and a half with the same developer diluted with fifty times its volume of water, gave no equal opacity in the first six squares, but No. 1 was distinguishable from No. 2, and, moreover, the last square of all, No. 30, was distinctly visible. In the second case, three squares, Nos. 28, 29, and 30, at one end of the scale, had a recognisable density, whilst in the first case they showed no visible deposit, and, on the other hand, the squares at the opposite end of the scale were less dense in the second case than in the first. This means, of course, a very considerable alteration in the relative densities, and, though the variation in the composition of the developer was greater than is usual in practice, the experiment is directly opposed to Hurter & Driffield's main conclusion. I have not yet had an opportunity of repeating the experiment, but a statement of this kind by such an experienced photographer as Neuhauss indicates that the question is still *gradations in developed positives*. An

important question of the same order is the possibility of altering, by development, the gradations of positive prints obtained on bromide paper. The experiments that I shall describe were made primarily for another purpose, but they throw some light on this question.

Paper from three different factories was exposed behind the same Warnerke sensitometer screen to a small screened gas flame of great constancy.* All the exposures were of the same duration. The paper was treated with the developer without being previously wetted, and, in order to assimilate the conditions as far as possible to those existing in actual practice, development was continued in each case until it seemed that the maximum possible amount of detail had been obtained, and the denser squares were becoming indistinguishable from one another. The results are given in tabular form. The term "gradations" is used to denote the number of squares differing in opacity, or, in other words, the range of tones. In almost all cases the first two or three squares shown were indistinguishable from one another in their degrees of blackness.

Experiment.	Oxalate Solution, 25 per cent.	Ferrous Sulphate Solution, 25 per cent.	Water.	Potassium Bromide, grains per ounce.	Ilford Slow Bromide.				Morgan & Kidd (rough surface).				Eastman.			
					Sensitometer Number.	Gradations.	Fog.	Colour of Image.	Sensitometer Number.	Gradations.	Fog.	Colour of Image.	Sensitometer Number.	Gradations.	Fog.	Colour of Image.
1	4 pts.	1 pt.	(first time)		23	18	Distinct	Cold	19	16	Much	Black				
2	4 „	1 „	(second time)		24	18	V. slight	„	20	16	„	„				
3	4 „	1 „	(third time)		23	17	Trace	„	17	13	Less	„				
4	6 „	1 „	...	...	23	17	Decided	„	17	14	Much	„				
5	8 „	1 „	...	...	23	17	„	„	15	13	„	„				
6	4 „	1 „	5 pts.	...	25	18	Trace	Black	19	15	„	„				
7	4 „	1 „	10 „	...	22	18	Decided	Brown black	11	8	Less	Warm black				
8	4 „	1 „	...	1	20	15	None	Black	22	22	Slight	Black	25	21	None	Cold
9	4 „	1 „	...	2	18	13	„	Cold	25	21	„	Warm black	17	13	„	Black
10	4 „	1 „	5 „	1	18	14	„	Black	16	16	„	Warm black	15	14	„	Warm black
11	4 „	1 „	5 „	2	15	11	„	Warm black	10	7	None	Brown	15	13	„	Black
12	8 „	1 „	...	2	15	11	„	Black	14	14	„	„				

When the same quantity of developer is used over and over again, the tendency to produce fog becomes less and less, and the gradation somewhat shorter. An increase in the proportion of oxalate distinctly increases the tendency to fog. Dilution with water has no marked influence on the gradations, but lengthens the time required for development, and gives an image with a warmer colour. Addition of bromide is very efficacious in preventing fog, but reduces the apparent sensitiveness of the paper, and shortens the gradations, its influence in this respect being more marked than the influence of dilution. The precise effect of any modification in the composition of the developer varies with the character of the paper.

The influence of bromides on development is a point of much interest, and has given rise to much discussion.

Experiments made in connexion with a standard method of development (*Phot. Journal*, April, 1890) showed that, with pyro-ammonia, proportions of ammonium bromide, varying from one and a quarter to five parts per 1000, have little effect on the time of development, and no appreciable effect on the apparent sensitiveness of the plates. The advantage of bromide lies chiefly in the prevention of chemical fog, both with ammonia and with sodium carbonate. Hurter & Driffield, in their first paper, arrived at a similar conclusion, and consider that the alkaline bromide prevents general fog by preventing the dissolution of silver bromide in the ammonia.

In order to ascertain whether ammonia solutions of the strength commonly used in developers do really dissolve an appreciable quantity of silver bromide from a gelatino-bromide plate, I broke up some plates (in the dark room) and placed the pieces in stoppered bottles containing ammonia solutions of various strengths, both with and without ammonium bromide. In 100 c.c. (A) contained 0·25 gramme of real ammonia NH_3, equivalent to about 0·75 gramme of ammonia solution 880; (B) the same with 0·25 gramme of ammonium bromide; (C) the same with 0·5 gramme of bromide; (D) 0·5 gramme of real ammonia; and (E) 1·0 gramme of real ammonia. After standing for forty-eight hours with frequent agitation, the liquid was poured off and tested for silver by addition of ammonium sulphide. A, B, and C contained no silver, D contained a mere trace, and E a distinct trace, but the quantities dissolved were so small that it is difficult to regard them as playing any important part in the production of fog. Moreover, comparatively small quantities of caustic soda will produce abundant fog, both with pyro and quinol, and there is no evidence that dilute solutions of caustic soda have any solvent action on silver bromide.

In a paper on *Chemical Changes from a Modern Point of View*, read at the Conference in 1889, I pointed out that the operation of developing must be considered from the point of view of chemical dynamics. It is well known that in many chemical changes the rate of change is affected by the quantity of the products of the change already present. Now, in alkaline development, the reduction of unexposed silver bromide by the developer would result in the formation of an alkaline bromide. If an alkaline bromide is previously added to the solution, the tendency to the formation of more bromide will be reduced, and hence the reduction of the silver bromide will be retarded, or, with a certain proportion of alkaline bromide, prevented altogether.

C. H. Bothamley, F.I.C., F.C.S.

* The standard flame that I use for exposures of this kind is extremely constant, and plates of the same kind, exposed for the same time and developed in the same way, always show the same sensitometer number.

PHOTOTYPES *VERSUS* PHOTOGRAVURES.

[Anthony's Photographic Bulletin.]

Let us first consider the ordinary half-tone photo-engraving, of which so much has lately been seen in the way of illustrations for the higher-class periodicals and works of an art and technical nature. We shall find that these prints all render the half-tone of the original, or, to be less technical, show the various degrees of light and shade, in masses of colour differing in degree, but in flat tints, produced by breaking the original subject, that may have been either a wash drawing, painting in colour, portrait from life, or view from nature, into an immense number of dots, obtained by photographing through the fine meshes of a ruled glass, in a manner not necessary of description here.

The resulting picture is transferred to the metal that is to serve as the finished plate; the chemical action is proceeded with, and the half-tone plate that results shows the picture in relief, and the entire surface of the plate, a mass of fine points, or dots, separated by fine furrows running in transverse directions, the points in relief being the printing surfaces. The plate being blocked on wood or metal to render it of the same height as type, it is inked up with a roller in the same manner that type is, and the ink, adhering to the points, is impressed into the paper that is brought in contact with them in the printing press. It should here be noted that, the points or dots making up the printing surface of the plate being all of the same height, the amount of ink deposited on the paper is of the same depth or thickness from each and every printing point, and it naturally follows that variations in the light and shade making up the picture are dependent on the number and size of such dots within a given radius; thus a heavy shadow in a picture printed from relief plate

will be seen to be composed of a large number of these dots, often so close together as to merge into one another, while the high lights are the result of a preponderance of the clear transverse lines, that serve to separate the dots more widely, only showing them sufficiently to give form and colour to their object.

The above are the principal points of identification of a print made from a half-tone type plate in relief, and are easily to be distinguished from pictures produced from intaglio plates, as will be shown further on. There is still another kind of half-tone relief, however, that is not so easily distinguished, and this is the photo-gelatine, or heliotype, and kindred processes, which, in rendering the gradations of colour, do not cut them up into dots, but lay the ink in smooth masses of different tones on the paper from a surface of gelatine. It is not the intention of this article to go into all the varying methods of printing in relief, but merely to contast as strongly as possible the wide difference between the rightful photogravure and the many cheap illustrations printed in a type press that have so frequently been foisted on an unsuspecting public under the guise of such.

The photogravure is printed from an intaglio plate, and is not capable of being used in a type press under any conditions. It can only be successfully printed by an expert, and where, with a relief plate, the office boy might "kick off" say, a 1000 a day, or the steam cylinder press 10,000, the expert printer, with his intaglio plate, would not produce above 200 good impressions. The intaglio plate is filled while warmed with a hard, stiff ink, which is pressed into every depression, and after the high lights of the plate are carefully "wiped off," by hand, the plate is run through the press, in connexion with the paper, and the latter lifts from the sunken surface of the plate all the ink it has previously received, holding it on the surface of the paper in masses of colour that differ in depth, and consequently in tone, according to the depth of intaglio in different parts of the plate, the result of which is a series of gradations from the pure high light of the clear paper, to the rich, velvety black of a solid body of ink spread over the surface of the paper and not pressed into it. The grain, too, of this plate, instead of being composed of noticeable cross hatchings of lines and dots, is a scarcely discernible "tooth," that is obtained by chemical action on the metal plate before the picture to be etched is transferred thereto. Carbon tissue, being the medium through which the transfer is made, and the finished print very closely resembling in most of its features that beautiful pigment, it is a wonder that the feeling of those interested in seeing justice done to all has not been more forcibly expressed on this subject before.

A name that would answer the purpose, and still be meritorious, is the old title photoglyph, as it applies to all plates which give reproductions from relief surfaces, while photogravure is properly used only in the opposite connexion. Let all, then, who know better be honest enough to call things what they are, and thus do what they can to avoid further complication of the already multitudinous collection of process names in existence both in this country and abroad.

PHOTOGRAPHY APPLIED TO MEDICAL RESEARCH.

[Camera Club Journal.]

In an extremely interesting, instructive, able, and pregnant address lately delivered to the Photographic Society of Great Britain, Professor Meldola touched on the various services rendered by photography to such special sciences as astronomy, spectroscopy, &c., but I was surprised and disappointed that he did not dwell more strongly than he did on the services rendered by our science to medical science. I have little hesitation in saying that the services of photography to medicine have been most important, and I have no hesitation at all in saying that the use of photography is growing in medical schools more than in any other educational and scientific establishments. I believe that before long every medical school, every hospital, will have its installation for photographic work as an essential part of its equipment.

There can be no doubt that the utility of photography in such branches of special work is vast, and, in order to make myself more clear, I propose to divide my subject into two main heads: Macroscopic or Gross Photography and Microscopic or Photomicrographic work.

Under the first head we may notice the reproduction by photography of morbid specimens removed from the living or dead body, but I do not propose to trouble you with objects which are of little interest to many, and positively distasteful to some. I may, however, use two or three slides to illustrate the use of photography in recording the course of disease. Here is a photograph of a case of ordinary "knock-knee" in a boy before operation, and the next slide shows the same leg after operation. They are not even now quite the limbs of an Adonis, but at all events the patient has, after the operation, some mobility and some use in his legs. Here is a slide showing a tongue affected with *epithelioma*, and it is evident that the patient could not have suffered his tongue to be held out in this position long enough for a sketch, however rough, to be made, while this photograph was produced in the twinkling of an eye by means of the flashlight. These three slides were made from negatives taken by Mr. G. L. Cheatle, of King's College, who, a few months ago, had no knowledge of photography. In connexion with flashlight work, I may say that this late development of photography is of the very greatest utility in ward portraiture; by means of flashlight we obtain results with much more certainty and success than we could hope for with ordinary daylight "parlour portraiture."

Now, photography of this kind has its limits and its dangers. It is limited by our limited power of reproducing colour, and where colour is an essential part of diagnosis, for instance, we find ourselves sometimes without a perfect tool if we trust to photography. In skin diseases colour is an important factor in diagnosis, and here we often fail. But I must say that to my knowledge extremely valuable work has been done by photography even of skin diseases. I may mention some work by Dr. Radcliffe Crocker, in London, and particularly I must allude to an *Atlas of Dermatology*, by Professor Piffard, of New York, of which I can only say that it is simply astonishing in its excellence of photographic rendering of skin diseases. And we have also dangers of misrepresentation and misapprehension to guard against, and here is an instance. When Koch's tuberculin was first used in this country I had under observation, personal and photographic, a female with severe *lupus* of the face. I photographed her before the use of tuberculin, and after a very marked improvement had been produced by the tuberculin. In the latter photograph she looks worse than in the first, simply because I under-exposed the negative in the second instance. Where, however, we have to deal with abnormalities of shape, with tumours, with malformations, with dislocations, and the like, we have in photography an invaluable aid to useful, educational, memory-refreshing record.

I now turn to what is more particularly my own province—Photomicrography; and it is not my intention to give you a lecture on histology, nor on any other medical branch of study. I propose simply to show slides which are put forward as illustrating some of the uses to which this branch of photography may be put in medical recording and teaching. And, first, I am aware that many students are kept from taking up this branch of work—so useful and so pleasant—by the idea that very expensive lenses are essential to success. That this is a mistaken notion I shall try to show by this slide of the blowfly's tongue. I did this negative and the slide from it this morning; and the objective with which the negative was produced was taken at random yesterday from a very cheap "student's" microscopic outfit in the shop of Mr. Crouch. I am rather averse to mentioning names in this way, but I see no reason why I should not do so this time. The whole outfit is priced at five or six guineas, so the price of this two-third objective cannot be great; yet, as an expert, I say that the slide now shown would "take a lot of beating" with any glass, however expensive.

The next three slides illustrate the advantage of photography in demonstrating facts which can only be proved by specially fine, or even accidental, preparations. Many sections might have to be cut before we could find ossification of cartilage, mucous glands in the trachea, or taste-buds in the tongue, as they are shown here in Dr. Klein's preparations. The next slide shows some very curious cells in *epithelioma:* I have a collection of thirty or forty such peculiar cells in this disease. The next two are for purposes of comparison between some cells in epithelioma and certain animal organisms found in a disease of the liver to which rabbits are very liable. The question before us now is simply whether by means of photography we can well compare these two objects, and I submit to you that we can.

Some professors, engaged in teaching, have often suggested to me that it would be very useful to show to students the objects on the screen stained as nearly as possible similarly to the objects themselves. By the process of Lumière, of Lyons, published by that firm in France, and in a modified form by myself, I was able to gratify the wishes of my friends the teachers; but you probably will be of my opinion that the results, though they have the desired colour, are not otherwise so good as slides on ordinary gelatine plates. This slide, showing cancer cells invading fat, was actually stained with the ordinary lithium carmine so commonly used in this kind of work. The next slide shows in a very satisfactory way striated or voluntary muscle, and this leads me to point out the frequent necessity of pre-

paring one's own objects when special results are required. Thus the slide of *epididymis*, now shown, could not have been produced from any preparation I have ever seen on the market or ever expect to see. I had to prepare it myself, and the section, if I remember aright, is not more than the 7000th of an inch thick; otherwise I would not have got all the cells round the periphery in focus at once at such a magnification as 650 diameters. This next slide shows part of the same periphery in the *epididymis* of another animal, and here we have the spermatozoa with their heads towards the periphery, and their tails towards the centre, in the orthodox manner. This slide of *ciliated epithelium* I used lately at a public lecture to illustrate one way in which foreign matter is prevented from reaching the lungs. I explained the remarkable action of these lashes; but I did not think it necessary to say that this cell was taken from a frog, not from a man. This flagellum of *bacillus termo* is perhaps the smallest object ever photographed for itself alone. Dr. Dallinger has calculated its thickness as not more than the 200,000th of an inch. This flagellum is extremely difficult to stain, extremely difficult to see even when stained, and consequently not practically available for teaching purposes, unless photographed as here.

This slide shows a device of mine for demonstrating to an audience the *size* of micro-organisms. The cover-glass of the slide is a positive from a negative consisting of ruled squares having each side exactly one-tenth of an inch long. Here, then, in this square on the screen we have seven cocci, separate, not touching each other. The original magnification of the negative was 1000 diameters, consequently you see that in the square, of which each side is the 10,000th of an inch, we can with ease put seven of these cocci. The next slide shows an object very difficult to obtain because of its rarity, and so not usually available for class demonstration, *filaria sanguinis hominis*, lent me by Dr. P. Manson. This animal infests the blood of negroes in certain countries, disappears for twelve hours daily, and causes a very curious and severe disease.

A small glass box containing a layer of gelatineous material compounded so as to form a suitable culture medium for ordinary bacteria, was opened for a definite time on Wandsworth Common. You see here the number of colonies of bacteria which during the given time found their way to the given area of gelatine. In the next slide you see a precisely similar box, containing a precisely similar culture medium, opened for an equal time in Oxford-street. Here we have many more colonies than we had in the Wandsworth slide. This pair of slides represents part of a scientific experiment, and I submit that photography here proved its value as a simple and trustworthy recorder. The slides are from negatives by Mr. E. C. Bousfield. There is sometimes discussion as to the way in which micro-organisms cause disease in the body, whether they act directly by their mere presence, or indirectly by poisons evolved from themselves in the body. Well, here, at all events, in this remarkable preparation of mesentery by Monsieur Pasteur, of Paris, it is evident that the *anthrax* rods are present in the vessels in such numbers that their very presence must constitute disease. These vessels are so completely blocked by the organisms that the whole region must be deprived of blood, and consequently degenerate or gangrenous. And this next slide, a portion of the same preparation more highly magnified, points to another subject much discussed at present—*phagocytosis*. Here are the rods evidently in the blood corpuscles, not over nor below them, but *in* them, for, as you see, both corpuscles and rods are in focus, though the magnification is considerable.

The next three slides are intended by me to act as proofs of a certain theory where other methods of proof had failed. This represents an entire section of skin from a rare skin disease. I found organisms in the sections, always in vessels, never outside of vessels, but attempts at cultivation of the organisms yielded no results. Consequently, it was important to show, if possible, that the organisms occur in the vessels, and not scattered about irregularly, as they might be if they came from the substances used by me in course of preparation. Here is a minute vessel, flask-like in shape; here it is again, more highly magnified, with organisms fairly well shown; this third slide, magnified 1000 diameters, puts an end to doubt, for the bacilli are demonstrated with certainty.

It has by some good authorities been argued that the bacilli of leprosy are not found in ordinary cells of the body, but that they form masses, and exude a "*glia*" strongly resembling a cell. The next three slides show *lepra* bacilli undoubtedly in ordinary cells, for we see distinctly not only the cell walls well defined, but the nuclei; in the second and third slides the nucleus has evidently been split up by the rods. The first preparation, by Dr. G. Thin, is of *pus* from a leprous ulcer; the second and third represent extremely thin sections of leprous tissue, cut by myself, and stained expressly for the demonstration of the relation of rods to cells.

I show, merely as a matter of general interest, two photographs of the bacillus of influenza. The first I photographed more than two years ago for Dr. Klein, who, having confined his experiments to guinea-pigs and mice, failed to complete the chain of evidence required by bacteriologists before they accept an organism as the specific one of a disease. A few weeks ago, Drs. Pfeiffer and Kitisato, of Berlin, using rabbits for their experiments, proved this organism to be the specific cause of influenza. Guinea-pigs and mice are immune from the disease, rabbits are liable to it. The last slide shows the organism nearly pure in the sputa of a patient; the previous one showed a typical cultivation of the bacillus in "broth."

In conclusion, I submit that I have proved the value of photography as a method of demonstration, of research, and of education in medical science. I have before urged here, and I here urge again, those who are practised in photography to give a helping hand to those who are engaged in the science which, of all sciences, is the most beneficial to humanity.

ANDREW PRINGLE.

STEREOSCOPIC PHOTOGRAPHY.

[Bath Photographic Society.]

THE subject which I have been asked to introduce for our consideration to-night, is one so full of interest that I regret it is not in the hands of some one more experienced than myself, having had but two or three years' practice in the art in general, and but a few months in stereoscopic work. Knowing too well the difficulties the secretaries of our societies have to encounter in order to find matter, or, at least, promise to bring it forward at these monthly meetings during the winter, I could not refuse to fill a vacant turn at this meeting. I ask, and I shall deem it a favour therefore, if members will please consider this paper and demonstration as an honest attempt of one of the youngest members of the Society to take part in the work of its meetings.

We frequently have the pleasure of being instructed and interested by lectures and demonstrations by the leaders, who we may regard as the founders of the Society, and, indeed, the subject before us to-night has, I believe, been ably dealt with in years past; still, that is no reason why we, who are now learners, should not submit our work to the criticism of others in order to get our errors corrected. Further, I consider that if this Society is to continue a successful career, as we all hope, much will depend on the share and interest taken by ordinary members in its work.

This, by way of apology, which I trust may prepare you to expect nothing very original in this paper and short demonstration. I shall endeavour to arrange and submit to you particulars of the subject before us which I have gathered from my reading, supplemented, of course, by anything my short experience may enable me to give.

Stereoscopic photography is not a new invention, and I think I may venture to say that in the fourth and fifth decades of this century it was practised more than any other system. I can well remember as far back as the years between 1850 and 1860 that the stereoscope and its paper slides were to be found in almost every country house. But the discovery of the dry-plate process and the rapid introduction of improved portable apparatus doubtless appealed to popular taste, and the fashion for change held the field and the stereoscope was cast aside.

It is notable that, after 1851, stereoscopic work gradually declined until it became almost extinct. As proof of this, if you look into modern works on photography you will find very little, if any, mention of the process. Captain Abney, in his *Instruction in Photography*, published in 1888, devotes one small paragraph to stereoscopic prints, which he says "were at one time greatly the fashion, and regrets their going out, as views never look so realistic as when seen in the stereoscope." In Burton's *Modern Photography*, published in 1890, no allusion whatever is made to the subject, nor do many others of recent date.

Enthusiastic workers who wish to see the process revived have contributed their experiences to the press, and it is to these articles one must go for guidance in use of modern apparatus and dry plates.

There is, without doubt, a great inclination on the part of many good photographers to hark back to this older process, and who will tell you they believe in what Sir David Brewster said forty years ago: "That, although the pictures are small when seen by the unassisted eye, by placing them in an instrument properly constructed they may be made to appear exactly as the original appeared to the photographer when he took the picture." On the Continent, Germany, Sweden, and Norway have regular exhibitions. Some there are, however, who declaim this tendency to go back, and ridicule the stereoscope particularly as giving illusions which are inartistic, &c. Some will say they prefer the whole-plate or larger picture because one can get more on it; but this, of course, is an

error, because given lenses of long and short focus it will be found the angle of the lens which is used to cover the larger plate will include no more than the short focus lens for the smaller plate three and a quarter inches square.

Others deride the stereoscopic picture because, they say, it is necessary to have recourse to a mechanical contrivance in order to see them. This is made the subject of a paper recently read before the Glasgow Photographic Society, a *résumé* of which recently appeared in the JOURNAL. The writer is evidently an old hand, with much artistic experience possibly, and I should be sorry to attempt to contradict what he says, or not to believe there may be something in his contention that the increasing rage for stereoscopic work is but a temporary fashion with photographers, just as tops and marbles are in turn among schoolboys. But, while he deprecates the use of the stereoscope, asserting that a better picture may be seen with one eye, I would venture to remind him that the abused instrument is not absolutely necessary in order to see a picture stereoscopically, and that the power of making two pictures coalesce, provided they are properly taken, may be easily acquired with a little practice. Some people's eyes can acquire this habit quicker than others, but, once acquired and learnt, the power is not easily lost. The writer at Glasgow winds up his paper thus: "As regards the utility of stereoscopic photography, I think that will be confined to instrument-makers and dealers in material." I have in my mind some excellent photographers who will hardly agree with him.

THEORY.

It is impossible, in a short paper of this sort, to enter deeply into the theory of the subject, and it must be sufficient to state briefly the laws which govern it. The word "stereoscopic" is derived from two Greek words—*Stereos*, solid, and *Scopeo*, to view. This effect can only be obtained by binocular vision or by the union of two dissimilar pictures, taken with a camera with two lenses or by a single lens from different angles. The space separating our two eyes, or the two lenses of the camera, form, as it were, the parallactic base of a triangle, and from this base, which varies slightly in width in different persons, being never less than two, or more than three and a quarter inches, the muscular power of the eyes enables them to converge on any object within reasonable distance; the nearer the object, the greater the convergence.

This convergence cannot occur when one eye only is employed, because of the impossibility to form the parallactic angle.

But, as I have already said, this power of convergence becomes less and less strong as it recedes from the base, until objects at a great distance are viewed by parallel vision. This is what gives us the power of estimating distance and of viewing an object solid in the stereoscopic picture—a solidity which sculptors and painters often vainly endeavour to imitate by the chisel or judicious shading with colour. We view our pictures, and look partly round the objects contained in them, especially those in the foreground, with our two eyes, and, as nature has fixed the separation of these optics at a space varying from two and a half to three inches from centre to centre, it follows that our pictures must not be more than this width in order to obtain correct stereoscopic effect.

CAMERAS.

With regard to cameras, we may consider that any camera is capable of taking stereoscopic negatives, although preference is now given to a binocular, *i.e.*, to one having two lenses, and taking both pictures simultaneously.

Larger cameras are now generally preferred. Any size will do, provided it has two lenses in an adaptable front and a septum inside. A square-bellows camera, fitted thus, size 8 × 5, is the one most in use, the advantage being that you get your subject larger, and in cutting out the picture for your slide, you are able to take or leave any particular part of it. How this is easily done I shall be able to explain when we come to the cutting and mounting of prints. For a long time, in the earlier days of photography, a single-lens camera was mostly used for this work, and in some cases the plan is still the best, and many subjects require the base of the parallactic angle to be so great as to render the employment of a single-lens camera absolutely necessary. For example, if we are going to take a view at a distance from the seashore, where objects at that distance could produce no effect of solidity when viewed with both eyes from the point of sight, everything would look flat, and in one continuous line; but, by taking a photograph of the coast at one point, and then sailing along for a mile or so in the contrary direction, and exposing the other part of the plate, we should increase the parallactic angle, and the subject would be depicted in relief, and the effect of solidity produced in the result pictures when combined in the stereoscope.

It is of the greatest importance, when two lenses are used, that both should be exposed simultaneously, hence this bar on the caps, both of which would be better replaced by a shutter, which I intend to have made. And, when a single lens is employed, the exposure must be made under exactly similar conditions. There should not be the least movement of the object between the exposures, and consequently the single-lens camera is not so applicable for photographs of anything likely to move out of doors. Movement of the subject in a stereograph is represented by an unsightly blur, which effectually spoils the picture.

A word with regard to lenses. It is pretty generally admitted, I find, that the single achromatic lens is best suited for stereoscopic work, especially for landscape, seascape, and ruins. The only objection is that, when photographing an architectural subject very close, the uprights are rather distorted, especially if you have no swing back, as in this case; but, unless this distortion is very excessive, it does not matter, as the stereoscope will rectify it, while, on the other hand, if a picture be taken with a doublet, and is perfectly rectangular, the stereoscope may upset it to a disagreeable degree.

Care must be taken to see that both lenses are well screwed down in their flanges; also that the camera is level. Here you will see I have taken precautions.

The exposure of the plate should be ample, and subsequent development not carried too far, or the result may be a hard negative, which is a constant cause of snowiness in the prints or transparencies, especially when green leaves of trees, shining roofs of houses, or white roads have reflected a lot of light into the camera. Among the prints on the table you will find some I have purposely included to show how seriously I have erred in this respect; and, although they may look fair prints to the eye, if you put them into the stereoscope, you will soon discover the faults to which I allude. Brilliant negatives, such as we aim to get with a single lens to make pictures for the album, seldom make nice pictures for the stereoscope, while a flat, miserable-looking print is greatly improved, and gives best stereoscopic effect. You will observe some of the American prints are decidedly flat in appearance.

A very good plan, with a print from a dense or brilliant negative, is to expose it to a good light without the negative before toning, and thus, by degrading the high lights, the picture will appear softer in the stereoscope.

It will be understood that, in order to obtain prints which will give correct stereoscopic effect, it will be necessary to transpose the parts of the negative, that the right lens picture may be presented to the right eye, and left to left.

Here we call for both skill and patience, which can only be obtained by much practice. To the want of care in cutting and mounting prints is due much of the depreciation of stereoscopic work. Even now, among those who wish to revive it, I learn there is a great amount of carelessness, if not ignorance, displayed in this important part of the process. A celebrated photographer, who a short time ago was asked to judge the slides sent in for a stereoscopic competition, criticises the work of the competitors rather severely. He says, "Some of the prints were simply comic; as if the authors belonged to some select society, whose motto was, 'How not to do it;' and, if so, they had succeeded, and might triumphantly cry 'Excelsior!'" A great many of the prints had not been transposed in mounting, giving, therefore, a pseudo-scopic effect, so that distance became foreground, and latter, distance. Others were unevenly mounted from the base, and required one eye to be higher in the head than the other, in order to see the picture.

One cannot impress too much upon those who would revive this beautiful art science, that it is not only insufficient to properly transpose the two pictures, but that they must be mounted on the same plane, and the slightest error there is in this direction the greater will be the difficulty in making the pictures combine in the stereoscope. The rule is, having settled the width of the two pictures, to select something in the foreground—a bit of round stone, or a fault in the ground, and to cut the base line through the two pictures at this line—the height may be left to take care of itself—and may often extend to four inches without inconvenience.

Beautiful as these paper slides are, especially when printed on good matt surface paper, there is nothing so good as a stereoscopic transparency. There is a selection on the table, and a few also of my own make, by a process which I hope to demonstrate successfully.

It is generally admitted, except by very prejudiced people, that a more perfect transcript of nature cannot be produced than by a well-printed stereoscopic transparency. But the care, precision, and practice which I mentioned as being so necessary in cutting and mounting prints applies even more to the making of these transparencies. A little error in the paper print may be set right, or eliminated entirely, by the help of the knife, but not so easily when one comes to transpose and print from glass to glass. Some photographers will cut the negative, and, having transposed the parts, print from it direct, as for lantern transparencies. This

plan, perhaps, is the best in the hands of an expert in the use of the diamond.

THE STEREOSCOPE.

Here we have an instrument known, I believe, as Holmes' Stereoscope, and which has been in use in America during the last twenty years, and is now finding a ready sale in England. There is no doubt, if this instrument had been introduced into England thirty years ago, stereoscopic photography would not have lost its popularity with the public. It certainly was the cause of raising my enthusiasm, and, having acquired an instrument and some pictures, I began to look about for a good camera to do some of the work myself.

Bad instruments, as well as bad prints, had much to do with the decline of public taste in regard to the stereoscope; but now, with the advance of the art of photography, dry plates of any speed, and improved apparatus for taking as well as viewing the pictures, I hope there is a good future in prospect for the stereoscope, and that many here, as elsewhere, may derive as much pleasure from it as I have done.

E. J. APPLEBY.

PHOTOGRAPHY AND PHOTO-MECHANICAL PRINTING.*

THE preparation of collotype plates is not difficult. The first thing necessary is a suitable oven, in which to dry the film of sensitised gelatine, for with this process rapid drying at a considerable heat is necessary. A large box with a sheet-iron bottom, which can be heated with Bunsen burners, answers very well, though hot-water pipes are preferable. This drying box should have a lid covered with canvas, to permit quick evaporation, and the interior must be fitted with adjustable points, on which the plates can be accurately levelled. There should also be a thermometer fixed with the bulb inside the box, so that the amount of heat can be readily adjusted. The chemical composition of the films is the same as that employed in photo-lithography, with the difference that the gelatine should be hard and very pure. The inking and printing of collotype plates is necessarily an operation which places a great strain on the holding power of a film of wet gelatine to its glass support, a pressure of several tons being sometimes required to obtain the impression on paper, and a powerful substratum is used to cement the printing surface to its glass support. The following is approximately the formula for the substratum :—

Albumen	10 ounces.
Water glass	4 ,,
Water	10 ,,

This solution is filtered and flowed over the surface of the ground glass, which is then dried after a slight washing. The plate is then ready for the sensitising solution, which is composed of—

Hard gelatine	3 ounces.
Water	1 quart.
Bichromate potash	½ ounce.

The glass plate is warmed, and the sensitising solution also warmed, and, after carefully filtering through flannel, is poured over the surface of substratum, and the plate is immediately placed on the levelling screws in the drying oven, and heat is applied. The drying ought to occupy about half an hour. When the plate is dry, it is ready for exposure under a negative. Here is a plate ready for exposure. We ought to mention, the negative must be reversed, that is, if what is called a right-hand picture is desired. There are several ways of reversing negatives; direct in the camera, by means of a reversing mirror, or even by placing the plate in the dark slide wrong way about, first carefully cleaning the glass side of the plate, and allowing for the thickness of the glass in focussing; but the most generally adopted methods are, first, by stripping the films from their original glass, and turning them over on to another one; and, secondly, by making a transparency and copying it in the camera through the glass.

Having obtained a reversed negative, the margins should be masked to the size of the required print with thin black paper or tinfoil, and placed, with the sensitive collotype plate, in a printing frame for exposure. The time required for exposure will, of course, vary according to the density of the negative and to the quality of the light; and, as the plate cannot be examined during exposure, an actinometer is used to measure the amount of light falling on the plate. Experience is really the only guide as to correct exposure, but the average time in a moderate light may be taken as half an hour. After exposure, the plate is removed to the dark room, and is placed in running water for about half an hour to wash out the unacted-upon bichromate, after which the plate is allowed to dry spontaneously, and it is then ready for printing. (Here are exposed plates, one plain and one inked.)

The printing may be performed in an ordinary printing press, with a sheet of indiarubber over the tympan, or, as is most in vogue, in a lithographic press. The plate is first damped with a sponge and water, as Mr. Geddes is now doing, and, after wiping the surface dry, ink is applied, first with a leather roller for the purpose of inking up the shadows and stronger parts of the picture, and then, with a gelatine roller, to give ink to the half-tones. A piece of ordinary paper is now placed over the inked image and pressure is applied, the result being, if all goes well, a permanent photograph in printing ink from the negative used. If ink of a photographic or silver print colour is used, and the paper is afterwards enamelled, the results are to all intents and purposes a photograph.

Before we conclude, we must just mention one of the most interesting and fascinating phases of collotype printing, and one which is as yet only in its infancy. We refer to chromo-collotype, and will venture to say it is the nearest approach to the much-sought-for process of photography in natural colour. In this process use is made of the fact that all colours emanate or are produced from the three primaries, namely, red, blue, and yellow, and, by the aid of specially sensitised colour plates and our knowledge of orthochromatic photography, we are enabled to analyse the colours of a picture, and produce three plates which have the property of photographing the particular primary colours for which each one is sensitised; then, by printing these three negatives in their separate colours, one over the other, by collotype, using a transparent ink, we obtain very approximately the actual colours of the original picture or landscape. We cannot go into this matter further now, as the time at our disposal is short, and the entire process is too complex. We have here some examples of this work, upon which we have recently been making a series of experiments, and there are specimens printed from the negatives of each colour as well as complete proof printed in the three colours and registered one over the other, viz., red, blue, and yellow.

PAUL L. WATERLOW.
J. D. GEDDES.

* Concluded from page 249.

A PHOTOGRAPHERS' HALF-HOLIDAY.

IT will be remembered that a few weeks ago we mentioned that several of the Greenock photographers had resolved to close their establishments for one afternoon per week, in order to give their assistants a holiday. A similar movement has recently been started in Glasgow, where, we are glad to find, it has met with great favour among the photographers, the under-mentioned houses agreeing to close their places of business during one afternoon of each week :—

Friday, three p.m.: A. Macnab, Brinkley & Stevenson, Turnbull & Sons, G. Bell, Crawford Hamilton, James Philson, Watson & Wilson, Robert T. Dodd, James Whyte, Glasgow Photographic Company, Robert Ness, Forbes & Co., William Gemmell, William Hall, William Hicks, Ovinius Davis, A. & G. Taylor, W. Hampton, M. Pearlman, T. W. Stevens, A. Finlayson, Stevenson & Co., Patterson & Co., W. Warneuke. Saturday, three p.m. : John Stuart, Limited, T. & R. Annan & Sons, William Ralston, Alexander Brothers, Mons. Lafayette. Two p.m. : Adamson Brothers. Wednesday, three p.m.: Ralston & Sons, — Mitchell.

According to the terms of the agreement the movement comes into operation in the first week of May. We congratulate our Glasgow friends on their just and considerate action, and, in the interests of photographic assistants generally, we trust that it will receive a large degree of imitation in other parts of the country. Mr. J. J. Moran (of Messrs. Turnbull & Sons, Glasgow) has taken an active part in the movement, the success of which must be very gratifying to him.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 6443.—"Improvement in Photographic Cameras." J. H. PENNY.—*Dated April 4*, 1892.

No. 6527.—"An Improvement relating to Oxy-hydrogen Limelight Lanterns." H. J. HUSBANDS, J. W. HUSBANDS, and A. W. HUSBANDS.—*Dated April 5*, 1892.

No. 6543.—"Improvements in the Manufacture of Pyroxyline Solutions and Compounds for Photographic or other Films or Coatings, and for Solid or Massive Articles." Communicated by F. Crane. J. S. FAIRFAX.—*Dated April 5*, 1892.

No. 6631.—"Improved Portable Photographing Apparatus." J. CARPENTIER.—*Dated April 6*, 1892.

SPECIFICATION PUBLISHED.

1891.

No. 9598.—"Gauges for Centering Lenses, &c." Communicated by Smith, WISE.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
April 25	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 25	Gloucestershire (Annual)	
,, 25	Lantern Society	20, Hanover-square.
,, 25	North Middlesex	Jubilee Hall, Hornsey-road.
,, 25	Rossendale	Townsend-chambers, Rawtenstall.
,, 26	Great Britain (Technical)	50, Great Russell-st., Bloomsbury.
,, 26	Lancaster	Storey Institute, Lancaster.
,, 26	Leith Amateur	
,, 26	Warrington	Museum, Bold-street, Warrington.
,, 27	Bath	Roy. Lit. & Sc. Inst., Terrace-walks.
,, 27	Burnley	Bank Chambers, Hargreaves-street.
,, 27	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 28	Birmingham	Lecture Room, Midland Institute.
,, 28	Camera Club	Charing-cross-road, W.C.
,, 28	Hackney	Morley Hall, Triangle, Hackney.
,, 28	Halifax Photo. Club	Mechanics' Hall, Halifax.
,, 28	Hull	Royal Institution, Hull.
,, 28	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 28	Liverpool Amateur	Crescent Chambers, 3, Lord-street.
,, 28	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 28	Oldham	The Lyceum, Union-street, Oldham.
,, 29	Cardiff	
,, 29	Holborn	
,, 29	Maidstone	"The Palace," Maidstone.
,, 29	Richmond	Greyhound Hotel, Richmond.
,, 29	Swansea	Temby Hotel, Swansea.
,, 30	Putney	High-street, Putney.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 14,—Mr. A. Cowan in the chair.

Messrs. A. Dawson and H. W. Bennett were elected members of the Association.

The following questions from the box were read:—"What is the best way to correct the acidity of a glue mountant to ensure its keeping?" To this no definite answer was forthcoming; but in reply to the following, "With which developer can the harder negative be produced, pyro-potash or pyro-ammonia?" Mr. F. P. CEMBRANO said, if anything, with pyro-potash.

The evening was chiefly devoted to the exhibition of a large number of lantern slides, illustrative of some of the places visited during the Convention weeks at Derby, Birmingham, Chester, and Bath. The slides were the work of Messrs. F. P. Cembrano, jun. (the Honorary Secretary of the Convention), and Mr. H. M. Hastings, by whom they were shown in the lantern, the former gentleman, prior to the exhibition, expressing the hope that the beauty of the places visited would induce larger attendances at future Conventions.

At the conclusion of the display (which included a few slides of the recent University boat-race by Mr. H. M. Hastings) the thanks of the meeting were tendered to both gentlemen, and the proceedings terminated.

The Lantern Society.—April 11, Mr. E. M. Nelson in the chair.—A lecture was delivered by Mr. E. W. MAUNDER, F.R.A.S., on *The Work of the Spectroscope as applied to Astronomy*. In commencing his address, Mr. Maunder remarked that the title which had been announced for his lecture was of somewhat too broad a character, and that, inasmuch as it would be impossible, within the time at his disposal, to even touch upon the numerous branches of spectroscopic work connected with astronomy, he proposed to confine himself chiefly to the application of the spectroscope to solar researches, adding some remarks on stellar spectroscopy. Commencing with Newton's researches on the composition of light, and the subsequent experiments of Wollaston and Fraunhofer, Mr Maunder went on to explain the principles on which a spectroscope was constructed, and to describe some of the chief varieties of the instrument now in use. The discovery of the Fraunhofer lines, and the experiments of Kirchoff, proving that these dark lines were due to the absorption of certain rays by incandescent gases, the mapping of these lines by Angström in the solar spectrum, and their identification with lines due to the presence of certain terrestial elements in the solar atmosphere, were next dealt with, Angström's chart of the normal solar spectrum being thrown upon the screen. As showing the great advance which has of late years been made in the study of the solar spectrum, Mr. Maunder also showed on the screen portions of the magnificently defined spectra recorded photographically by Mr. George Higgs, of Liverpool, whose arrangement of spectroscope, devised (with the exception of the diffraction grating) wholly constructed by himself, was also illustrated by a lantern slide. Dealing next with solar physics, Mr. Maunder described the structural features of the sun so far as they are at present understood, touching on sun-spot periods, the peculiarities of sun-spots during the periods of maxima and minima as revealed by the spectroscope, the constitution of the chromosphere, and the application of the spectroscope to the observation of prominences, which, prior to such application, had only been observable on the occasion of total solar eclipses, when the sun's disc was obscured by the dark body of the moon. The latest development in this particular branch of research—namely, the photographing of the solar prominences by Professor George Hale at Chicago—was also described and illustrated. After speaking briefly of the spectra yielded by the planets, Mr. Maunder next dealt with cometary spectra, pointing out the resemblance of what may be called the normal spectrum of a comet to that of carbon in olefiant gas, and showing how, as some comets had passed very close to the sun, their spectra had shown indications of the presence, first, of sodium, and (when still closer to the sun) of iron in a gaseous state. Next Mr. Maunder dealt briefly with the chief features of stellar spectroscopy, describing the mode of observing and photographing stellar spectra adopted at Harvard College Observatory, and explaining the principles on which the velocity of stars in the line of sight is measured. In connexion with this department of the subject, the discovery of the duplicity of β Aurigæ by Professor Pickering, solely by the variations in its spectrum, was described, while, finally, some interesting notes were given on the recent new temporary star in Auriga, the spectrum of this star being thrown on the screen, and its special features explained in detail. The lecture was illustrated by a large number of lantern slides, and was throughout a most interesting one. The next meeting of the Lantern Society will be held on Monday, the 25th inst.

Dundee and East of Scotland Photographic Association.—April 7, Mr. J. D. Cox (President) in the chair.—A demonstration was given of the stripping and enlarging powers of "Cresco Fylma." A quarter-plate transparency was successfully stripped and enlarged to fully 5×4. The process had been found useful in the hands of the demonstrator for saving cracked negatives. Mr. D. Ireland exhibited 140 slides, being part of his Norwegian work last year. Mr. Feathers exhibited the Ideal and Shuttle hand cameras. Prizes were awarded in the under-noted competitions as follows:—Junior Lantern-slide Competition: 1st, J. S. Lawson; 2nd, J. M. Wilson; 3rd, Dr. McGillwray. Bromide Print Competition: 1st, J. McInroy; 2nd, D. Ireland; 3rd, Dr. McGillwray.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

PHOTOGRAPHY AND THE DETECTION OF CRIME.

To the EDITOR.

SIR,—The interesting collection of photographs, and the paper accompanying them, now being circulated amongst the photographic societies under the affiliation scheme, seem to be much appreciated wherever they are exhibited. But I think the paper, interesting as it is, would have been still more so to the majority of those before whom they are exhibited had the methods employed to obtain the striking effects—striking as compared with other photographs taken under normal conditions—been explained. The Doctor, in his paper, several times refers to "my method," but does not describe what that method is, and wherein it differs from those usually adopted. I presume, therefore, as he makes a specialty of this class of work, he prefers, as a matter of business, to keep the details of his method, or modes of procedure, to himself. Be that as it may, the photographs by themselves are none the less interesting or valuable, as showing what may be accomplished in the application of photography in the detection of crime.

Of course, what Dr. Jeserich has achieved others may accomplish if they gave sufficient time and attention to the subject. I should not be surprised if the prominence now being given to the topic, by the exhibition of the slides, acts as an incentive to others to go into the subject as a matter of business in this country. Clever experts in such matters as those Dr. Jeserich has taken in hand might find the business highly remunerative, particularly after they, like the gentleman named, have gained some notoriety. For example, in questions of forgery or the falsification of documents, like some of the examples in the collection, large sums would frequently be paid for incontestable proof of the falsity or the genuineness of the writings. At present the chief evidence relied upon here in such cases is that of experts in handwriting and that is often received—and not without reason—with a considerable amount of hesitation, especially when experts are engaged by each of the contesting parties.

This brings me to the question. Supposing several photographers made a specialty of this particular class of work, as Dr. Jeserich has done, and some were engaged by one side in a suit to prove that, say, a deed had been tampered with, and others were employed by the opposite side to show that it had not. The latter, by taking the negatives under ordinary conditions, might show that a pure photograph exhibited no falsification whatever, as in the case of the Doctor's comparative plates. The former, working under modified conditions, might in their photographs show that a fraud had been committed. Here would, of course, be a direct conflict of evidence, quite as great as that frequently given by experts in the case of handwritings. The one would be quite justified in asserting that his was a pure, unsophisticated photograph, and it, like the original before the Court, exhibited no trace of alteration. The other, under cross-examination by a shrewd counsel, would be compelled to admit that in order to obtain his results the photograph, which differed from what could be detected by the eye, had been taken under modified conditions and by a special treatment or method of working. This might be construed by a non-technical jury, influenced by the arguments of a clever counsel, into a sophistication of the photograph.

It is unfortunate for the credit of the art that photographs are now looked upon with a certain degree of doubt in British Courts of Law, and rightly too in many instances. Here is a case in point. I was recently shown a photograph taken to prove damage in a case of "ancient lights." It certainly fulfilled its object, for it showed a strong cast shadow of the new erection right across the windows claimed as the ancient lights. But it was, nevertheless, a very misleading picture, inasmuch as it was taken under exceptional conditions, that is, very late in the evening, when the sun was setting, consequently it produced very long shadows. Had it, or another picture, been taken earlier in the day, no such obstruction would have been shown. However, the picture was accepted as a proof that injury was sustained, and a good sum was paid as compensation in order to avoid further costly litigation.

On one or two former occasions you have suggested that the police authorities do not, officially, make so great a use of photography as they might do in the detection of crime. It is true that all convicted criminals are photographed, and the portraits systematically arranged and preserved. But a much more extended use might be made of it in furthering the ends of justice. Often, when, say, a murder or other outrage has been discovered, if a photograph, or a series of photographs, were taken of the immediate surroundings at once, before anything was disturbed, it would frequently aid in settling matters sometimes left in doubt. Frequently it happens that the evidence adduced as to the precise condition or position of certain things at the time of the discovery are very conflicting, a thing not to be wondered at considering the excitement general at the moment. Notably was this the case in connexion with one of the East-end tragedies, and also in others. But a photograph, if forthcoming, would put matters beyond all question.

There is no place where, or rarely, conditions under which a photograph good enough for all purposes cannot be taken, even if not reached by daylight, thanks to gelatine plates and magnesium. The time, I hope, is not far distant when an official photographer will be attached to every police division under conditions similar to those under which surgeons and others are now appointed.—I am, yours, &c., LEX.

April 16, 1892.

RATIO OF GRADATION.

To the EDITOR.

SIR,—In your last issue "Free Lance" seeks to throw on to me the onus of treating this matter as a burlesque. In a former letter I showed that the recent utterances of Messrs. Hurter & Driffield are at one with their original paper, and consequently that there was no ground for charging them with "ignorance of their own work such a short time after its publication." I called attention to "Free Lance's" opinion anent "the universal practice of photographers to alter the ratios by modifications or changes of development," that the ratios "can be changed at will." I inquired how he could change them, and in reply I have nothing but a vague reference to a trivial variation noted by Messrs. Hurter & Driffield, which "Free Lance" has evidently not forgotten.

In order to meet the obvious reply that the ratios remain practically unaltered by the variation in question, he states that the words "almost identically the same" are without meaning in a scientific question!

I must, for the present, conclude that "Free Lance's" knowledge of altering the ratio of gradation is derived from Messrs. Hurter & Driffield's observations; and that, did he know more of their writings, he would know more of this subject. It would also appear that he has been having a quiet joke with the readers of the JOURNAL, as one who should say, "I think I can find you bread to eat," and offer a crumb from the last loaf. Of course, a joke is a joke, though it may be a bad one.

May I take this opportunity of replying to a question that has been put, more than once, by the Editor to correspondents, as to the possibility of a latent image "setting off" on to an unexposed plate? I exposed a piece of bromide paper behind a negative to sufficient light to produce a vigorous image. I then moistened the paper, and squeegeed it face to face with an unexposed piece of similar paper. I developed the compound for upwards of an hour, until the image was well visible when held up to the light. The papers were then pulled apart, and the image was found to be entirely on the exposed paper. I think this should allay all fears of the setting off of the image from plate to plate; but how is it to be reconciled with Captain Abney's experiment of coating a gelatine plate with collodion emulsion, and developing the two in contact? Will some one who has a bottle of collodion emulsion repeat this experiment? It may be that some plates are phosphorescent, and others not; it is, however, of importance to set the matter at rest. The general conclusion is that a particle of developed silver compound reduces contiguous particles unaffected by light. The equation of Messrs. Hurter & Driffield does not assume this, but is grounded on the supposition that only particles altered by light are developable. This is apart from general fog, caused by the action of the developer on silver unchanged by light, and irrespective of its contiguity to changed particles.

My thanks are due to Mr. Channon for his reference to Captain Abney's original paper. His reproduction of Captain Abney's figures interests me exceedingly, and I should like to suggest a possible explanation of the difference found from the law of Hurter & Driffield. These state that the law holds only for some substances, not for all; and they especially mention silver reduced in a film as long *as it does not assume a metallic lustre, nor reflect much light*. But if Captain Abney first threw down the silver, and then incorporated it with gelatine, the particles would probably have great lustre, and by reflections and re-reflections appear much more transparent than would dull granules. The subject is full of interest, and I shall be glad to hear anything which may assist in its elucidation.—I am, yours, &c., R. C. PHILLIPS.

Arts Club, Manchester, April 18, 1892.

To the EDITOR.

SIR,—We received a private communication from Mr. Channon, asking us to take no notice of his letter in your issue of the 1st April, as he had very considerably altered his opinions, and as he intended to send another communication to the JOURNAL. We have waited for the appearance of his third letter; but, as it has not come forward, we feel it necessary to briefly reply to the second.

Mr. Channon, like others of our critics, shifts his ground. In his first letter he opposed Plener's formula to our own as superior for mathematical reasons. Finding, however, that Plener's formula could not be supported by clear reasoning, involving a consistent definition of the symbols used, he abandons this formula in his second letter, and opposes us with Captain Abney's *Law of Error*. This *Law of Error* we have criticised elsewhere, and we are reluctant to add anything to that criticism at present, though there is much yet to be said about it. From Mr. Channon's letter to ourselves we gather that he has now abandoned the *Law of Error*, and we are at present waiting to learn what he has to put in its place.

To our request for a sample of plates differing in behaviour from those we have investigated, and to which the formulæ we published do not even apply approximately, Mr. Channon has not acceded, nor has he again mentioned the subject. It is fair to conclude that he is still in search of such plates. When he has found them, we shall be glad to investigate and report upon them.

May we remind Mr. Channon that formulæ, to be satisfactory, must account at least for the phenomena of under-exposure, over-exposure, and correct exposure; and that neither Plener's nor Captain Abney's formulæ will do this; that these formulæ must be simple, if they are to admit of practical applications; and that they must also account for certain peculiar relations which exist between negatives and their positives.—We are, yours, &c., F. HURTER & V. C. DRIFFIELD.

Appleton, Widnes, April 16, 1892.

[In justice to Mr. Channon we should state that his interesting communication, which appears elsewhere, was unavoidably held over from our last issue.—ED.]

BACKGROUNDS.

To the EDITOR.

SIR,—In reply to your request for information for "McDawber," Messrs. J. Williams & Co., Langley Mills, Manchester, manufacture a strong sheeting suitable for backgrounds, all widths up to nine feet. I have an eighteen feet screen made by them with only one joint, and, speaking from memory, I think the price was 3*s*. per linear yard.—I am, yours, &c., EDWARD J. SMITH.

Park Royd, Halifax, April 18, 1892.

To the EDITOR.

SIR,—In reply to "McDawber," any large drapery establishment doing a family trade will be able to supply *good* white sheeting, also linen, which would be preferable. People who buy the unbleached seldom have beds that require sheets more than two yards wide.

In making application for prices and patterns, he should ask for eleven or twelve-quarter (the former would be about eight feet wide), requesting that it *be not less* than the exact width wanted; a few inches over would not matter.

Personally, I have seen it at Swan & Edgar's, Piccadilly-circus, W., and other large West-end draperies.—I am, yours, &c.,

Stradbroke, Suffolk, April 16, 1892. WM. GIRLING.

MODIFYING LENSES.

To the EDITOR.

SIR,—The formula for calculating the focus of combined lenses given in my paper (THE BRITISH JOURNAL OF PHOTOGRAPHY, March 18) should have been $\frac{A \times B}{A+B-C}$ as stated by Mr. George C. Pile. It was written so in my manuscript, and the error, as printed, is so striking that it can only be due to the printer.—I am, yours, &c., HENRY W. BENNETT.

April 20, 1892.

PHOTOGRAPHY AT BIARRITZ.

To the EDITOR.

SIR,—As most of my photographic friends are not aware of my present abode, I write a line to say I am here with my camera and lantern. I have registered a vow not to bring again the latter abroad, as the difficulty of getting a supply of oxygen is considerable and the price excessive.

Biarritz during the winter and spring months is taken complete possession of by the English. As you walk through the streets, on the Grande Place, or sit on the rocks, the sound of the well-known tongue falls on your ears, for our language now is the most universal; and whether, when it covers this world, as, if it increases in the same degree, it gives rise to any Babel confusion, is a matter on which some may speculate.

The hotel-keepers, proprietors of villas, and shop folk are well favoured here, as there are only six weeks in the year when Biarritz is without a season. The English season commences in November, and lasts until May; then comes the interval until the 15th of July, when the place is empty. The Spanish season is then on, it being the great event of the

year. During this time prices become nearly double, and the Spaniards bleed freely, preferring English artists to all others. After the Spanish season comes the Russian—October to a part of November.

But, although the summer is the bathing season, bathing is going on now, and ladies were seen swimming in the Port Vieux on the 17th March. On the 5th of April I saw a party, of six ladies and four gentlemen bathing in the same place, and I took a photograph when one of the former was taking a header off a rock. It is well to mention that the temperature was at the time 78° in the shade. As regards temperature, Biarritz holds a good standing. I have kept a rough mem. for the last fifty days, and I find that at nine a.m. the average temperature was, in the shade, 62°. On a few days, when, even in Italy, snow lay on the ground—March 4 to 7—the thermometer at nine a.m. varied from 35° to 37°, but no snow; of course, during the advance of the day the temperature increased, and I noted one day, at 3.30, the temperature rose to 79°. Then, as regards sunshine, out of fifty days there were forty bright, sunny, dry days, ten being rainy, without sun.

Biarritz does not afford many subjects for photography beyond sea and rocks—the latter are not particularly striking. I expected great things from the Bay of Biscay, but found it, on most days, very tranquil. I was informed I would see waves slowly advancing like a great wall of twenty feet, then suddenly falling on the shore. These I did not see, although I daily looked for them. A friend of mine, who has resided here for four years, has not seen such. His remark to me on the subject was, "These are to be talked about, but not seen."

As regards my lantern. After much trouble in the pursuit of oxygen gas, I discovered that some was kept in Bayonne for medical purposes. It was sold in large cylinders, holding 200 litres, at a pressure of eight atmospheres, which, I was informed, was equal to fifty-five English gallons, or to about forty-six English feet at 120 atmospheres; but it only lasted, when burnt in the lantern, for two and a half hours. I find, when using my twelve-feet cylinder of 120 atmospheres, I can get nearly four hours out of it, costing 3s., while the Bayonne gas cost me 14f. (11s. 1d.) for two and a half hours, or about 1l. for what in England costs 3s. The quality of the gas was excellent, and I do not think I ever had such a brilliantly lit screen. My spectators were much pleased; it was the first time the limelight was ever seen in Biarritz, so that I have made a decided score in this instance. I leave to-morrow for the Pyrenees.—I am, yours, &c.,

T. M. Brownrigg.

The British Club, Avenue du Palais, Biarritz, April 12, 1892.

ATMOSPHERIC PERSPECTIVE.

To the Editor.

Sir,—Allow me to supplement your reply to F. Baxter (issue of 15th) by pointing out that the over-exposure of No. 2 plate was probably due to the fact that, owing to the greater distance at which second view was taken, the light from a much greater area was focussed on to the same-sized plate. I was some time in tracing this source of error, and was led to it by noticing that my over-exposures were principally on plates which embraced an extensive view. I should expect the atmosphere amongst the Welsh hills to be pretty clear, and have myself successfully photographed and got clear negatives of objects at a distance of a quarter of a quarter of a mile, and have seen many bright photographs of Swiss and other scenes which must have been taken at a greater distance than that.

In taking negatives which embrace an extensive view, I now either shorten the exposure or stop down the lens.—I am, yours, &c.,

April 18, 1892. Clare.

"PHOTOGRAPHIC PORTRAITS."

To the Editor.

Sir,—The intentions of your correspondent Mr. Cimabue Brown, jun., in seeking to find some excuse for vulgarity are no doubt creditable to his kindness of disposition, but, at the same time, based, I think, on a misconception of the case. It is, of course, impossible to prevent foolish and vulgar people from writing foolishly and in bad taste under the cover of anonymity. My object was, however, to call attention to the responsibility of the Editor of the journal in question, and to suggest that he could not have been aware of the nature of the communication.

I can hardly imagine that opticians as a body, or rather, perhaps, I should say makers of optical instruments, can, as your correspondent suggests, be in sympathy, under whatever provocation, of such methods as their trade organ (as Mr. Brown calls the journal in question) has used. It would be a libel upon them to suppose it. And, again, what has been the provocation? I admit, for myself, that I have written elsewhere that "a first-class lens has no more artistic value than has (in literature) a first-class pen." But, Sir, the opposition amongst photographers, if I may be allowed to call it so, is never tired of asserting that no art is possible in photography. They hail with evident delight and glee opinions such as those expressed by Mr. Joseph Pennell at meetings when the subject is discussed. If that, then, is their view of the matter, if no art is possible, why find fault if we assert that the most perfect of optical appliances cannot import art into it? Again, supposing that for half a century or more numbers of misguided people had been in the habit of using double convex lenses of the highest quality, free from astigmatism and all the rest of it, say, as soup-plates, and that the doctrine were suddenly preached and disseminated that common delf, of a concave pattern, would be more useful; or, with greater hardihood, if it were asserted that the total suppression of such optical instruments, and a return to the purer and more primitive method of forming a bowl in the hollow of the hand would be productive of better results, would the opticians be justified in exclaiming, "It is true people are foolish; but, at at the same time, we are enabled to sell them large quantities of our goods, with which they fruitlessly endeavour to attain the unattainable; if you promulgate your doctrines, they will come to their senses, and our trade will be ruined?" I think not.

Mr. Cimabue Brown, jun., holds that what he calls the new school may be distinguished in future by the mark, "No lens, no brains." Now, Sir, this is, of course, only an assertion, which, on high authority, would no doubt demand grave and earnest consideration. But, if Mr. Cimabue Brown, jun., is a great and weighty authority, to my shame I must confess that I never heard of him before. I am inclined to surmise, however, that the name is but a pseudonym, veiling, perhaps, the most distinguished identity; but, until we know this, subject to the inevitable depreciation of value which, as a general rule, attends the outpourings of anonymous contributors. But, supposing the epithet to be, in this instance, well applied, it will be remembered that I challenged our opponents to name half a dozen expounders of the new system, a challenge which has not yet been taken up. Is it reasonable, then, to expect that we should find a large volume of brains amongst so few? Oh, pray do not let it be imagined for a moment that I accuse Mr. Cimabue Brown, jun., of inferring that the quality of the brains has anything to do with the matter! We know, of course, that more brains must be found amongst the multitude than can be possessed by a lesser number. By the way, though, Mr. Cimabue Brown, jun., refuses to concede, by his formula, any brains at all—"No lens, no brains."

Seriously, Sir, I cannot imagine that opticians are at all alarmed by the idea that the exhortations of the poor little band of brainless ones is likely to deprive the optical trade of their usefulness and means of livelihood. King Sol himself might as reasonably get red in the face with indignation at the advent of Mr. Humphrey's oxy-magnesium lamp.

Mr. Cimabue Brown, jun., must, I think, find some other grounds of excuse.—I am, yours, &c.,

Alfred Maskell.

London, April 17, 1892.

THE CHICAGO EXHIBITION.

To the Editor.

Sir,—May I ask you to give publicity to the fact that, Her Majesty's Government having increased to 60,000*l.* the grant of 25,000*l.* originally made for the purposes of the British Section at the Chicago Exhibition, the Royal Commission for that Exhibition are enabled to dispense with the revenue it was proposed to raise by charging the exhibitors in proportion to the extent of space occupied, and that, therefore, all space in the British Section will now be granted free of change.—I am, yours, &c.,

H. T. Wood, *Secretary.*

Society of Arts, John-street, Adelphi, W.C., April 19, 1892.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Will exchange Dallmeyer's 2c Baby lens (very rapid) for stylish studio accessories.—Address, Dagay, Stowe, Bedford.

Whole-plate portrait lens by Lerebour in exchange for cabinet lens by good maker.—Address, Artist, 65, Dale-street, Batley Carr.

Will exchange two full-size backgrounds, nearly new, for cabinet portrait lens (short focus).—Address, 21, Station-street, Sittingbourne.

Wanted, rapid rectilinear for 15×12 landscape by Ross, seventeen inch focus.—Address, E., 7, Forest Hill-road, Peckham, London, S.E.

A light and portable 12×10 camera, with two double backs, in exchange for complete half-plate outfit.—Address, 21, Station-street, Sittingbourne.

I will exchange a rectilinear lens, nearly new, for two backgrounds, interior and exterior.—Address, A. H. Scholes, 148, Shawclough-road, Rochdale, Lancashire.

Will exchange an enlarging apparatus with pair of seven-inch condensing lenses [illegible]'s, cost 6*l.* 13*s.*, for 12×10 landscape camera.—Address, W. K., 104, Terminus-road, Eastbourne.

Wanted, a strong, whole-plate studio camera stand in exchange for a "Vogel" cabinet and whole-plate portrait lens, or twelve-inch burnisher by "Vevers."—Address, Hughes, photographer, 26, Caroline-street, Cardiff.

12×10 camera, with two double dark slides, in exchange for complete half-plate outfit; also two full-size backgrounds (interior and exterior) for cabinet portrait lens or studio accessories.—Address, H. Wakefield, 21, Station-street, Sittingbourne.

Superior quarter-plate mahogany camera, all movements, three double dark slides, 5×4 rapid rectilinear lense, in leather case, quite new, cost 7*l.*, exchange for "Ideal" hand camera.—Address, J. Stevens, 89, Balcombe-street, London, N.W.

Wanted, a press for cabinet and cartes (enshion dies) in exchange for whole-plate view lens, also quarter-plate portrait lens and camera for a retouching desk with reflector and drawer from quarter to 10×8.—Address, Jas. Hurnott, 8, Castle-gate, Berwick-on-Tweed.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

1, 2, 3.—Apply to a dealer.

AUGUST BAER.—Received with thanks.

Z. K.—Cresco-fylma is the subject of a patent.

BROMO-CHLORO.—We do not know of any method of restoring the energy of a used pyro developer.

C. H. J. (Chicago).—The fewer the reflecting surfaces in a lens, the more rapid ought to be the exposure.

ILIAD.—We should recommend you to repeat the experiment, and pay greater attention to the directions given in the paper.

ILEX.—No; chemically pure chloride of sodium is not necessary in precipitating silver nitrate as chloride, although preferable.

R. W. A.—From the description given, the mottling arises from the plates not being "rocked" sufficiently during the development.

T. WARREN.—Unless we saw some of the examples, it would be impossible to help you. The details furnished are contradictory in themselves.

A. A.—Write personally to the manager. Your letter was, doubtless, replied to by a clerk who knew nothing of the technical part of the business.

ALTON.—Perhaps the better plan for you to pursue would be to apply a weak reducing solution to the negative, to remove the veil, and then intensify it.

PHOTOGRAPHER (Burton-on-Trent).—There is only one nitrate of silver, and not two. If you order that, you will get the right article for making dry plates.

WHITE LEAD.—We should not apprehend any deleterious effect on your silver prints arising from the use of white lead in making good the joints of the wood diah.

A. G. C.—You seem to have done everything to discover the cause of the foggy appearance of your plates except one thing, and that is, to examine your camera and slides for "light-tightness."

J. M.—If you will consult the articles by Mr. W. B. Bolton at pages 260, 308, 325, and 356 of this JOURNAL for 1888, you will find complete information on the subject of gelatino-bromide opals.

C. C. W.—The lenses of the retired dealer named were made, in many instances, by Darlot, of Paris. But, from the marking on the mount of yours, it is probable it was made by Coiffier. It is likely to be a good one.

BROMO.—If, as you say, the bromide paper has deteriorated so much in sensitiveness, we should think it was due to the fact of its having been kept, to quote your own words, "in a room where no fire had been during the past winter." Evidently the paper got damp.

BRICK.—Ready-made one-solution developers are useful enough in their way, provided your exposures are uniformly correct. Despite this, however, we question whether many professional photographers employ them; they, no doubt, preferring their reducing agent, alkali and restrainer separate, as each has separate functions to perform.

A. Q. (Napier, N.Z.).—1. The paper has evidently become deteriorated by long keeping, and possibly by the absorption of moisture. We fear there is no remedy. The remedy quoted is only applicable to the kind of paper referred to. 2. The formula is as given by the author. The method of compounding was fully described in the paper published in the JOURNAL.

A. W. W.—A ten-per cent. solution of bichromate of potash is much too strong for sensitising carbon tissue. One of three and a half at this season of the year is quite strong enough. Five per cent., with a short immersion, can be used, but this strength is of no advantage except under very exceptional circumstances. The bichromate of soda is not so suitable as the bichromate of potash.

JOHN HART.—By the time the print reached us it had become so discoloured that it was quite impossible to hazard an opinion as to the cause of the trouble. We surmise, however, that it arises from want of care in sensitising. Avoid dust on the surface of the paper, and see that none is on the solution at the time of floating. Also try a stronger bath—say, sixty grains—and a shorter time of floating.

A. C. H.—For enlarging by either artificial or daylight probably the following method will answer your purpose:—Salt plain paper with sodium chloride, 100 grains; hydrochloric acid, 6 minims; water, 12 ounces. Immerse for 2 or 3 hours, dry, and sensitise on silver nitrate, 1 ounce; citric acid, 8 grains; distilled water, 8 ounces. Dry, expose, and then develop the faint image with pyro, 2 grains; citric acid, 1 grain; water, 1 ounce. Wash, and fix as usual.

T. FRENCH says he has secured a snap-shot of a very important personage. The negative, though very good as a negative on the whole, does not show what might be called a good portrait of the illustrious nobleman, such as one that could be taken in the studio. He has made the picture copyright, and asks how he, being an amateur, can "turn the negative to account," adding that, no doubt, a professional, by retouching, could make the portrait a good one.—All we can suggest is that our correspondent take his negative to some of the publishing houses, and offer it for sale. But, unless it is far better than, from his letter, we surmise it is, we are doubtful if he will meet with much success.

LANCS asks: "What is the practice in London with regard to resittings? Are they given *ad lib.*, or are they charged for, always supposing that the photograph is a good one?"—This is such a purely business matter that we can scarcely offer an opinion. So far as we are aware, there is no rule, and every artist, as a matter of business, consults his own interest. With regard to the question being taken up either by the Photographic Convention or the National Association of Professional Photographers, it certainly does not come within the province of the former, and we doubt whether the latter would care to deal with it, seeing that they could not control the whole trade, even if they could their own members, which is a little doubtful.

H. B. H. writes: "The front of my 7¼×4½ stereoscopic camera is *pierced* for centres of lenses three and a quarter inches apart. Will you kindly tell me at what distance apart should the centres of transparencies be *mounted* so as to see them properly in the stereoscope? To my sight, with three and a quarter lantern plates, they will *not* combine, whereas, with paper prints taken from the same negative, but cut down to two seven-eighths, and one-eighth apart, they *will*. Is there any rule for this?"—In reply: No matter at what distance the lenses of the camera are mounted apart, the centres of the component parts of a stereoscopic picture should not, where possible, be more than two and three-quarter inches apart, and should never exceed three inches. It is quite immaterial how high the picture should be, but in width the limit is restricted. There is no rule that can be adduced beyond this, that the width of the eyes apart is the determining factor by which it is regulated. Hence a pair of lantern slides of standard size could not readily be brought into coalescence by ordinary eyes; we are now assuming, of course, that the ordinary stereoscope is employed. You will find this subject treated with a fair degree of fulness in the editorial article in our ALMANAC for 1877.

A NEW Camera Club has just been formed at Lincoln, and, in proof of its activity, we understand that there is a probability of the fine collection of English photographs recently on view in Brussels being brought, under its auspices, to Lincoln for exhibition there. It will be remembered that a local artist, Mr. R. Slingsby, is one of the exhibitors, and he is taking a foremost part in the endeavour to bring the collection to Lincoln.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—April 28, *The New Platinotype Paper*, by Mr. W. H. Smith; demonstration. May 5, Adjourned Discussion on *Wet Collodion*.

PHOTOGRAPHIC CLUB.—April 27, *The Use and Abuse of Yellow Screens in Orthochromatic Photography*. May 4, *Hand Cameras up to Date*. Outing, Saturday next (April 23), Wanstead Park. Train from Liverpool-street at 2.40.

DEATH OF MR. JOHN DUGDALE.—The death has occurred of Mr. John Dugdale, photographer, of 7, The Corridor, Bath. Mr. Dugdale was a native of Lancashire, but went to Bath in 1858, when he commenced business in Broad-street. Shortly afterwards, when opportunity offered, he removed to The Corridor, where his business has been carried on ever since. He was very widely respected, and, although he held no office in the Photographic Society, took a deep interest in its proceedings, and was never happier than when doing something to add to the attractive and interesting nature of its gatherings. As late as March 30 he attended a meeting, and took part in the discussion that followed a paper read by Mr. Appleby. For the last few days he had been unwell, but recently more serious symptoms supervened, to which he succumbed. He was fifty-six years of age, and leaves a widow and three children.

AT the recent Annual Spring Meeting of the Institute of Naval Architects, Mr. A. F. Yarrow read a paper on *Balancing Marine Engines and the Vibration of Vessels*. We learn that one of the most interesting features of the lecture was the photographs of torpedo-boats thrown on the screen by the lantern. The boat was moored in the West India Docks, so as to get still water, and a calm day was chosen. The propeller was removed, so that the engines ran free. The first photograph was taken with the engine in its ordinary condition, no bob-weights being attached. By previous experiment, the number of revolutions that caused the most vibration had been ascertained; 240 per minute was the number, and the engines were run at that speed. The boat was therefore caused to vibrate excessively, and the effect was clearly shown by the waves or ripples thrown off from the side. These were beautifully marked in the photograph, the pattern caused by the intervening wave series being very curious. Many pictures were given illustrating various wave phenomena due to different combinations, one of the most interesting being that in which vibration was caused by one of Mr. Yarrow's assistants springing on the stern 240 times a minute, an athletic feat of no mean order, and one which required considerable training. Another series of photographs taken broadside very clearly showed, by means of the wave motion, the nodes of vibration due to the period, the straight and the broken water-line being well defined.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1669. Vol. XXXIX.—APRIL 29, 1892.

THE NEW CONCENTRIC LENS.

Among the innumerable lenses produced daily in the ateliers of the optician one will search in vain for any in which the application of a new principle of construction is involved. Changes have been rung upon pre-existing discoveries, and improvements, in some cases of great value, have been made, but it is long since any novelty in principle has been imported into the art of lens-manufacture. Happily we are now able to record the advent of one in which a new principle of great practical value has been introduced.

We have on previous occasions spoken of a patent new "concentric" lens of Messrs. Ross & Co., which was being constructed from formulæ by Dr. Hugo Schroeder, the mathematician of the house. Although the patent was completed in 1889, the lens could not be commercially produced before, in consequence of the difficulty of always obtaining the exact qualities of special glass required in its construction. This delay, however, has afforded ample time to test the glass, which, after three years, shows no deterioration.

Notwithstanding our having already given an account of the optical principles involved in, and described the construction of, the lens, we think it well to refer briefly to them again. And first we would observe that, in external appearance, it is nearly identical with the well-known "Portable Symmetrical" of this firm; but, if the lenses be critically examined, it will be found that, while each of those forming the symmetricals has its convex surface of a shorter radius of curvature than its concave surface—a condition of things absolutely necessary in all positive combinations of flint and crown glass—in the "concentrics" the reverse condition prevails, for the concave surface is of shorter radius than the convex. Both surfaces have one common radial centre, and are therefore concentric, hence the name.

Physicists are, of course, well aware that such a condition as that above described could not possibly be fulfilled with the ordinary optical glass formerly at our disposal, because of the flint possessing not only greater dispersion, but also greater refraction, than its crown partner. The construction of a concentric positive lens was, therefore, impossible until the Abbe-Schott glass of Jena was made available. And among the various classes of this new glass were some corresponding to our crown and flint, but in which the former had a higher index of refraction than the latter. The construction of the new lens may be stated thus: It is composed of two similar or symmetrical achromatic combinations, each being formed of two simple lenses, a plano-convex of glass of a high refractive and low dispersive power, cemented to a plano-concave of a lower refracting index, but of the same, or preferably of a higher, dispersive power, these being cemented at the two flat surfaces.

On theoretical grounds, we stated, three years since, that a combination thus formed ought to give such an elongation of the oblique pencils as to yield a flat field with good marginal sharpness; and, now that its commercial production is *un fait accompli*, we have witnessed in the new factory of Messrs. Ross & Co. a series of tests to which it has been subjected, by which this hypothetical conclusion has been fully established.

The demonstration established the fact that the new lens, with an aperture of *f*·20, covered an area of large angular magnitude (over 60° on the base line and about 80° on the diagonal) with great sharpness. The subject tested was a watch dial, the image of which, together with those of an adjoining lamp flame and an artificial star, were examined through a powerful eyepiece from positions both central and oblique to the axis of the lens. To enable this to be effectively accomplished, both the dial and the eyepiece were made to move over a considerable distance at a right angle to the axis of the lens, and observations could thus be, and were, made at various successive stages, representing inches on the ground glass of the camera, from the centre to the side of the field. The definition was uniformly excellent throughout, establishing the fact that not only was the concentric lens anastigmatic, but that it had a perfectly flat field.

How, it may be asked, does the new lens behave when removed into the field and away from the optician's test room—a comparison some might think similar to that as between a laboratory experiment and a manufacture on a large scale? We can reply: Having placed the lens on our own camera and subjected it to the test of landscape experiment, we found, on applying it practically to the reproduction of familiar outdoor scenes containing numerous objects long used as tests, that when focussing the centre of the plate (a 10 × 8 one, the focus of the lens being eight inches), and employing a magnifier of great focal power for the purpose, there was absolutely no difference in definition between the centre and the margin, that the illumination was even, the depth of definition great, and the perfection of the image all that could be desired. The exposed and developed plates resulting affirm this in a lasting form.

Not only for landscape and architectural work but to those who have to make sharp copies of maps and similar cartographic subjects we cannot conceive of anything more perfect, as marginal sharpness is secured without the necessity, hitherto existing, of stopping down to a light-destroying aperture.

The "concentric" must prove a great boon to the photographer who has, with ordinary lenses, to have recourse to very small diaphragms in order to get perfect sharpness at the sides of his picture, more especially if a wide angle of view is included, and we cannot but give it a hearty welcome as a useful addition to our picture-making and copying resources.

We cannot close without bestowing our tribute of praise on

Dr. Schroeder, although praise of such a man, who has so long been recognised as one of the foremost mathematical opticians in the world, is superfluous, and to the firm of Messrs. Ross & Co., to whose enterprise and initiative the introduction of the lens is due.

DEVELOPMENT OF PARTLY PRINTED PROOFS, LANTERN SLIDES, AND OPALS.

Since introducing to the notice of our readers Valenta's method of developing up to full intensity under-printed proofs on collodio and gelatino-chloride emulsion papers a fortnight ago, we have had an opportunity of submitting the plan to practical tests, and are pleased to be able to confirm all that Herr Valenta has said of its efficacy. The growing popularity of printing-out emulsion papers convinces us that the advantage of being able to complete prints as rapidly in dull as in fine weather is likely to find wide appreciation, especially among professionals; and when it is remembered that in this case development does not, as usually understood, mean the conducting of the operation in the dark room, but that it may be performed in subdued or shaded daylight, one of the drawbacks inseparable from all development processes is removed.

New processes and modifications of old methods not infrequently dismay the photographer by involving the employment of specially prepared developers and other solutions differing from those in common employment—a natural reluctance to undertake the trouble of arranging the preliminaries often lying at the bottom of the neglect and coldness with which novel processes are at the outset generally received. In the present case, however, though Herr Valenta directs the use of an acid instead of an alkaline developer, a glance at its composition (see page 248, *ante*) will assure the photographer that, in all probability, he will have it among his preparations, practically ready mixed and only awaiting dilution. In our own case, we employed a stock solution, which we very frequently use for negative purposes, as the basis of the developer.

In taking prints on two English emulsion papers, samples of which we happened to have by us, we were careful to remove the pictures from the frames so soon as the deep shadows and a faint impression of the half-tones were visible—the prints having a complete absence of details, and, indeed, being but very faint impressions produced by an exposure of about two minutes in diffused sunlight. They were treated with a developer made up, from a stock solution, in the following proportions:—

Pyro	5 parts.
Soda sulphite	25 „
Citric acid	10 „
Water	1000 „

The pyro and sulphite were, of course, taken from the stock solution, the citric acid being added after dilution.

In this solution development was from four to five minutes in starting, and then the weak, purplish pictures gradually acquired a sepia tint, which next developed into a positive brown shade, and then, growing in depth and vigour, gradually passed into a most rich, heavy purple colour, the whole operation lasting perhaps ten minutes. By the time the latter stage was reached, the whites, of course, were so considerably degraded as to render the prints useless, but in the ordinary method of working, development would be stopped long before this stage was reached. For subsequent toning in a combined toning and fixing bath, we afterwards found that the stage at which development should be stopped and the print washed, was when the image had acquired the decided brown tone of which we have spoken.

The chief element of success in the method, however, struck us as being the wonderful degree of power which the developer possesses over the qualitative character of these weakly printed images. Not only does it build up the shadows to full intensity, and render the scale of tones as completely as if the full print had been taken in the frame, but it brings out the utmost fineness and delicacy of detail without setting up coarseness or granularity. Moreover, it must not be imagined that the developer only acts on those parts of the picture where the faint impression visible to the eye has been formed; on the contrary, it brings out a considerable part of the image which is invisible, thus fulfilling the functions of a developer of the latent image in the ordinary sense. Indeed, we believe that eventually this paper will be susceptible of exposure in the printing frame in the usual way without the necessity of any part of the image being visible before development; and hence considerable rapidity of working will be assured. We are experimenting in this direction, and at some future date will describe the results.

Continuing his attempts with developing weakly printed images on printing-out surfaces, Herr Valenta, as will be seen from his communication in our present number, describes the application of acid developers to the development of faint images on glass for lantern slide, opal, and transparency work. The comparatively small extent to which printing-out surfaces for these kinds of work are employed in this country does not render the application so valuable as in the analogous case of paper prints, but possibly it may lead to a greater practice of the plan recommended by Valenta. We shall recur to the subject.

ON SPOTTING.*

Regarding the treatment of the negative itself, we might be expected to write upon the use of the knife, an operation now of great importance; but, to avoid our brief comments developing into a treatise upon the methods of retouching, their scope must preclude more than a brief allusion to such work. It is carried out both by the knife and the needle, some being more expert with one than the other. We may say that a specially made knife, advertised for some time past in the business portions of this Journal, has been in our hands most successful, taking the place of both needle and knife, one end being sharp, and the other more scoop-like. When spots have been removed by one or the other means, the surface is apt to become too uneven to work upon readily with the brush for final smoothing, and here the employment of Indian ink will be found very valuable, our warning to avoid using saliva to moisten brush or colour being remembered. Let it also be well borne in mind that, when more than a single print or two is required, it is far better to do as much of the work on the negative as possible. It is true a retoucher's labour is far better paid than a spotter's; but a very little time spent upon a negative may, in the aggregate, prevent loss of the labour of the spotter upon the prints.

Coming now to the spotting of the prints themselves, the ground is more familiar, for there are few who have not, at one time or another, to remedy defects of the kind.

* Concluded from page 241.

We may say that there are many instances where unnecessary work is made for the spotter. We allude to dirty negatives. In the course of printing a number of copies, it is almost inevitable that particles of dust and foreign matter generally fall upon the varnish, and have an unpleasant knack of adhering. The use, therefore, of a fairly stiff brush to "sweep" the negative each time a fresh piece of paper is filled in should be an imperative rule in all printing operations.

The usual way of removing white or ·ht spots is to stipple upon them in water colours of the exac ·nt of the print. This is too often carelessly done, the resul ·oeing that, through imperfect matching, the stippling becomes quite prominent. Often is this caused by the stippler mixing a batch of colour, and using the same pigment for all shades of colour in the prints. Such carelessness should not be permitted. A stock mixture may be made, and allowed to dry, for use as required, upon the palette, but it should be modified by the addition of colder or warmer colours, as the tint of the print may indicate. A common mixture is Indian ink, indigo, and crimson lake. Madder brown is used also by many, and forms a useful basis; but we would here interpose a word as to the fugacity of the pigments used. It is true that many prints fade before any alteration of the spotting, but not always is this so; and it should be the aim of every upright photographer to make every part of his work permanent. To this end, we say eschew crimson lake; it is bound to give way. The madders are better, but uncertain. For setting the palette, our recommendation is to take the new alizarine crimson, indigo, Indian ink, and Vandyke brown. There need then be no fear as to the pigments ever giving way, even if used on permanent prints. When the colours are used on platinotypes or other unglazed surfaces, the colours as found in the colour-box will be suitable; but, when albumenised prints are to be spotted, it will be found necessary to use a very copious addition of solution of gum arabic. Without this precaution the pigment will dry with a dead surface, and greatly mar the effect of the finished print. To the inexperienced it will be surprising what a large amount of gum is needed; and, the deeper the colour, the more the gum has to be increased.

The greatest trouble will be experienced when endeavouring to spot out dark spots. As a matter of fact, there should not be any such to remove, for the negative itself should be first treated, and all marks of this kind removed. If, however, it be desired to remove any marks of the kind, the only plan—a makeshift at the best—is to use Chinese white. But it will be found necessary to mix it on quite a different principle to the dark colour. The plain white is inadmissible, it dries up to such a cold tone. It will be found that there must be added to it a red—light red or alizarine crimson, or both—till upon the palette it appears quite pink. For platinotypes and other similar surfaces, coloured chalks will be better than water-colour for opaque colour, and, indeed, some photographers use them for dark spotting also, to the entire exclusion of water-colour pigments.

We have now covered the entire ground, and, if we have left untouched any difficulties that have been experienced but not surmounted by others, we shall be glad to supplement our remarks by information in the usual column for correspondents.

Illegal Photographs.—Evidently the traffic in indecent photographs, like that in photographic piracies of works of art, is not yet suppressed. Last week two persons were committed for trial, and a third remanded, for dealing with the former. Photographic copies of some of the most popular engravings are freely hawked about the streets. The difficulty encountered in stopping this class of work is that of reaching those who produce the negatives. Usually the prints pass through several hands before they get to the retailer.

The Zeiss Lenses.—In reference to the Zeiss Anastigmat lenses, it may be of interest to point out that Messrs. Ross & Co. are among the few licensees of the firm of Messrs. Carl Zeiss & Co., of Jena, holding authority to manufacture the lenses in accordance with the terms of the patent. It will be remembered that the number of the licensees is limited; Messrs. Ross's rights of manufacture extend over the British empire, they being thus the only English house licensed. We understand that they will shortly place several of the Zeiss series of Anastigmats on the market.

Death of an Astronomer.—Every one will hear with regret the sad and fatal accident that befell Mr. John Hartnup, the well-known astronomer, at Bidston-hill Observatory, one day last week. While the unfortunate gentleman was examining some meteorological instruments at the summit of the building he overbalanced himself and fell to the ground below. Death was instantaneous. Mr. Hartnup had a wide reputation as a scientist, particularly in connexion with meteorology. He and his father had been connected with the Bidston-hill Observatory for nearly half a century.

Indian and Colonial Slides.—The set of Indian and Colonial slides now going the round of the Societies affiliated to the Photographic Society of Great Britain are, both topographically and photographically, of the highest interest. We can imagine that photographic societies in the Colonies and India would give as hearty a welcome to a good selection of slides of home scenery as that which has been extended to these Cape, Tasmanian, and Indian pictures. It would be a graceful way of returning the compliment, and we hope that the matter will be taken in hand by the Affiliation Committee, as we are confident several good sets might be made up from the contributions of the various Societies.

An Old Process.—Photo-typographic blocks are rapidly ousting wood engravings from the field for illustrative purposes. The majority of the blocks are produced by spreading a thin coating of bitumen on a metal plate, exposing it to light under a *cliché*, dissolving away the unaltered portions with a suitable solvent, and then etching the bare parts with an acid, leaving the others in relief to form the printing surface. Now, it does not seem to be generally known that this was precisely what was done by M. Niepce just sixty-five years ago. He coated a metal plate with a solution of bitumen in oil of lavender, and exposed it to light either in the camera or by super-position. The image was then developed with a mixture of oil of lavender and benzol. The plate was afterwards bitten in with acid.

The Convention.—It will be seen by a letter from Mr. Combrano, the Honorary Secretary of the Photographic Convention of the United Kingdom, which we print elsewhere, that even thus early papers by such excellent men as Bothamley, Robinson, and Pringle have been promised for the Edinburgh meeting, while Miss C. W. Barnes is also on the list for a subject of which she should have the best possible opportunities of arriving at a good idea. Looking at the fact that the gathering is largely of a holiday character, and that a great deal of matter has to be digested within a little time, may we humbly hope that the authors of papers will remember the relationship which brevity bears to wit? In former years there have been some good papers at the Convention, but the length of some of them was in precise proportion to their value.

The Half-holiday Movement.—Reverting to the announcement we made last week, that all the leading photographers in

Glasgow had agreed to close their businesses for half a day in each week in order to give their *employés* a holiday, it seems a little strange that the whole of them do not close on the same day of the week. As it is, some will be open while others are closed, and this may possibly lead to business that would have gone to one establishment that is closed going to another that happens to be open. Of course our Glasgow friends know their own business best, and doubtless they have a good reason for their present arrangement; but to many it seems anomalous that the day for closing was not made universal throughout the town. However, the assistants are to be congratulated; and, as we said before, we hope other towns will quickly follow suit, including our great metropolis.

An Innovation.—It is so difficult to get up anything in the shape of a novelty at the meetings of Societies nowadays that a little incident which occurred at the South London Photographic Society the other night appears to us to have all the charm of originality about it, and, being original may, perhaps, lead to imitation. It appears that the Chairman demonstrated the new cold-bath platinum printing process, and at the conclusion of the demonstration a number of, no doubt, very excellent prints remained. Probably the Chairman had no further use for these prints—did not wish to take them away with him, or did not want them, it is hard to tell which. At any rate, in his dilemma, he put them up for sale, the result being that they realised a sum of 3*l.*, which was swept into the coffers of the club. We have heard it said that photographic societies are being rapidly turned into mere advertising mediums; now it seems they are becoming vehicles for trading.

Process Blocks and Photogravures.—It would seem, from an article that we reprinted from *Anthony's Bulletin* in our previous issue, that, in America, impressions from phototypic half-tone blocks were being foisted upon the public as photogravures, inasmuch as the writer points out very clearly how the one may be distinguished from the other. We are free to admit that "process blocks" are made to great perfection in the States, but we have seen none—and we have seen some of the very best—that would for a moment, in this country, be mistaken for a photogravure, that is an impression from an intaglio plate, even by the most casual purchaser. There is a depth, richness, and perfect gradation in an intaglio, photographically engraved, plate, that at present cannot be equalled in a typographic block however skilfully produced. The writer mentions that, with a process block, an office boy can "kick off" a thousand impressions a day, but an experienced intaglio printer cannot produce above two hundred good ones per diem. As a matter of fact, we may say that with some of the large intaglio plates now produced on the Continent not more than twenty or thirty impressions a day are made, so much care and attention is devoted by the printer to the inking in and wiping out of the plate in order to secure the excellent results that are issued.

Processes before their Time.—In connexion with the above subject it may be mentioned that the method of breaking up the tones of a subject into lines or dots to obtain a printing plate was first practised and patented by Fox Talbot forty years ago. He, about the same time, produced intaglio plates by etching through an exposed bichromated film, a granular surface being obtained by a powdered resin. Practically, this is the method now almost universally employed for "photogravure." Some of Talbot's work will still hold its own against many untouched plates of the present day. Half-tone surface blocks, and good ones too, were produced by Pretch in 1855, and as far back as 1866 Bullock Bros. produced photo-lithographs in half-tone that were quite equal to those now made. Hence it will be seen all that is now being done was done many years ago. This being the case, it may justly be asked why all these processes lay dormant so long. The only answer is, that they were introduced before their time. Their value was not recognised, and they were not therefore appreciated. These are not the only processes in connexion with photography that have been introduced too soon, and afterwards reintroduced later on with success.

A Novel Glass House.—"Those who live in glass houses should not throw stones," says an old aphorism. But who would wish to live in a glass house, if it be of the type of some photographic studios, it is difficult to conceive. However, a glass dwelling may possibly be made comfortable. According to an evening contemporary, the King of Siam has had a pavilion built of glass; walls, floors, and ceilings are of slabs of glass, the joints being made with an impermeable cement. The door is made to close hermetically. The roof, we are told, is provided with ventilators in tall pipes. The building stands in a large reservoir, and becomes submerged in water by opening a sluice at the side of the latter. In this transparent edifice the King is said to find a perfectly cool habitation in which he spends a great portion of his time. If the thing be true, this is certainly a novelty in glass houses, and must be in strong contrast to those generally used for photographic purposes in hot weather. By the way, it is somewhat surprising that so little is done in artificially cooling studios during the summer months. If a pipe perforated with small holes, and connected with the water supply, were fixed along the ridge of the building, a number of fine streams could be made to trickle down its roof and sides. This would keep the studio pleasantly cool even in the hottest weather, and thereby often conduce to more pleasing portraits. Some studios we know are thus provided, but their number is very limited.

THE CHEMICAL CHANGES ATTENDING PHOTOGRAPHIC OPERATIONS.

I.—The Theory of Development in relation to the Essentially Electrolytic Character of the Phenomena and the Nature of the Photographic Image.

[Camera Club Journal.]

No pretension to be even a professional amateur photographer is made by the writer of these lines. At intervals extending over a considerable period he has exposed and developed plates in a conventional and rule-of-thumb manner, but about a couple of years ago an awakening of his photographic conscience took place, and he began to ask himself whether he had any true understanding of what he was doing. Finding that he had not, and that the text-books afforded but cold comfort, he bethought him that he was working in a manner utterly unworthy of a member of that fraternity which seeks to give its meaning to the watchword by which it is led—Science: "Knowledge co-ordinated, systematised, and arranged."

To-night he will attempt but a very general confession of the faith that is beginning to arise within him after much pondering over photographic literature, and after a couple of years of study and experience of the behaviour on development of plates exposed in the field at all seasons, and under a considerable variety of conditions, one chief object in view having been to arrive at the explanation of the controlling influence exercised by the restrainer, and the accelerating effect of alkali.

Thus much by way of preface. A prologue may be added to facilitate the explanation of points of fundamental importance.

In the year 1868 De la Rue and Müller described a new form of voltaic cell, consisting of a cylinder of silver chloride cast around a silver wire as negative element, opposed to a zinc rod as positive element, placed side by side in a tube containing a solution of a chloride, ammonium chloride being that ultimately preferred. [It is worth while noting that they speak of silver chloride as so poor a conductor of electricity that it may be regarded as an insulator, and that on this account it is necessary that the silver wire around which the chloride is cast should project through it into the solution. On the other hand, it is also noteworthy that even solid silver chloride may be electrolysed, and that directly its temperature is raised sufficiently to make it viscous, it is an exceedingly good conductor.] In such a cell the silver chloride remains unchanged until the circuit is completed, by joining the zinc and the silver by a conductor of electricity; immediately this is done a current passes, and simultaneously zinc dissolves, and silver chloride becomes deprived of chlorine. Although ammonium chloride is used in the cell, in considering the nature of the interchanges, it is permissible to assume that hydrogen chloride—one of the constituents of ammonium chloride—is the active agent; for, as will be shown later on, at the same time that hydrogen chloride is being withdrawn from ammonium-chloride and used up, hydrogen chloride is being produced and converted into ammonium chloride, and, as the two actions balance each other, it is unnecessary to consider them.

Supposing that silver, and not silver coated with silver chloride, were opposed to the zinc in the cell, the latter would dissolve as chloride, but hydrogen would be given off at the surface of the silver. In this case the current would rapidly fall off, the cell would become *polarised*, in consequence of back action setting in between the hydrogen coating the silver and the zinc chloride, which would lose chlorine. As it is reversible, the change occurring under such conditions may be written—

$$Zn + 2\,HCl \rightleftharpoons Zn\,Cl_2 + H_2$$

i.e., the equation may be read either backwards or forwards. In the

presence of silver chloride in contact with the silver, this back action or polarisation is prevented, no hydrogen ever being set free, as at the same time that the zinc combines with chlorine from the solution an equivalent amount of hydrogen combines with chlorine of the silver chloride, and thus the amount of chlorine as ammonium chloride in solution is maintained constant. We, therefore, may represent the state of affairs in the cell before and after the current passes in the following manner:—

Zinc plate	ClH	ClAg	Silver plate
	ClH	ClAg	

Cell at Rest.

$$= \text{Zinc plate} \;|\; Zn\begin{matrix}Cl\\Cl\end{matrix} \;|\; \begin{matrix}HCl\\HCl\end{matrix} \;|\; \begin{matrix}Ag\\Ag\end{matrix}\left\{\begin{matrix}\text{silver}\\\text{plate}\end{matrix}\right.$$

Cell in Action.

The electrical pressure developed in such a cell—its electromotive force, or E.M.F.—is about 1·05 volt; the theoretical value may be calculated in the following manner:—

It is known from thermo-chemical measurements that the dissolution in dilute muriatic acid (HCl : H_2O = 1 : 200) of sufficient zinc to displace two grammes of hydrogen would involve the evolution of 34,200 gramme-deg. C.-units of heat.

If this amount of hydrogen and the equivalent amount of chlorine were to interact, and form hydrogen chloride, 78,640 units of heat would be liberated; while by the interaction of the equivalent amounts of silver (216 grammes) and chlorine, only 58,760 units of heat would be liberated. Consequently, 78,640 − 58,760 = 19,880 units of heat would be developed if the hydrogen, instead of being liberated, were to reduce silver chloride, and the total heat evolution resulting from the conversion of the zinc into chloride at the expense of the chlorine withdrawn from the silver chloride would be 19,880 + 34,200 = 54,080 units. The corresponding E.M.F. is found by dividing by 46,000, a constant which need not be explained here; hence—

$$\frac{54{,}080}{46{,}000} = 1{\cdot}18 \text{ volt.}$$

The difference between this and the observed value is attributable to the fact that the conditions for which the calculation is made are not precisely those which obtain in an actual cell; probably the zinc chloride is not fully hydrated in the electrical circuit, and the heat of formation of some less hydrated chloride should be taken for the purpose of the calculation.

The extent to which electrolysis of silver and hydrogen chloride takes place, *i.e.*, the amount of zinc dissolving and of silver chloride reduced in the cell depends on the resistance in the electrical circuit, since—

$$C = \frac{E}{R}$$

where C stands for current, E for electro-motive force, and R for resistance. This is the well-known *Ohm's Law*; its importance in connexion with photographic phenomena has been strangely overlooked.

To apply this law to chemical changes, it has merely to be borne in mind that C may also be taken as meaning amount of chemical change, and it is scarcely necessary to point out that the most exact method of measuring an electrical current consists in determining the amount of chemical change which the current produces, by weighing the deposit of silver obtained on passing it through a silver nitrate solution. E, as before, is the electromotive force corresponding to the interchange, and R the resistance, not of the liquid as a whole, however, but of the circuit within which the interchange is effected, which may be quite a different thing, and unfortunately at present is beyond measurement.

It will be noted that the E.M.F. of the silver chloride cell is the sum of two E.M.F.s, the one developed in the formation of zinc chloride from zinc and hydrogen chloride, the other in the reduction of silver chloride. In any case, in order that action may occur, it is essential that the change, on the whole, be one in which energy is set free; but this is not necessarily the case in all parts of the change when it is resolvable into parts. This is a consideration of primary importance in connexion with the theory of development, and may be illustrated by the following examples:—Zinc readily dissolves in diluted sulphuric acid, if coupled with a less positive conductor. Copper, however, does not, even if the acid be boiled; but copper dissolves readily enough if oxygen be passed into the heated diluted acid. Thermo-chemical measurement shows that, while the dissolution of sufficient zinc to displace two grammes of hydrogen from sulphuric acid is attended with a liberation of energy expressed by the number 37,730 if represented in heat units, the dissolution of the equivalent amount of copper could only take place if energy were supplied to the extent of 12,400 heat units; but, as oxygen and hydrogen interact, forming water, with liberation of energy to the extent, measured in heat units, of no less than 68,360 units per two grammes of hydrogen, it becomes possible for copper to dissolve in sulphuric acid, in presence of oxygen in a circuit containing copper, sulphuric acid and oxygen, with development of energy equal to 68,360 − 37,730 = 30,630 heat units: *i.e.*, a positive E.M.F. is developed in such a circuit.

In the old collodion wet-plate process development was effected by means of silver nitrate left adhering to the plate on removal from the silver bath, and a reducing agent such as ferrous sulphate duly restrained by, say, acetic acid. When solutions of ferrous sulphate and silver nitrate are mixed, unless very dilute, a precipitate of silver is soon formed, but the amount precipitated always falls far short of the total amount of silver present, as the interaction is reversible.

$$\underset{\text{Ferrous Salt.}}{2FeSO_4} + 2NO_3AG \rightleftharpoons \underset{\text{Ferric Salt.}}{Fe_2(SO_4)_3(NO_3)_2} + 2Ag.$$

The extent to which silver is deposited depends on the proportions used the concentration, and the temperature; if the solution be sufficiently dilute and acid be present, no precipitation occurs. The exact function of the acid is not clearly determined, but probably in its presence atmospheric oxygen intervenes, and, by acting in conjunction with it and ferrous salt, further promotes the dissolution of the silver, thus rendering reversal complete, *i.e.*, no chemical change is apparent. There can be no doubt that in the liquid the interchanges thus pictured occur within voltaic circuits, and that, as no action is observed when acid is present, the algebraic sum of the currents in all these circuits is *nil*. It is to be supposed that on covering an exposed plate with such a solution the image acts like the silver rod in the De la Rue-Müller cell, silver nitrate taking the place of the silver chloride, and ferrous sulphate that of the zinc rod in the cell; hence the silver is necessarily deposited on the image.

The growth of the image in silver therefore takes place mainly upwards into the solution in the case of a collodion wet plate, and only to a minor extent within the film; it appears probable that the silver haloid particles in the film in contact with the image are but little, if at all, affected, owing to the superior readiness with which silver nitrate is reduced, and the "weakness" of the developers used. It is very noteworthy that, owing to the absence from collodion of "active impurities," its use affords little or no opportunity for the occurrence of changes at points where light has had no action on the film, hence the brilliancy and sharpness of wet collodion pictures.

In considering the alkaline development process of modern gelatine dry-plate photography, it would appear to be necessary to distinguish between methods in which the *alkaloid* ammonia and those in which alkalies, either caustic or carbonated, are used. Even silver bromide is appreciably soluble in ammonia; consequently, in developing with the aid of ammonia, the image is in part formed from silver in solution. The extent to which this takes place depends chiefly on the amount of bromide added as restrainer, one result of adding this restrainer being to precipitate the dissolved silver haloid, or rather to prevent its dissolution by the ammonia. Probably it is to this peculiarity that the marked difference in results obtained by using ammonia and pyro is, at least in large part, attributable; and the same circumstance would favour the formation of an image not wholly composed of silver, *i.e.*, of a species of pigment.

All who have worked with pyro and ammonia know that the picture has properties which distinguish it from those obtained with developers in which ammonia is not used, and that the liability to certain peculiar kinds of fog is special to ammonia developers; this is probably attributable to the conjoint action of the dissolved silver and colouring matter formed by oxidation of the developer.

When alkalies are used, the image grows at the expense of the solid silver haloid with which it is in contact, just as the silver wire in the De la Rue-Müller cell grows at the expense of the silver chloride cast around it. The various developers used, like zinc, are all oxidisable substances; and, just as the zinc by combining with chlorine enables the hydrogen of hydrogen chloride to withdraw chlorine from silver chloride attached to the silver wire in the cell, so the developer, by laying hold of the oxygen of water, enables its hydrogen to withdraw bromine from the silver bromide attached to the image on the photographic plate which has been exposed to light. Taking quinol (hydroquinone) as the type, the interaction may be expressed thus:—

Latent image	AgBr AgBr	$\begin{matrix}H\\H\end{matrix}O$	$\begin{matrix}H\\H\end{matrix}C_6H_4O_2$
	Silver Bromide.	Water.	Quinol.

$\rightleftharpoons$

Before Development.

Latent image	Ag Ag	BrH BrH	$O\begin{matrix}H\\H\end{matrix}$	$C_6H_4O_2$
		Hydrogen Bromide.	Water.	Quinone.

After Development.

Viewing the process in this manner, the function of the alkali would seem to be to neutralise the acid as it is formed, or rather, to prevent acid ever being formed, thereby preventing a reversal of the interaction which otherwise would take place, owing to the attraction of silver for bromine and of quinone for hydrogen, *on which account the equation given above is written as expressing a reversible change.*

But the remarkable positive influence of alkali in hastening development, and the retarding influence of a bromide, such as potassium bromide, are in no way accounted for in the foregoing explanation.

As regards the alkali, its influence is probably, at least in the main, due to the fact that a silver haloid in presence of alkali and a reducing agent tends to undergo reduction, the metal of the alkali forming a compound with the halogen, while the oxygen of the alkali forms water with th hydrogen of the developer. One of the products of this interchange i the alkali-metal haloid, *and, the interchange being a reversible one,* its re

versal is promoted by the presence of added bromide, and consequently less silver is deposited when the restrainer is present, thus:—

$$\text{Image} \left|\begin{matrix}\text{AgBr}\\ \text{AgBr}\end{matrix}\right| \begin{matrix}\text{KOH}\\ \text{KOH}\end{matrix} \left|\begin{matrix}\text{H}\\ \text{H}\end{matrix}\right.\text{C}_6\text{H}_4\text{O}_2 \rightleftharpoons$$

Alkali.

$$\text{Image} \left|\begin{matrix}\text{Ag}\\ \text{Ag}\end{matrix}\right| \begin{matrix}\text{BrK}\\ \text{BrK}\end{matrix} \left|\begin{matrix}\text{OH}_2\\ \text{OH}_2\end{matrix}\right| \text{C}_6\text{H}_4\text{O}_2$$

Provided it be assumed that the latent image is capable of acting in a manner corresponding to that in which the silver rod acts in the silver chloride cell, it is unnecessary to take its precise character into account. Yet, to fully understand the relative importance of the various factors operating during exposure and development, it is necessary also to consider the nature of the photographic image. For an able statement and discussion of this and of very many other photographic problems, reference may be made to Meldola's *Chemistry of Photography* (Macmillan & Co.).

It is now generally admitted, Meldola says, that the invisible image is of the same composition as the darkened product of photo-decomposition of a silver haloid, and he inclines to the belief that this darkened product is an oxyhaloid compound of silver.

Mr. H. B. Baker, whose name is familiar to chemists through his remarkable observations on the incombustibility of carbon and phosphorus in dried oxygen, has for some time past been studying this subject with special care, and it may be here stated, on his authority, that when darkened silver chloride is treated with chlorine it gives off oxygen, and that water is formed when it is heated in dried hydrogen; these observations clearly indicate that the darkened substance contains an oxidation product, and confirm Hodgkinson's results, to which Meldola has drawn attention.

But, if the arguments adduced in favour of the view that the invisible image is of the same nature as the darkened product be carefully examined, it will be found that they are by no means cogent. One object of this communication is to suggest that probably they are not; and, further, that in an ordinary photograph there are perhaps two distinct latent images behaving differently on development, which may be conveniently spoken of as the *blue* and the *yellow* image. It is contended that the blue image is silver, and only the yellow a silver oxyhaloid. The action of light on silver haloids is apparently strictly comparable with that of an electric current—it is *electrolytic;* moreover, the effect of light would seem to be that of a very high electromotive force, and it would therefore overcome great resistance. It may be supposed that when exposed to the mis-called actinic rays—those at the blue end of the spectrum—in contact with a substance capable of appropriating bromine, *i.e.*, a depolariser, such as gelatine and the products formed therefrom during ripening, silver bromide has its silver liberated. The development of the image thus formed has already been described; such an image would be the absolute counterpart of the silver wire in the De la Rue-Müller cell.

Lower down in the spectrum, in the yellow region, the silver bromide apparently undergoes electrolysis in some occult manner in a circuit which includes oxygen, and, while losing some of its bromine, takes up oxygen in place thereof.

In anticipation of the objection that if these two actions take place darkened silver haloid should contain both silver and silver oxyhaloid, and that apparently the former is not present in it, let it be remembered that, when a moist silver haloid is affected by light, the halogen liberated in the formation of the oxyhaloid will attack the silver which it is here supposed results from the decomposition of the haloid by the blue rays, and will convert it into silver haloid. In a gelatine plate, however, halogen is taken up by the gelatine, &c., and thus the silver would be more or less protected; after a time, the gelatine having become saturated, the silver would tend more and more to become re-halogenised; in fact, it would entirely depend on the length of exposure whether the image consisted of silver and silver oxyhaloid, or only of the latter.

On developing what is known as an over-exposed plate, which presumably is rich in oxyhaloid, the image apparently behaves very differently, according as only alkali is used in conjunction with the developer, or alkali and a bromide. It would seem probable that a silver oxyhaloid would resemble silver oxide in being very unstable, and that, in contact with alkali and a reducing agent, it would become resolved into silver haloid and silver, thus affording an image in silver, the growth of which, on continuing development, would occur in the manner previously explained. The decomposition of the oxyhaloid, like the change which occurs when solutions of silver nitrate and ferrous sulphate are mixed, would take place, so to speak, with a rush, and the image grows so rapidly that the picture would flash into view. One function of the restrainer is to prevent this sudden change; it would seem that under the conjoint influence of a bromide, alkali, and a reducing agent, the silver oxyhaloid is converted into silver haloid. The extent to which this change takes place, and the rate at which the picture gains in strength, would depend on the amount of bromide present, the relation which obtains between the amounts present of the several substances which act conjointly, the concentration, and the temperature; consequently the picture might, as is the case, be caused to grow at any desired rate.

In a gelatine plate there are always present substances tending to interact with the silver haloid in presence of alkali much in the manner in which silver nitrate and ferrous sulphate interact, and which promote the occurrence of the reduction of the haloid by the alkali and the developer already referred to. Such substances are kept under control by the addition of the restrainer. If, therefore, the development of an over-exposed picture be continued, fog is necessarily produced unless sufficient bromide be added to check the action of the reducing substances in the gelatine. For a similar reason it is desirable to use weak developers with plates which have had a very brief exposure. In such a case the image is so very faint that the difference between the unexposed and exposed portions of the plate is but slight—the value of R in the equation—

$$C = \frac{E}{R}$$

is very nearly the same in the two sets of circuits. By using a developer which has no appreciable action on the unexposed plate, the latent image is slowly strengthened, and ultimately R is so much diminished that it becomes safe to use a stronger developer.

The development of pressure marks may be explained from the same point of view. Clearly there would be a diminution of resistance in the lines of pressure, and hence, on application of the developer, circuits would be formed within the film in these lines, in which action would take place more readily than in the uncompressed parts.

Reversal by means of *thiourea*, with which we have been made familiar by Waterhouse, may also be referred to here. If it be supposed that the latent image is converted into a sulphur compound which is not developable, the action would be confined to the unexposed parts of the film, which, sooner or later, always give way under the influence of alkaline developers. Complete reversal would thus be secured.

With reference to the sensitiveness of plates, the explanation at the end of the "prologue" of the influence oxygen exercises in promoting the dissolution of copper in diluted sulphuric acid is apposite. The sensitiser promotes the action of light in a precisely similar manner, it may be supposed; and it is clear that any degree of sensitiveness may be secured, according as the substance associated with the silver haloid, and which acts as depolariser by combining with the halogen thrown off from the haloid under the influence of light, is capable of contributing more or less of the energy necessary to render the interchange one which would occur without any external E.M.F. being brought to bear.

Judged from the point of view here advocated, it would seem that there can be but very little difference between various developers when used under comparable conditions; at most the variation would arise in the rate at which development would take place. It does not appear probable that the character of the deposit would vary greatly in "grain" or colour. But, since in practice considerable differences are noticed, it is probable that not only in the case of pyro and ammonia, but also in others, the deposit does not invariably consist of silver alone.

In concluding this statement, attention may be called to the great opportunity for research of a by no means difficult character which photography affords. We want experiments made in a great variety of directions, but under much simpler conditions than heretofore adopted; the effects of monochromatic lights, and the influence of various pure substances as sensitisers in association with silver haloids, are especially important subjects to study.

Abney has shown that such a substance as a nitrate stops the action of the yellow rays; we want observations on the effect of such substances. Gelatine plates have been of great service to picture-makers, but they are a great bar to scientific progress, as we can never know their exact composition, and we must return to the neutral medium collodion if we wish to gain definite information on matters such as have been referred to. Such experiments, moreover, should have great practical value, as the results may ultimately enable us to largely extend the applications of photography.

HENRY E. ARMSTRONG, F.R.S.

AMERICAN NOTES AND NEWS.

For the Poor Amateur.—Our sprightly young contemporary, the *Pacific Coast Photographer*, says it has received ten dollars from a kind, benevolent lady to be applied on account of six subscriptions to the *P. C. P.* for "poor amateurs!" It says that, if there are any amateur photographers who find themselves unable to subscribe to their journal from lack of means, they will be pleased to send it to them. We compliment our contemporary on its ingenuity in advertising.

Oxalic Acid as a Preservative of Pyro.—Mr. W. E. Partridge, in the *American Amateur Photographer*, enters a plea for this "long-forgotten acid" as a preservative of pyro. It is permanent, and, used in small quantities, keeps the solution as clear and colourless as water. He recommends employing it in the proportion of two per cent. of the water in which the pyro is to be dissolved; for hot-weather work, three per cent.; at the latter strength he speaks well

of it as a preservative of hydroquinone, which, in the solid state, does not, as a rule, keep well.

Keeping Properties of Sulpho-Pyrogallol.—In an address to the Albany Camera Club, Mr. F. C. Beach says that, in 1882, he imported two bottles of the late Mr. Herbert B. Berkeley's sulpho-pyrogallol, one of which he has kept to this day. It is still clear. It is a ten per cent. solution, forty-eight grains of pyro to the ounce. Though standing so long, the colour of the solution has changed very little. It is of a light brown hue, and Mr. Beach believes it will be as vigorous as ever. Mr. Berkeley acidified the neutral sodium sulphite with citric acid, and then added the pyro.

The Camera and Disease.—Dr. M. L. Vander Straker, of Kansas, says that the latest novelty in the way of photography is the employment of the camera at hospitals to register the modifications of disease. Different proofs are taken at various stages of the disease, and the comparison of these with photographs of others similarly afflicted discloses phenomena of great interest and value to medical science. The employment of the camera in this manner on this side of the Atlantic is no novelty, and we are aware of doctors who have photographed their patients both before and after their cure, to show them the beneficial effects of their treatment. If the results are sufficiently striking, what better testimonial or recommendation could a doctor require?

The Californian Camera Club, San Francisco.—Since the organization of the Club a little over two years ago, it has made great strides. The Club is now established in commodious quarters in one of the handsomest buildings in the city, and has come to be recognised as one of the leading photographic societies in America. Its dark rooms are at the disposal of accredited visitors, and the members extend a special invitation to the members of sister societies—American and "foreign." Meetings, first Tuesday of each month; "Club Talks," every Wednesday; "Outings," first and third Sundays from April to November; Monthly Exhibitions, date set by Committee. Outings on Sundays! Oh, fie, good Californian clubbers!

"1992."—Mr. Bogardus amused us the other day when he looked backwards, and told us a few of the funny things which occurred in photography years ago. Now he has reversed the process, and, in the pages of the *St. Louis and Canadian Photographer*, has been putting on the cap of prophecy. In 1992 all photographers are obliged to take out a licence, and may not photograph more than three babies a minute. Cyanide, inserted in a funnel in the throat of the victim, is used for executions, as more economical than electricity. Photographs are all taken in natural colours; ladies complain that their cheeks and lips are not red enough, and red-nosed men say their noses are not as red as the pictures make them. A Convention, to which members proceed on flying machines, is held, 25,000 members being present. After considerable speechifying, it adjourns to April 1, 2042, it being held once in fifty years.

American Silver Printing.—At the last meeting of the London and Provincial Photographic Association Mr. H. Snowden Ward, who had just returned from a brief visit to America, passed some rather severe strictures on the qualities of American professional photographic printing which has caused us very great surprise. If these strictures are justified, the character of the printing turned out by our transatlantic friends must have undergone a change for the worse, as from our experience of it we are by no means disposed to place it, either on technical or artistic grounds, one single point below English silver printing of the highest class. As for the permanency of American albumen prints, the mass of evidence is in favour of its being as great as that produced elsewhere. Of course we here speak of the matter in a general sense, as we presume did the critic we have quoted. It would be an easy thing, no doubt, to select a few American prints below the average of English quality, and *vice versâ*, but it would be rash to generalise from this that American prints were inferior to English, or English to American.

Dr. Jeserich Anticipated.—During 1864, according to a Canadian contemporary, a forgery of ten thousand dollars, represented in two cheques, was discovered in the Assistant Treasury in New York, and came to be a question of the assistant treasurer, who accepted the cheques, or the auditor, whose name was signed to them, standing the loss. The assistant treasurer testified that the signatures of the auditor to the two cheques were genuine, and refused to admit a possibility of forgery, and claimed to be able, through his experience, to tell to an absolute certainty whether a signature he was at all familiar with was genuine or forged. The assistant treasurer at New York was, at that time, a very important personage, coming in importance directly after members of the Cabinet, and the friends of the auditor, who had perfect confidence in his integrity, awakened to the fact that they must find evidence of an unmistakable and fully convincing nature at once in order to clear their man. The means they adopted as a last resort, and which proved successful, was photography. Enlarged photographs of the two forged cheques in question were made, which showed, so conclusively and clearly that none could doubt, the false, traced letters of the names over which the letters in ink had been written. The tracings had then been cleverly erased so as not to be visible to the eye, but were brought out in startling clearness by the camera. The auditor was cleared of all responsibility, and the assistant treasurer, besides standing the loss, was so mortified at the evidence of his cleverness (?) in detecting forgery of a signature that he had seen thousands of times, that he immediately resigned his office.

DEVELOPMENT OF WEAKLY PRINTED POSITIVES ON GLASS AND OPAL.

[*Photographische Correspondenz.*]

Referring to the development of insufficiently printed proofs on celloidin, Obernetter, aristo, Mignon, and similarly prepared papers, as reported in our last number, further experiments have been made by the author with a view to developing glass positives and opals on plates coated with printing-out emulsion.

The experiments were made on "chlor-silber-gelatineplatten zum Auscopiren" by Schattera, of Vienna.

The plates were copied sufficient only to show a faint impression—a mere, but distinct, outline—and then developed by means of an acid hydroquinone, or pyro developer.

As these plates are not in any way liable to fog, and will stand a comparatively energetic treatment, the developer had consequently to be modified.

For red and violet tones the following hydroquinone developers are strongly recommended:—

	I.	II.	III.
Water	1000 parts ..	1000 parts ..	1000 parts.
Hydroquinone ..	15 „ ..	15 „ ..	15 „
Sulphite of soda..	50 „ ..	50 „ ..	50 „
Citric acid	3 „ ..	— ..	—
Acetic acid.....	— ..	5 „ ..	—
Tartaric acid	— ..	— ..	5 „

These developers result in clear, colourless solutions, which will keep in good condition for a long time. They are best used at a temperature of 68° to 77° Fahr. If the temperature is too low, development will take place but slowly. The plates are exposed in diffused daylight not longer than from five to fifteen minutes. During development the tray has to be kept rocking. The combined toning and fixing bath is that recommended in my last contribution, but diluted with equal parts of water.

For the production of yellowish-red tones, which are very effective with glass positives, the developed and washed picture is fixed in a neutral twelve per cent. solution of hypo, and is then transferred to the combined toning and fixing bath until it assumes a slightly reddish tone, when it is at once withdrawn and washed for some hours in running water.

Sepia brown tones are obtained with—

Water	1000 parts.
Hypo	100 „
Acetate of ammonium	100 „
One per cent. solution of chloride of gold ..	30 „

By another method red tones are produced by fixing the developed plate in a neutral fixing solution and transferring the same to the toning bath recommended by Eder and Pizzighelli,* to which for each 1000 parts of solution half a part of phosphate of soda has been added. The picture will quickly take a peculiar yellow red tone, which, on drying, changes to a beautiful, brilliant red.

Violet, purple-violet, and blue-black tones are obtained by longer or shorter immersion in the combined toning and fixing baths.

The hydroquinone developer No. I. can be used for several plates in succession, and such already used solutions act at once as developer and intensifier, owing to the considerable quantity of silver salts which they dissolve out of the coating of the plates. After standing for some time, the silver will be reduced to the metallic state, and the solution will turn muddy; warmed on the water or sand-bath, the sediment will, however, soon settle, and, after filtering, the developer may be used afresh.

Developers Nos. II. and III. work somewhat differently and develop quicker, giving at the same time purplish-violet tones, which in the neutral fixing bath are, however, lost. If these developed and well-washed plates are fixed in a weak solution of hypo and ammonia, or a mixture of ammonium and carbonate of ammonium (ten per cent. solution), they will, after washing and drying, show a splendid ruby colour, which cannot be obtained by developer No. I.

The fixed positives have in all cases to be well washed in running water, or they will, after some time, show yellow whites.

Developers with pyrogallic acid work still quicker, and by their means dark violet and black tones are easier to obtain. The developer best suiting these plates consists of

Pyrogallic acid	20 parts.
Water	1000 ,,
Citric acid	16 ,,
Sulphite of soda	50 ,,

It will develop vigorously and rich, giving the positives a brown colour, which afterwards, in the combined toning and fixing bath, changes to a violet bluish-black, and black tone. It is also best suited to plates showing, to commence with, a very faint impression only, as by its employment all harshness is avoided.

To the practical photographer this process offers many advantages; it makes him practically independent as regards duration of exposure. Under or over-exposure will no longer trouble him; from ten to fifteen minutes' exposure to diffused daylight will in all cases be sufficient to obtain an impression, which can be easily and reliably developed into a good picture.

A further and very definite advantage consists in the absolute absence of grain, which will make this method especially adapted to the production of enlarged glass positives, the colour of which can be had at will from a red to a violet and black tone.

It is equally well suited to the production of lantern slides by contact printing; and last, but not least, all operations may be carried out in gas, lamp, or subdued daylight. E. Valenta.

LANTERN SLIDES—HOW TO PRODUCE AND EXHIBIT THEM.

[Amateur Photographic Society of Madras.]

There can be no doubt that at the present day the use of the optical (*alias* "Magic") lantern is in universal request for purposes of instruction as well as amusement, and there also can be no doubt that an exhibition of lantern slides, even of moderate quality, affords a great deal of pleasure to the spectators, whether youthful or grown-up. An amateur photographer cannot, therefore, put his collection of negatives to better use than in preparing therefrom a set of lantern slides of the best quality his knowledge and experience will permit; he will find that his views, which, perhaps (especially if they be of small size), gain scant notice in the form of paper prints, will, when enlarged on a screen, receive the greatest possible attention from as many people as can be gathered together.

There are two very easy and cheap ways of making the slides—the old wet-plate process, and the recently introduced gelatine "lantern" plates.

To any one who ever worked the old wet process I should say stick to it, for with it you can get results as good as by any other process under the sun, and it is undoubtedly infinitely cheaper than any other mode; also it can be worked in the hottest weather.

Slides by the "collodio-bromide" process are also very beautiful, and

* A.	Water	1000 parts.
	Sulpho-cyanide of ammonium	40 ,,
	Hypo	3 ,,
B.	Water	1000 parts.
	Two per cent. solution of chloride of gold	60 ,,

quite equal to any others, but the ordinary amateur would find it very difficult to make a satisfactory emulsion, and about equally difficult to clean and coat the plates properly.

I should recommend the ordinary amateur, whose experience is solely in exposing ready-made plates, to keep to the "lantern" plates, which can be bought, of perfect quality, at one shilling per dozen. It will greatly conduce to the production of first-class results, if the developer be also bought ready made from the manufacturers of the plates.

I will first describe my apparatus, which is set apart entirely for the production of lantern slides and stereoscopic transparencies: A small camera made roughly of teak wood—it consists of a back and a front joined by a bellows made of a piece of brown paper glued between two pieces of black cloth (silesia); the baseboard is a plain piece of teak with a quarter-of-an-inch slot cut along the centre, through which a small screw passes to fix the back at the proper focus; the front is, of course, screwed to the baseboard, and has a rising and falling piece of wood on which the lens is fixed. The baseboard has a guide piece screwed on each side, between which the back slides, and is thereby kept parallel with the front. The lens should be a short focus rapid symmetrical.

A dealwood box, with four sides and a front, but no back: the front is provided with grooves in which the negative fits and has a series of smaller frames to hold negatives smaller than the largest size; in my case the largest size is $6\frac{1}{2} \times 4\frac{3}{4}$, and I have frames for 5×4, $4\frac{1}{4} \times 3\frac{1}{4}$, and $3\frac{1}{4} \times 3\frac{1}{4}$ negatives.

A sheet of plate glass, 15×12, ground on one side to diffuse the light when it is not possible to point the apparatus to the clear sky.

A piece of cardboard, which rests on top of camera and negative frame, and is, I find, quite sufficient to keep off outside light, and it has an additional recommendation in that it is very easy to get at the lens to remove or replace the cap or stop.

A flat board, about thirty inches long and six wide by one thick: it has a slot $\frac{3}{8}$ inch wide up the centre along which the screws travel, fastening the camera and negative frame at their proper distances apart. It stands upon four solid legs, the smaller pair being about six inches high, and the larger of sufficient height to raise the board to an angle of 30° to 45°.

A plain dealwood table, the top being such a height from the ground as will enable you to sit comfortably on a chair to do your focussing; the table should be big enough to accommodate, not only the apparatus, but also a box of negatives, focussing glass, and sundry other things.

The camera and the negative frame are fastened to the board by screws about $3\frac{1}{2}$ inches long with wing-nuts.

The camera takes quarter-plates, but to use it for plates $3\frac{1}{4}$ inches square, all that is necessary is to fasten a piece of wood at each end of the interior $\frac{1}{2}$ an inch wide—this leaves a space in the centre $3\frac{1}{4}$ inches square. The plates rest on four silver pins, which is a necessity in case of using wet plates, and for the same purpose the lower part should be thickly coated with Japan to prevent warping from the drips from the plates.

The whole apparatus (stand, table, camera, dark slide and negative holder) was all made by an ordinary carpenter from my rough sketches, the total cost of everything was under Rs. 20. The bellows I made myself.

Of course, any ordinary camera, quarter or half-plate, may be used in place of a special one, and the ordinary dark slides can very easily be adapted for the gelatine lantern plates; for wet plates it would be very advisable to have a single slide made specially, as ordinary double dark slides would not be improved by the use of wet plates therein.

The table, with the apparatus, can be placed in a verandah or close to a window in a room with the higher end of the board pointing to the sky.

Placing the negative in the holder with the gelatine side facing inwards to the lens, focus the picture by pushing the camera bodily up and down the board, clamp it and finish the fine focussing by the sliding back of the camera, and finally with the lens if it be provided with rack and pinion. The use of a magnifying focussing glass is very essential, as the finest possible adjustment should be made for lantern slides.

On the ground-glass side of the focussing screen you should rule lines of various sizes and shapes to suit the masks you propose to use; it used to be the custom to have every slide (no matter what the subject might be) of one shape and size to suit the dissolving view business, but it has of late years been realised that the aperture in the mask should be adapted to the picture, and not that the view should be frequently spoilt by cutting it to one particular shape.

When satisfied with the adjustment of focus and the shape and size of the picture on the screen, get the dark slide with the prepared plate wet or dry, remove the screen, insert the slide, and expose the plate in

the usual manner for the required time, shut up the slide, and take it to the dark room for development, &c.

I think it will be sufficient for one evening if I give details for two processes. 1st. The old wet-plate process. 2nd. The recently introduced gelatine "lantern" plates.

Wet-plate Process.—The apparatus required and the chemicals used in this process are as follows:—Glass bath, in a wooden case, with glass dipper; collodion pourer, to contain about four ounces; clean glass plates, 3½ × 3½—they should be thin and white. Iodised collodion, nitrate of silver, ferrous sulphate, potassium cyanide, glacial acetic acid, alcoholic tincture of iodine.

Collodion.—Mawson's or Thomas's ordinary collodion, iodised as long as possible before it is required for use; it should be a deep reddish-orange colour.

Silver Bath.

Nitrate of silver	250 grains.
Nitric acid	1 or 2 drops.
Distilled water	10 ounces.

Developer.

Ferrous sulphate (green crystals)	200 grains.
Glacial acetic acid	4 drachms.
Distilled water	10 ounces.

Fixing Bath.

Cyanide of potassium	240 grains.
Water	20 ounces.
Tincture of iodine	2 or 3 drops.

To clean the plate, rub it well on both sides with a little whiting in water, or with tripoli powder in methylated spirit with a little ammonia; then rinse it in hot water, and dry it with a clean cloth free from fluff. The plates should be as nearly chemically clean as possible to ensure freedom from streaks and stains; you may be sure of one thing—you cannot make them too clean!

Silver Bath.—Dissolve the silver in the water, put it in the sun for a day, add the acid, shake well up, and filter into the glass bath. The solution should be perfectly bright and clear; if not, it should be re-filtered.

Developer.—Mix the acid and water together, dissolve the iron in the mixture; filter if necessary, and keep well corked.

To coat a plate: Take a clean one in your left hand by as little of one corner as possible, pour on to the centre a pool of collodion, enough to cover half the plate (first dusting the plate with a broad camel-hair brush); let it run first to the right far corner, then to the left far corner, then as near as possible to your thumb without touching it, and pour off the surplus by the remaining corner. Do all this quietly and deliberately, without too much delay; then raise the plate vertically and rock it, so that no streaks may form in the film. Drain the plate well, but do not let it get dry anywhere; place it on the dipper, face outwards, and lower it into the bath with one continuous quick movement; move the dipper slightly to and fro for a few seconds, and then let it rest for a minute or two.

Raise the dipper gently for a moment, and at first you will observe that the bath solution runs down the face of the plate in streaks; but very soon you will see that it runs smoothly all over the surface, which has now changed to a creamy state from the formation of iodide of silver in the collodion film.

Drain the plate as closely as possible, blotting off the last drop or two, and cleaning the back with a piece of blotting-paper; place the plate face downwards in the dark slide, which should be kept vertical to prevent the bath solution running back in streaks over the face of the plate.

Expose the plate in the camera for the proper time, and return without delay to the dark room for development. It is most difficult to say what is the proper exposure, as it depends upon so many different things; but I may say that reducing a half-plate negative to 3 × 2½ inches, using a lens with aperture *f*-16, negative clean and not over-dense (such an one as will give a brilliant silver print in the shade), pointing to clear sky without the ground plate-glass, the exposure would be about forty seconds. The ground glass increases the exposure about forty per cent.—a thin negative would want, perhaps, fifteen to twenty seconds, while a dense one may require three or four minutes. Nothing but practice will teach exactitude, and the most experienced will sometimes be considerably out in his calculations.

To develop a wet plate, take a small quantity of the iron solution in a cup or measure—two drachms are ample for a lantern plate—and flood the plate with one even sweep. Care must be taken not to let the solution strike the face of the plate too hard, and not to let more of the solution than you can help run over the sides of the plate.

To any one accustomed only to gelatine plates it will appear very surprising to see the very short space of time required to develop a wet plate. The whole operation is over before a gelatine plate would show any signs. When sufficient density has been obtained, rinse the plate under a tap or from a jug of water, and drop it face upwards into the fixing solution.

The fixing bath, being a most deadly poison, had better be kept outside the dark room, the fumes being most unpleasant and headachy. This operation also takes a very few seconds, and after an amount of washing that would be wholly insufficient for a gelatine plate, the plate may be toned or put away to dry at once. The toning bath may be either—

Chloride gold	1 grain.
Water	10 ounces.

Or,

Platinum tetra-chloride	1 grain.
Nitric acid	1 drop.
Water	8 ounces.

The first gives purple tones, and the other one black tones; when toned sufficiently, wash for a while and dry. The platinum stock solution should be neutralised with soda carbonate before adding the water and nitric acid.

When quite dry, the high lights should be perfectly clear glass. With some collodions, however, there is a faint veil over the high lights, which may be removed by varnishing. A "crystal" varnish of dammar, dissolved in benzol, or the ordinary negative varnish, diluted with about one-third of alcohol, will be found suitable, and all varnishes should be carefully filtered before use. In my opinion, all collodion slides, and, indeed, all slides by any process, should be varnished.

Gelatine Lantern Plates.—These may be used either for contact-printing or for reducing or enlarging in the camera. Nearly all my experience has been with Thomas's plates, and I have never had cause to regret having kept to that one brand. I have used some sixty or eighty dozen, but have had to reject none on account of faults in the plate, although I have had to reject a good many for my own mistakes and carelessness.

It is possible with these plates and the developers recommended by the makers to obtain almost any tone from black to red. I prefer keeping to black tones, for there are several advantages to be gained thereby, not the least being that the time of exposure and time taken up in developing are at their shortest. The results are more certain, and in my experience the delicate tones of purple and brown observable by transmitted light are quite lost when shown on the screen with oil-light. Perhaps the oxyhydrogen or electric light may allow these delicate tones to be observed on the screen, but these are practically unobtainable in India.

The makers themselves give the time of exposure and development as ranging from two minutes twenty-five seconds for black tones to thirty-six minutes for red tones (for reduction in camera), so the gain in time is very real.

I shall here content myself by giving details for black tones alone; any one wishing to get warmer colours can get the fullest particulars from the descriptive memorandum issued with the plates.

Reduction in camera from half-plate as before, lens with *f*-22 stop, negative pointing to clear sky *with* sheet of ground-glass one and a half inch distant from negative, which if a clean one, not too dense, will take about forty-five to sixty seconds, the developer being—

1.

Sodium hydrate (caustic soda)	160 grains.
Distilled water	20 ounces.

2.

Hydroquinone	160 grains.
Sodium sulphite	2 ounces.
Citric acid	60 grains.
Potassium bromide	40 ,,
Water (distilled)	20 ounces.

For use, take a quarter of an ounce of each, and add half an ounce of distilled water, making one ounce in all.

Develop until slightly more dense than you wish the finished slide to be, as they lose a little in the fixing bath, which is made thus:—

Hyposulphite of soda	5 ounces.
Sodium sulphite	1 ounce.
Sulphuric acid	1 drachm.
Water	to 20 ounces.

Dissolve the hypo in fifteen ounces of the water and the sulphite of soda in the remaining five ounces; add the sulphuric acid to the latter, and then pour the acid sulphite solution into the hypo, and well mix; keep well

corked, and it will last for a very long time, but personally I always used a new fixing bath for each batch of slides.

If you find the slide, after fixation, to be rather too dense, you can reduce it very easily by applying a weak solution of hypo with a few drops of solution of ferridcyanide of potassium (Farmer's reducer).

After fixing, wash well (face downwards, if possible) for an hour or two, and dry in a place free from dust.

Contact-printing by artificial light may be done in the evening. The exposure for a clean negative as before, two feet from a Silber burner No. 1, wick clean, cut quite level and turned up just short of smoking globe perfectly clean, kerosine oil 150° water-white, would be about thirty seconds. The developing, &c., is exactly as for camera reductions.

These bromide transparencies can be toned by the uranium nitrate and ferridcyanide of potassium toning solution recommended by the Eastman Company for their bromide paper. The solution is made up of—

Uranium nitrate	9 grains.
Potassium ferridcyanide	8 „
Glacial acetic acid	5 drachms.
Water	16 ounces.

Tones, from black, through browns to red, are very easily obtained with this solution, and when the desired tone is obtained the transparency should be washed *only until* the slight yellow stain in the high lights has been removed; any longer washing only results in the removal of the colour previously obtained.

When your slide is finished and finally dried, see if any spotting or retouching be required, and, if so, attend to it carefully; then varnish it as before described for wet-plate slides. Gelatine plates are much more likely to get spots and blemishes from dust and other causes than the old wet plates, and extra caution is, therefore, very advisable. With wet plates, when the washing is finished, a dip in hot water will dry the slide in a very few minutes; but such a procedure is not possible with gelatine plates.

To mount the slide, get a thin glass 3¼ inches square, as white as possible and quite clean, fit a suitable mask between the two glasses, and bind the whole together at the edges with strips of gummed paper. To distinguish your slides from those of any one else, you should bind the tops and bottoms with strips of paper of a different colour to what you use for the sides. I generally use *orange* paper for tops and bottoms, and *black* paper for the sides. Of course, this can only be done by cutting all the strips into pieces 3¼ inches long; but I do this in every case, even when using the same coloured paper for all four sides.

The title of the picture can be written on the mask, in white ink if the mask be black, or in black ink if the mask be white; a label outside is equally useful, but is liable to get dirty. The slide may be considered to be ready to show when you have gummed two white circular spots of paper on the two top corners, and have cleaned the outsides of the two glasses. On one of the circular spots you can put its consecutive number, and on the other your own initials, date, &c. When inserting the slide in the optical lantern frame, these two spots should be at the bottom next to the condenser.

With an oil lantern, the main points are to see that the outside of the lamp is quite clean and dry, that the glasses of the condenser and front lens are in their proper places and quite clean, that the best oil procurable be used, and that the wicks are clean and cut quite level. After all the wicks are lighted, they should be turned down quite low and raised little by little every few minutes until at their full height just short of smoking; ten minutes over this operation are not too much to spend. Hughes' "Pamphengos" is the best oil lantern I have ever seen anywhere, and can be obtained in several qualities from two to six guineas.

FRED. DUNSTERVILLE.

CLAIM £10, BALANCE FOR PHOTOGRAPHIC STUDIO AND CONTENTS.

WHITTAKER *versus* MCDONALD.

MR. C. N. WILSON, barrister, appeared for the plaintiff, and Mr. White for the defendant.

Mr. Wilson stated his case as follows:—In this case the plaintiff sues for a balance of 10*l.* for a studio and its contents, situated at Kirkby Stephen, and sold by the plaintiff to the defendant on September 12 last year. It appears Mr. Whittaker is a photographer, and carries on business in this town. He had also a branch studio at Appleby and one at Kirkby Stephen. The defendant, McDonald, who for a good many years had been an assistant to Mr. Whittaker in Penrith, had also helped him with the business at Appleby and Kirkby Stephen. Mr. Whittaker, not wanting him in opposition at Penrith, undertook to sell the studios at Appleby and at Kirkby Stephen for the purpose of enabling him to carry on the business of a photographer at those places, but distinctly on the understanding that he was not to carry on a business in opposition at Penrith, and the prices arranged were 20*l.* for each of the studios. Ten pounds was paid down on account, and the balance was demanded. There was a balance of 30*l.* left over. Matters all went on very well for a short time, but then the defendant, McDonald, in direct opposition to what he had agreed to, went and sold the studio at Kirkby Stephen, and it is for the balance due on that studio that we are now suing. I call the plaintiff, Mr. Whittaker.

Mr. Charles J. Whittaker (examined by Mr. Wilson). Are you a photographer carrying on business in this town?

Mr. Whittaker. Yes, I am.

Q. Now, you have been in business since 1887?

A. In February, yes.

Q. Previously you were in business at Appleby?

A. Yes, in May 1885.

Q. Before that you were in partnership with Mr. Abel McDonald, Mr. Edward McDonald's brother?

A. Yes.

Q. And you dissolved partnership in 1888?

A. Yes.

Q. Now, had you the branch business at Appleby?

A. Yes, in Leslie's Yard, Appleby.

Q. I think the defendant, McDonald, came as an assistant to you?

A. In December 1887.

Q. How long did he act for you?

A. Six months.

Q. And you sold him the Appleby business?

A. Yes, for 13*l.*

Q. I think he carried on the business for some time?

A. Yes.

Q. And you purchased the business back again?

A. Yes, I did so.

Q. Did not he come to you again in 1888 as an assistant?

A. Yes.

Q. And he worked regularly for you until when?

A. Until September 1891.

Q. What were his wages?

A. When he first came to me he had 15*s.* a week, then 20*s.*, then 25*s.*, then 30*s.*, and the last twelve months 35*s.*

Q. I think he gave you notice in September last year?

A. Yes.

Q. Had you any conversation with the defendant, Mr. McDonald, about the purchase of these places at Appleby and Kirkby Stephen?

A. He proposed that I should sell him the places.

Q. And you did not consent?

A. I did not consent at first.

Q. But finally you did?

A. Yes.

Q. What did you sell him these studios for?

A. The actual terms were 40*l.*

Q. 40*l.* each?

A. 20*l.* each.

Q. What were the terms about carrying on the business?

A. I pointed out to him that I would not like him to start in opposition to me in Penrith, and, if he would only be content with carrying on the business at Appleby and Kirkby Stephen by himself, I would let him have them on certain conditions.

Q. What did he pay you down?

A. He paid me 10*l.* at Martinmas, but not in full.

Q. Was there a balance of 30*l.* owing to you?

A. Yes.

Q. Now, I think he is still carrying on the business at Appleby, and is still in possession of that studio?

A. I believe so.

Q. What about the Kirkby Stephen studio?

A. He has sold it.

Q. Whose name is over the door?

A. Mr. Yeoman. I saw it at Kirkby Stephen, and it was Mr. Yeoman.

Q. What was the arrangement?

A. He was to carry on the business on his own account.

Cross-examined by Mr. White.

Q. Was the agreement with Mr. McDonald in writing?

A. Yes.

Q. Where is the writing?

A. McDonald has it.

Q. You have had a copy of this agreement?

A. No, I have not.

His Honour. I cannot allow any more evidence to be given about it.

Q. Do you produce the document?

Mr. White. He has had a *subpœna* to produce the document.

His Honour. If you have anything else to ask, apart from the agreement, you had better do so.

The agreement was then put in by Mr. White.

His Honour. I do not know what the studio or its contents may consist of.

Mr. Wilson. I object to that agreement; it should have a 5*s.* stamp.

His Honour. If it is not properly carried out, the plaintiff is entitled to have the contents of the studio back again.

Mr. Wilson. We rely upon part payment of this 40*l.*

His Honour. If it is a written document, you must rely upon it. I cannot receive evidence without it. If there is no stamp, I cannot receive it. That writing is not before me, and therefore I cannot receive any evidence upon it. That is your copy?

Mr. White. That is my copy.

His Honour. I will tell you my view of the subject. There is not the slightest doubt about it that, if there is any agreement, it must be produced. Therefore all the evidence that has been received I must strike out. All this evidence that he sold these things at Kirkby Stephen and Appleby for 20*l.* a piece must be struck out. As the case stands at present, I have no evidence at all. I must have the original of this document.

Mr. Wilson. Have you got the original?

Witness. I have a duplicate.

Mr. Wilson. Will you produce it? [Witness produced the document.]

Mr. Shepherd. This gentleman (Mr. White) is my clerk and with your Honour's permission I will address you. The agreement is in writing, and before it is produced I think there is no case.

His Honour. The burden of proof is on the plaintiff.

Mr. Wilson. We rely upon the fact that there have been goods sold above the value of 10*l.* and there has been part payment. We rely entirely upon the evidence.

His Honour. It was an agreement in writing.

Witness here handed in duplicate of document.

Mr. Wilson. We do not put this in, your Honour.

His Honour. If you do not put this in, there is an end to the case.

Mr. Shepherd. Then I apply for the verdict with costs.

His Honour. If you do not put that in, my verdict is for the defendant in the usual way.

Verdict for the defendant accordingly.

Our Editorial Table.

Workshop Receipts (Fifth Series).

E. & F. N. Spon, 125, Strand, W.C.

In this, the most recent of Messrs. Spon's useful series of *Workshop Receipts*, the subjects embrace, *inter alia*, laboratory apparatus, cements, copying, distilling, filtering, lacquers, magic lanterns, waterproofing, boatbuilding, and barometers. So far as we can perceive, the articles are entirely made up of selections judiciously made from writings on the various topics treated; this, however, forms no objection to their utility, while the source is freely acknowledged.

Watson & Sons' New Catalogue.

A most compendious and useful catalogue, which contains everything necessary for the photographer, whether amateur or professional. In this the "Acme" camera of the firm finds premier position, which is well justified by its merits. We observe that, since our former notice of this camera, aluminium has been utilised in its metallic fittings, by which a considerable reduction in its weight is secured. Other cameras, for studio and field, are described, and of hand cameras there are not a few. Lenses made by this and other firms are fully tabulated, together with stands, dark and projecting lanterns, backgrounds, enlarging appliances, and chemicals. The catalogue, of ninety pages, is a highly suggestive one, and will be perused with advantage.

A Guide to Electric Lighting.

By S. Bottone. London: Whittaker & Co.

Mr. Bottone has for many years been recognised as a lucid writer on all topics connected with electricity, and in this work of 194 pages he treats the subject of electric lighting in a popular manner, capable of being readily comprehended by the general public. He gives accounts of the various batteries employed in the generating of electricity for lighting, coupled with discriminating observations on the special capabilities of each, together with drawings and descriptions of the lamps in general use, whether incandescent or arc. The work is most copiously illustrated.

The *Idler* for May, we are happy to say, shows a distinct advance both in the quality of its letterpress and illustrations upon previous numbers. We are pleased to learn that our old contributor, Mr. Conan Doyle, is to supply fiction to an early issue.

"Illustrations" for April, edited by Mr. Francis George Heath, contains numerous illustrated stories and articles of a sufficiently diversified character to be interesting to the general reader. There are also portraits and biographies of such notable individuals as Sir Charles Dilke and Mr. Holman Hunt.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 6980.—"An Improvement in Photographic Printing Frames." A. T. Newington.—*Dated April* 12, 1892.

No. 7335.—"Improvements in Dishes or Trays for Photographic Purposes." C. T. Maling.—*Dated April* 16, 1892.

No. 7336.—"Improvements in and connected with Photographic Shutters." F. O. Bynoe.—*Dated April* 16, 1892.

No. 7414.—"Improved Means and Ingredients for Colouring and Tinting Photographic Silver Prints." E. Hooker.—*Dated April* 19, 1892.

No. 7471.—"An Improved Dark Slide for Photographic Camera." A. B. Johnston.—*Dated April* 20, 1892.

No. 7501.—"Improvements in or Relating to Photographic Films or the like." Communicated by G. Eastman. A. J. Boult.—*Dated April* 20, 1892.

No. 7507.—"Improvements in the Manufacture of Transparent Materials and the Application of the same to Photographic or other Purposes." T. Christy.—*Dated April* 21, 1892.

SPECIFICATIONS PUBLISHED.

1891.

No. 5213.—"Photographic Cameras." Spooner.
No. 8934.—"Photographic Cameras." Conybeare.
No. 9042.—"Photographic Cameras." Micklewood.

PATENTS COMPLETED.

Improvements in Photographic Cameras.

No. 5213. George Percival Spooner, Bron-y-garth, Portmadoc, North Wales.—*March* 24, 1892.

The object of my invention is to effect improvements in the construction of photographic cameras.

I construct my improved apparatus in two compartments, preferably one above the other. The upper compartment contains the lens, bellows, focussing screen of ground glass, swing-back, shutter, and other fittings; and the lower compartment contains the plates, previous to, and after, exposure.

The plates are held in sheaths, and the sheaths are placed in a drawer fitted with grooves on each side (hereinafter called the "plate drawer"). The sides of the plate drawer, between the grooves, are slotted to permit the plate lifter to pass up and down.

The plate drawer is placed in a case (hereinafter called the "plate box"), so as to be capable of sliding in and out of the same, as in the case of an ordinary drawer.

The plate drawer is closed and locked so as to exclude the light, or it may be opened in a dark room, or within the camera, by suitable methods.

The plates are raised from the plate drawer by lifting bars, consisting of a pair of curved levers, with suitable appliances attached thereto. The lifting bars have toothed racks, and engage toothed quadrants on each side of the camera. The quadrants are fast on an axle, and are actuated by a suitable crank or lever outside the case, which crank or lever is fixed to a cam wheel hereinafter described. The sheath is lifted by turning the crank until the sheath is in the position previously occupied by the focussing screen in the camera compartment.

Previously to the passage of the sheath from the plate drawer to the upper compartment, the lense shutter and dark door are closed; a slide between the plate-box case and the upper compartment is opened, and the focussing screen is moved back to admit of the sheath taking its place. The sheath then passes into the upper compartment, and the slide is closed, the slide sustaining the sheath. The plate is then in position for exposure, and, after exposure, it can be returned to the plate drawer by a reversed movement of the crank.

When the sheath has been returned to the plate drawer, the focussing screen takes the place of the sheath, and the plate drawer is moved on ready for the next operation.

The several shutters and other doors are actuated by a cam wheel, with separate cam grooves for the several motions.

The focussing screen is held in position preferably by four bell-crank levers, two on each side.

An opening is formed in the back of the upper compartment, so as to enable the picture to be properly focussed on the screen. This opening is closed by a shutter or door during exposure.

The camera is also fitted with screws, nuts, clips, and other means for adjusting, fixing, and arranging the several parts of the apparatus.

The cam or cams may be driven by a connecting rod attached to a coiled spring, previously wound up, a rack being formed on the connecting rod, driving a pinion on the cam. An escapement lever, with suitable attachments, is used to cause half a revolution or thereabouts of the coil spring to lift the plate, and the other half revolution to lower it.

Improvements in and in Connexion with Photographic Cameras.

No. 9042. Edmund Hawthorn Micklewood, 5, St. Michael's-terrace, Plymouth, Devonshire.—*March* 26, 1892.

This invention relates to a means of exposing sensitive plates or films in a camera so as to give a due ratio or balance of exposure to all parts of the

picture. In a landscape, for instance, the sky, distance, and foreground each receive a varying time of exposure by which the best effect is produced.

To obtain this result, I construct in front of the camera a dark chamber, and in the front of the dark chamber provide a rectangular opening proportional to the size of plate the camera is adapted to take. In this opening is a rising and falling shutter, actuated and controlled by suitable mechanism.

It is desirable that the distance of the shutter from the lens should be proportional to the focal length of same.

I should explain that what I mean by a rising and falling shutter is any shutter which is lifted upwards until the aperture is completely open, and, after the proper time for exposure has elapsed, is then lowered; and my reason for this arrangement is that by this means, when used at a distance from the lens in a dark chamber, I am able to allow the sky in a landscape scene, for example, less exposure than other parts of the picture. It may be ascertained by experiment that, if a shutter works immediately over or in front of a lens in the ordinary manner, that the picture on the sensitised plate is not obscured in proportion to the movement of the shutter, and that with shutters, as usually applied to the lens, supposing the moving part to have passed through a small portion only of its travel, even then the whole picture is visible on the focussing screen, whereas I have found that, by interposing the dark chamber between the lens and shutter, the commencement of the raising of the shutter causes the sensitised plate to be exposed only partially, and to become more and more exposed in accordance with the opening of the shutter, the sensitised plate becoming in like manner gradually obscured as the shutter closes, whereby I am able to give the sky, distance, and foreground each a varying time of exposure. It will now be understood that by the term "rising and falling shutter" I do not limit myself to any particular form or construction of same, but I may employ any form or construction of shutter which will produce or act with the herein-stated effect.

It is a well-known principle in optics that the rays passing through the centre of a lens form by far the most perfect image when focussed and thrown on any surface to receive them, hence the use of diaphragms to cut off the outside "pencils" and use only or principally those passing centrally.

From this as a starting-point, and as the result of observation and experiment, I have discovered that shutters acting in close juxtaposition to the lens act as inferior-shaped diaphragms, causing the worst part of the lens—viz., the edges—to do the work during a large proportion of their action, as when a lens is only partially uncovered from the edge the image is being formed and transmitted by the marginal portion only.

Diaphragm shutters working centrally are free from this defect, but as they expose the plate evenly they fail to give a due balance of exposure as required for the best results to the several parts of the landscape.

Again, the image transmitted by a lens is at all times a circular one, of which in photographic cameras a rectangular portion taken centrally only is used, and with cameras as usually constructed the remainder is thrown on the top, sides, and bottom of the camera, so introducing light into the camera not used in the formation of the image, and which, with the exceedingly sensitive plates now used, degrades the image.

In the new combination of dark chamber and shutter in front of the lens now introduced all these defects are obviated, as the former frames the view in front of the lens, and so only allows light actually falling on the sensitive plate to pass into the camera, and the shutter, being applied to the front of this chamber, at a distance from the lens, in no way interferes with the full and efficient action of the latter.

A suitable proportion for the rectangular opening provided in front of the dark chamber, and in which the shutter works, I have found to be half the linear dimensions of the plate the camera is adapted for; the rectangular opening is adjusted to, or situated at, such a distance in front of the lens that only the view actually falling on the plate is transmitted, and all side-light is cut off; thus, with long-focus lenses, it will be evident that the shutter aperture should be placed further away, and with shorter-focus lenses, brought closer.

The shutter being placed at a distance from the lens, the latter photographs the movements of the shutter; hence, as the said shutter moves up and down, the sensitive plate is exposed as if by a rolling curtain which starts from the foreground and returns to the same, the result being that the most delicate cloud effects existing are secured, together with a fully exposed landscape, in a manner far superior to that hitherto obtained.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that I am aware that it has been heretofore proposed to employ a shade outside the lens of a camera to cut off extraneous light, and I am also aware that a dark chamber has been proposed to be employed in front of a photographic lens. Photographic shutters which have a lifting or rising and falling motion are not in themselves new, I therefore lay no claim to these parts taken alone or separately, but what I do claim is:—1. In photographic cameras, the combination with a lens and a rising and falling shutter of a dark chamber, arranged between the lens and the shutter, whereby sensitive plates or films are exposed so as to give a due ratio or balance of exposure to all parts of the plate or film, and to exclude all extraneous light, all substantially as herein set forth. 2. The general arrangement and construction of photographic cameras substantially as shown on the accompanying drawings, the prominent feature being the combination of a dark chamber arranged between the lens and a rising and falling shutter as set forth.

AN APPLIANCE FOR ATTACHING TUBES OR CYLINDERS TO FLAT SURFACES, PRIMARILY APPLICABLE FOR ATTACHING PHOTOGRAPHIC LENS TUBES TO CAMERAS.

No. 8934. HENRY GRANT MADAN CONYBEARE, The Hut, Ingatestone, Essex. —*March* 26, 1892.

AN appliance in accordance with my invention is represented by the drawings annexed.

I employ a flange, to be attached to the camera front by screws. Into this flange I screw a ring having a milled edge. On the inside of this ring are fixed two or more studs. To the photographic lens or other tube is attached a flat ring or flange, having two or more notches cut in the edge, and corresponding with the studs fixed to the ring. On the surface of the flat ring, near one or all of the notches, I fix a small stud or studs.

In lieu of the above I make recesses in the screwed ring, and projecting pieces to the flat ring or flange attached to the lens tube.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
May 2	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 2	Halifax Camera Club	
,, 2	Peterborough	Museum, Minster Precincts.
,, 2	South London	Hanover Hall, Hanover-park, S.E.
,, 2	Stereoscopic Club	Brooklands Hotel, Brooklands.
,, 3	Exeter	College Hall, South-street, Exeter.
,, 3	Glossop Dale	Rooms, Howard-chambers, Glossop.
,, 3	Herefordshire	Mansion House, Hereford.
,, 3	Lewes	Fitzroy Library, High-st., Lewes.
,, 3	North London	Wellington Hall, Islington, N.
,, 3	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 3	Rotherham	
,, 3	Sheffield Photo. Society	Masonic Hall, Surrey-street.
,, 3	York	Victoria Hall, York.
,, 4	Edinburgh Photo. Society	Professional Hall, 20, George-street.
,, 4	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 4	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 4	Putney	High-street, Putney.
,, 4	Southsea	
,, 4	Wallasey	Egremont Institute, Egremont.
,, 4	West Surrey	St. Mark's Schools, Battersea-rise.
,, 5	Bolton Photo. Society	Baths, Bridgman-street.
,, 5	Brixton and Clapham	Gresham Hall, Brixton.
,, 5	Camera Club	Charing-cross-road, W.C.
,, 5	Dundee and East of Scotland	Lamb's Hotel, Dundee.
,, 5	Leeds Photo. Society	Mechanics' Institute, Leeds.
,, 5	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 5	Oldham	The Lyceum, Union-st., Oldham.
,, 5	Tunbridge Wells	Mechanics' Inst., Tunbridge Wells.
,, 6	Bristol and West of England	Rooms, 28, Berkeley-sq, Bristol.
,, 6	Cardiff	
,, 6	Croydon Microscopical	Public Hall, George-street, Croydon
,, 6	Holborn	
,, 6	Leamington	Trinity Church Room, Morton-st.
,, 6	Maidstone	"The Palace," Maidstone.
,, 6	Richmond	Greyhound Hotel, Richmond.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

APRIL 26.—Technical Meeting.—Mr. W. England in the chair.

Mr. ALEXANDER MACKIE said he was continually making collodion emulsion, and occasionally got variations which he could not account for. He showed samples of emulsion which, on drying, changed in colour to bright blue and green respectively. The first of these, when wet, was of a good colour. He suggested that possibly the formation of the bromide had something to do with the changes, and asked for explanations. He had not tried the emulsion in its various coloured states. He had noticed that if the bromide of ammonium had gone wrong it gave a grey film. In answer to questions he said the samples he showed were not of one batch. He always used collodion for lantern slides and transparencies. The minimum exposure was about one minute.

Mr. A. COWAN remarked that all commercial slides were made on wet plates.

Mr. MACKIE said that slides were never made by contact commercially, because of the wear of the negative; and went on to narrate a curious experience of Mr. E. W. Parfitt, who, when making some transparencies on gelatine plates, got admirable colours with clear lights at home, but entirely failed to get warm colours in Mr. Mackie's dark room. He suggested that commercial ammonium carbonate practically contains little carbonate, and might be carbamate.

Mr. T. BOLAS said that could only be determined by experiment. The difference in the respective formulæ was in the carbamate amidogen had replaced some of the hydrogen of the carbonate.

Mr. MACKIE said both samples were apparently alike.

In the course of further discussion on collodion emulsion, Mr. J. D. ENGLAND said he had recently had occasion to test a collodion emulsion made eighteen years ago by Mr. Warnerke. It gave very good results. It had become somewhat thin, but it developed up a clear and dense image.

Mr. H. Chapman Jones, the Hon. Secretary, exhibited some stereoscopic collodion transparencies made on different emulsions, the new mineralised methylated spirit having been used in the preparation of one of the emulsions, the other with the ordinary spirit. That prepared with the mineralised spirit was more sensitive than the other, and appeared to have no disadvantages to set against the extra sensitiveness. Practically speaking, it was advantageous. He had bought the mineralised spirit from the oil shop.

Mr. MACKIE pointed out that the transparencies made with the mineralised spirit were fogged, and did not consider the experiment conclusive.

The sensitometer readings gave eighteen for the collodion made with the unmineralised spirit, and twenty-two for the mineralised emulsion. Opinions, however, were divided as to the correctness of these readings, as also to the accuracy of Mr. Warnerke's claims.

During the evening Mr. H. A. LAWRANCE drew attention to an article in the *Correspondenz* dealing with the different-coloured images obtained with carbonate of soda and caustic potash in the developer respectively, and subsequently quoted an experiment of Herr E. Vogel, in which he emulsified silver bromide in gelatine, removed the gelatine by the eparator, and then emulsified

the haloid in collodion. By an exposure of five seconds the F line of the spectrum was obtained.

After further discussion the meeting closed.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 21,—Mr. J. J. Briginshaw in the chair.

Mr. H. SNOWDEN WARD, being invited to offer any remarks of photographic interest in connexion with his American visit, said that the principal thing which struck him was the bad printing exhibited by the professionals in general. American photographers rather prided themselves on their posing and lighting, but, speaking from a careful examination of New York and Philadelphia work, printing was their weak point. Their vignetting was not good, and in general the prints were faulty. He did not know whether this was to be accounted for by the inability of the workmen or cheapness. Almost all the paper used was freshly sensitised, and they were always told that it produced infinitely better results than the preserved paper; but the printing would not compare with London or provincial work. One thing he noticed, and that was, that large sizes were being much worked in the States, quarter-plate cameras being little known. The favourite small size was 5×4, but even that was little used. 7×5 was the fashionable size: it was used for stereoscopic as well as single-lens work. In landscape photography 48×20 was being used in films for panorama work. Mr. Jackson, of Denver, made it a speciality. One of the results of the use of such large sizes was that the sale of paper was necessarily great. Of the 52,000 reams of albumenised paper made by the Dresden Company, the United States took more than half, the remainder sufficing for the rest of the world. As to photographic societies, the Philadelphia Society and the Society of Amateur Photographers of New York had large premises, and, in fact, went in for everything on a large scale. Many of the Societies had more accommodation than any of the Societies in this country with the exception of the Camera Club.

The paper on *Photography as Applied to the Detection of Crime*, by Dr. Jeserich of Berlin, was read by Mr. A. Mackie.

At its conclusion, Mr. W. E. DEBENHAM mentioned that he had made some experiments on Dr. Jeserich's lines, but by a method reversed to that of orthochromaticism, using a screen dyed with *Bleu de Lyons*. He found it better to use coloured illumination.

A set of Indian and Colonial slides, lent by the Photographic Society of Great Britain to the Association as an affiliated body, was exhibited. These comprised eighteen views of Tasmanian scenery by Mr. F. J. Patterson, of Hobart, Tasmania; fifteen of similar subjects by Mr. Hanson; ten views of Cape scenery were contributed by Mr. C. Ray Woods; Indian scenery being represented by the work of Messrs. Valani & Pipistrello. The collection was much admired.

Mr. F. A. Bridge showed samples of linen and paper treated with an apparently non-actinic medium prepared by Messrs. Christy, of Fenchurch-street. Although intended for surgical purposes, it was the general opinion of the meeting that, if the colour was really non-actinic, the substances would answer well for dark-room illumination. Mr. Bridge mentioned that he had been informed that some of the paper had been exposed to two days' sunlight without bleaching.

Mr. Snowden Ward exhibited a negative which had been stripped from glass by means of a special celluloid solution prepared by Mr. John Carbutt, of Philadelphia.

Camera Club.—April 21, Mr. A. Deed in the chair.—Mr. PRINGLE exhibited a series of lantern slides, illustrating travels in Spain, including a set of pictures taken at a Spanish bull-fight, and some fine interiors and architectural subjects at Seville, Burgos, and elsewhere. Mr. Pringle gave an interesting description of the slides as the exhibition proceeded. Later on, other slides were shown by Messrs. Avent, Ferrero, and Leventhorpe. May 2.—Last social evening and smoking concert of the season will be held at the Club, and on Thursday, May 5 slides, of scenes on the Norfolk Broads will be shown by several members, the description being given by Mr. E. J. Humphrey. Other slides will follow.

North London Photographic Society.—May 3, Lantern Night, to which ladies are invited on the introduction of members.—In order to give opportunity of exhibiting to as large a number of members as possible, it is requested that those who have slides to exhibit will kindly make a selection of twelve from those which they may consider to be their best slides, and will send or bring them as soon as possible after 7.30 on the evening of May 3 with a list of the subjects, so as to allow of arrangement before commencing. The Indian and Colonial set from the Photographic Society of Great Britain will be shown.

Gloucestershire Photographic Society.—April 25, Annual Meeting.—The following were elected officers for the year:—*President:* Rev. Mowbray Trotter.—*Vice-President:* Mr. F. H. Burr.—*Committee:* Messrs. W. C. Beetham, H. S. Crump, W. J. Jenkins, A. H. Pitcher, T. G. Smith.—*Hon. Treasurer:* Dr. Hodges.—*Hon. Secretary:* Mr. W. Walwin. The Secretary's report showed the Society to be in a satisfactory condition financially and otherwise, and, with a series of outdoor meetings arranged, a successful season is anticipated.

Dunedin Photographic Society.—March 18, Second Annual Meeting.—The balance-sheet and annual report were read and adopted. The Society begins its third year with a satisfactory credit balance and an increased membership roll. During the year much useful work has been accomplished. Demonstrations by the members and lantern-slide exhibitions have been given at the monthly meetings. The yearly exhibition was this year held in conjunction with the Nelson Camera Club in Dunedin, and was pronounced a great success. The following officers have been appointed for the forthcoming year:—*Committee:* Messrs. F. M'cuson, C. Morris, W. Melville, R. A. Ewing, F. B. Smith, W. Williams. *Secretary and Treasurer:* H. Livingstone, Royal-terrace.

North Middlesex Photographic Society.—April 25, Mr. W. B. Goodwin in the chair.—Negatives made upon Imperial plates (samples of which had been distributed among the members at a previous meeting) were passed round for inspection, the consensus of opinion of those who had tried them being that they were good in quality and at least as rapid as most ordinary plates. Mr. Gill then developed some plates which had been exposed by some of the younger students, explaining his methods as he proceeded. A number of questions on technical points were asked and answered, and Messrs. Warne and Gill passed round hand cameras of novel construction, and explained the methods of working them. Some curious and beautiful prints were shown, and a method of mounting prints to secure them from the effects of damp was explained by Mr. Cox. The first field-day of the season having been held on Easter Monday at West Drayton, when nine members attended, prints from the negatives taken on that occasion were entered for competition. The vote of merit was secured by Mr. H. Smith for his print entitled *Steady*, in which an angler, who had been fly-fishing, was anxiously directing his assistant to secure the catch. Mr. Smith then reported that eighteen members and friends had attended the field-day on Saturday, the 23rd inst., to Edgware and Stanmore. The next meeting of the Society will be held on Monday, May 9, when the last exhibition of members' slides during the season will be given.

Kensington and Bayswater Photographic Society.—April 25, Mr. J. E. Hodd in the chair.—Mr. J. HOWSON gave a paper on the Ilford gelatine printing-out paper and isochromatic plates. His demonstration was accompanied by specimens showing the difference of results obtained by variety in manipulation. He stated that gelatine printing-out paper was invented in 1885, and prints exist which were prepared in that year, and show no sign of fading or discolouration. The advantages claimed for this paper are its permanence, good printing qualities, its price, its convenience in cutting, and the absence of water-mark edges. Mr. Howson stated that the toning bath should never be warmed, as the effect of a bath much above 50° Fahr. would be to cause a yellowness of the print. The effect of insufficient washing previous to toning is to spoil the toning bath and affect the permanency of the prints. If burnishing is intended, the alum bath should be used. Mr. Howson next pointed out very clearly the difference between "isochromatic" and "ordinary" plates, and the advantages possessed by the former over the latter, as in the case of photographing flowers and trees. The plates are assisted in their isochromatism by the use of a yellow screen (of specially prepared glass) placed inside the camera, immediately behind the lens. The emulsion of these plates differs from that of the ordinary in that it contains "eoside of silver," a chemical which is extremely sensitive to yellow rays.

West London Photographic Society.—April 22, the President in the chair.—Mr. ROLAND WHITING read a paper on the *Artistic Improvement of Negatives*. A discussion ensued, which, together with the paper, embraced too wide an area to do justice to in a necessarily condensed report. The Secretary reminds the members to let him know by the 30th inst. whether they want more than one ticket for the dinner on May 13.

South London Photographic Society.—April 20, Demonstration of *The New Cold Bath Platinum Process*, by Mr. F. W. Edwards, the President.—The paper was first brought before the Camera Club Conference a week or two ago, and had not since been demonstrated at any Society, and was not yet purchasable by photographers. It differed from the old cold-bath process inasmuch as the platinum is used in the preparation of the paper, and not added to the developing bath. The troubles arising from evaporation of the developer, and the destruction of the dishes in the hot bath process, were done away with by the use of the new paper, as also were the difficulties caused by bubbles and streaks, Mr. Edwards stating that he considered it to be "the printing process of the future." Results could be got from their negatives which it would be simply impossible to do with the older method. The deposit of platinum is very much finer, and there is also a freedom from granulation. Velvety shadows are obtained with very pure whites. A portion of the print can be developed at a time without showing any line or marking, thus doing away with the necessity of using large dishes. By using the bath colder over-printed pictures can be brought up, and under-printed ones by using it warmer. It is impossible to over-develop a properly printed picture. Prints are made until a faintly printed image is obtained on the paper, when they are developed in a bath of oxalate of potash (one pound in sixty ounces of water). After development they are treated with three baths of hydrochloric acid, one in sixty, to remove the yellowness, and afterwards washed to get rid of all traces of the acid. The President, after demonstrating the working of the process, offered the prints for sale for the benefit of the funds of the Society, when upwards of 3*l.* was realised. The excursions to Canterbury (on Easter Monday) and Dulwich Village (April 23) were very successful, and many good negatives obtained.

Brechin Photographic Association.—April 20, Mr. H. Braid (Vice-President) in the chair.—The Secretary (Mr. J. D. Ross) was appointed delegate to the Photographic Convention meeting in Edinburgh during week beginning July 11. A letter was read from Mr. W. T. Stead anent the National Society of Lanternists, and a number of those present agreed to become members. Mr. J. Mackie, jun., and Messrs. Day & Maw (Forfar and Brechin Railway) were balloted for and admitted members. Set No. 2 of the American Lantern Slide Exchange were then exhibited, and evoked, on the whole, very favourable criticisms. The SECRETARY reminded the members of the desirability of having the set of slides illustrative of linen manufacture ready early in the autumn. Lord Provost VALLENTINE thought that, in view of the establishment of technical schools throughout the country, slides illustrating such subjects would be very useful. Mr. J. H. LAMB concurred, and it was agreed that, as soon as the slides were ready, and before a lecture was written to accompany them, they should be exhibited at a meeting, to which all interested should be invited. Mr. A. R. MCLEAN MURRAY, who read the notes on the American slides to Mr. Innes, who worked the lantern, and to the Chairman, closed a very pleasant meeting.

Derby Photographic Society.—April 19, Mr. R. Keene presided.—Mr. A. C. RILEY gave a lecture entitled, *The Production of Copper Plates by Photography*. This gentleman, in a very simple manner, described the process

dating from the time of Fox Talbot to the present day, showing, as he proceeded, copper plates in various stages of being produced. Mr. W. Morris, St. James's-street, was elected a member. Mr. Keene showed several prints by the new kallitype process, and a number of platinotypes were also shown by Mr. T. Scotton, which had been developed by a new method with excellent results. A library was started a short time ago, with which the members are well pleased, several of them making use of it.

Lincoln Camera Club.—The inaugural meeting of this newly formed Society was held in the large hall of the Church House on the 8th inst., and proved a great success, the attedance being large. The Mayor (Mr. W. W. Richardson) presided, and was supported by the Sheriff of the City (Mr. Alex. Trotter). In the unavoidable absence, through serious illness, of the President of the Club (the Rev. Dr. Stott), the inaugural address was given by the Rev. T. Gough, B.Sc., F.C.S., Headmaster of the Retford Grammar School. After indicating the aims of the Lincoln Camera Club as being the improvement of the quality of the work done by the amateur photographers of Lincoln and neighbonrhood, as the result of mutual co-operation and study among the members of the Club, assisted, as they doubtless would be, by the professional talent for which the city of Lincoln is so famous, the lecturer proceeded to give a rapid sketch of the aims and processes of photography, illustrating his points by means of a beautiful series of lantern slides, the work mainly of the President and himself. The contention that a photograph might be an artistic expression of the beautiful, and that the worker with the camera could recognise and perpetuate the beautiful alike in simple, homely, every-day scenes, and in the more striking phenomena of nature, was established by pictures of scenes on canal and river banks, the simple cottage, snow-clad churchyard, woodland groves, and the grandenr of our Cornish coast, with instantaneous pictures of terrific seas hurled up against its mighty cliffs by the fury of an Atlantic gale. Passing next to the processes of photography, by means of beautiful diagrams the lecturer explained the action of the photographic lens in the camera in the formation of the picture that falls upon the sensitive plate, showing the analogy in its action to that of the lens in the human eye. The changes produced in the sensitive film by the action of the light, and the nature of the negative picture thus obtained were next discussed, and some of the processes for obtaining positives explained. Finally, the lecturer showed the extraordinary extent to which photography was now, by aid of the lantern, applied to the teaching of many branches of knowledge, illustrating this part of the subject by a large number of beautiful slides on astronomy, botany, zoology, and microscopic objects, showing what a powerful instrument photography and the lantern have placed at the disposal of teachers of these subjects. Information respecting the Society can be obtained of Mr. W. R. Lilly, Norwood House, or Mr. Jas. Horton, Brayford, who are the Hon. Secretaries. The affair has been taken up with much enthusiasm by local photographers, and already close on fifty members have been enrolled, so that the Club bids fair to have a most satisfactory start in life. The Club has been founded for the study and practice of photography in all its branches, and is open to all taking an interest in "the black art," be they amateur or professional. Meetings are to be held twice a month during the season, and excursions are to be made during the summer months to various places of interest. The following constitute the officers of the Club:—*President:* Rev. Dr. Stott, Treswell.—*Vice-President:* Mr. Henry Mantle.—*Committee:* Messrs. W. J. Cant, T. Bell, Rev. Canon Fowler, B. Vickers, R. Slingsby, Asquith, G. Hadley, Birkbeck, and C. Smith.—*Hon. Librarian:* Mr. J. E. Dickinson.—*Hon. Treasurer:* Mr. J. M. Warrener, the Moorlands, Bracebridge.—*Hon. Secretaries:* Mr. W. R. Lilly, Norwood House, Lincoln, and Mr. J. W. Hortou, Brayford, Lincoln. We might state that the library has already been started, several books having been obtained. It is proposed to fix up a laboratory, with dark room, &c., for the use of the members.

Midland Camera Club.—April 22, Rev. J. Henry, F.R.C.S. (Vice-President), in the chair.—Being a Members' Lantern Night, there was a fair gathering of friends and visitors, including many ladies. Slides were shown by the following members:—Mrs. Welford, Dr. Maberly, Jevons Fowler, William Bentley, Rev. J. Henry, G. Warren, T. J. Perry, and W. D. Welford. Slides by John Carpenter (floral studies) and P. H. Fincham (Italian views) were also shown.

North Wales Amateur Photographic Society.—April 18.—A large muster of Llandudnoites and visitors assembled to witness the exhibition of a quantity of lantern slides, kindly lent by local slide-makers. They were shown by the fifty-guinea Beard's oxyhydrogen lanterns, recently purchased by Mr. Hughes, of Rochester House. This machine gives a brilliant and perfectly sharp image twenty-five feet in diameter. The slides were described by Mr. W. A. Whiston, genial Principal of the Llandudno Collegiate School. Some of the views and seascapes were the work of Mr. A. R. Dresser, Messrs. Gibson, of Hexham, and Lyd Sawyer, of Newcastle. Some twenty slides of local views were lent by Mr. I. Slater, of Mostyn-street, Llandudno. One view of Gloddaeth Hali is very fine indeed, and, in order to obtain it, Lady Mostyn had a lofty stage erected, under Mr. Slater's direction, for him and his camera. This is a hint to other patrons not to begrudge a few pounds when the expenditure will add to the beauty of the resulting picture. At Gloddaeth the gardens slope abruptly from the front of the mansion, and the erection was built of such a height and at such a distance that a rapid rectilinear lens would cover and include the whole building. This incident occurred during the visit of the Queen of Roumania to Llandudno eighteen months ago. The two dark rooms belonging to the North Wales Society at 44, Mostyn-street, are open daily for visitors till half-past ten p.m. Billiard and reading-rooms are adjoining, so that visitors can play while the hypo is finishing their plates. The dark rooms are fitted with Argand gas lamps, rose water-taps (*i.e.*, taps with a rose), hypo baths, and washing tanks. Plates and developers can be obtained at the counter.

Rochdale and District Photographic Society.—April 23.—The members of this Society had a very pleasant and enjoyable ramble to Hopwood Hall and Woods. After a short walk the grounds were reached, and the members at once set up and commenced work. Several plates were exposed on the old Hall itself, and the grounds and woods around also came in for a large share of attention, there being several very pretty and artistic bits. No difficulty was found in getting suitable subjects for the cameras. The Society has closed the rooms in Bury-road this week, and in future the meetings will be held in one of the local hotels, not yet decided upon. All correspondence must be directed to the Secretaries, W. and S. Ingham, 30, Freehold-street, Rochdale.

Correspondence.

☞ Correspondents should never write on both sides of the paper.

PERSONAL.—THE LATE HACKNEY EXHIBITION.

To the Editor.

Sir,—As we learn that it is the opinion of both yourself and Mr. Andrew Pringle that some remarks, appearing in our monthly trade circular, may be by others misconstrued to mean that we impeached your honesty and probity generally in regard to the judging at the late Hackney Exhibition, we should be pleased if you would do us the favour of publishing our sincere regret that any remarks should have so appeared that could even bear the semblance of such a meaning.

In our opinion, they cannot fairly be so interpreted, as, if they could, they would most certainly be untrue, and therefore would not have been published by us, as we know of no one who would even inwardly suppose that either of you would be guilty of any act that could be termed dishonest.—We are, yours, &c.,

Adams & Co.

81, *Aldersgate-street, London, E.C., February* 13, 1892.

[Although the above letter was addressed to us in a personal, as distinct from an editorial, sense, we accede to Messrs. Adams' request for its publication.—Ed.]

AN ACKNOWLEDGMENT.

To the Editor.

Sir,—I find that the Table relating to the sizes, pressures, capacities, contents, &c., of gas cylinders, given by me in the *Optical Lantern*, is the copyright of the Scotch and Irish Oxygen Company. I copied the Table, with slight alteration, from the *Indispensable Handbook to the Optical Lantern*, and acknowledged the source; but, as no statement is there made about copyright, I could not know that the Table was so protected. As, however, it is copyright, I gladly acknowledge the ownership.—I am, yours, &c.,

Andrew Pringle.

April 23, 1892.

"PHOTOGRAPHIC PORTRAITS."

To the Editor.

Sir,—I made a mistake in describing the publication which has gone out of its way to attack Mr. Maskell and Mr. Davison (the latter gentleman being now the recipient of one of those after-event apologies which serves merely to intensify the original insult)—I say I made a mistake in describing this publication as the trade organ of "opticians," and my thanks are due to Mr. Maskell for enabling me to rectify the slip. It has, of course, all along been plain, even to the casual reader only, that the paper is at the beck and call of *one* optician, whose fondness for newspaper controversy has more than once manifested itself in your own pages. In fact, an acquaintance with his style of writing even induces me to ask whether that gentleman himself did not actually produce the offending effusion, and if the leading article of April 21, in which your contemporary indulges in a little gas and high falutin' of the "We'll-stick-to-our-guns-to-the-last" style, and at the same time confers upon me the dubious honour of quoting and agreeing with some of my own remarks, does not exhibit indications of having also come from the master-hand which has lately bestowed so many remarkable things upon a grateful photographic public?

Mr. Maskell is unable to agree with me that this hostility to photography of the Indefinable School proceeds from the cause I assigned to it; I am sorry he cannot himself tell us what he believes it to be. Is he innocent enough to imagine that anyhody but an angry tradesman could be so alarmed over a few blurred photographs as to subsidise a newspaper to write them and their authors down? I should be glad to have Mr. Maskell's answer to that question. He flatters me in casting upon me the task of finding the grounds of excuse of the attack, an honour of which, however, I shall not try to deprive him. I regard it as calculated to perpetuate the practice of prostituting photography to the eccentric fads of the No-focus School to enter into any further argument with Mr. Maskell on the matter, and therefore I will ask him to let me leave him to find out (if he can) the cause of your contemporary's attack upon him and his friends. Of this, however, he may be sure—that, accepting the reason I have given, opticians generally, from what I can gather, so far from sympathising with the chagrin of one of their number, regard the productions of Mr. Maskell and his friends with mingled amusement and contempt.

Neither personally nor in print is Mr. Maskell a very amusing man,

and yet in his letter he has contrived to give me material for some good fun. Fancy him sitting down on Easter Sunday, pen in hand, wondering who on earth Cimabue Brown, jun., is, owning that he never heard of him before, and then "inclining to surmise" (only inclining) that "the name is a pseudonym!" Shade of Du Maurier! didst thou invent a Postlethwaite and a Cimabue Brown for this? But whether the pseudonym veils a distinguished identity or not is of little consequence, except in so far as it gives Mr. Maskell the opportunity of indulging in the stereotyped sneer at an anonymous correspondent. Perhaps Mr. Maskell himself supplies the best reason why opticians and others should in future treat Mr. Maskell and his friends with indifference, and that is that, numerically speaking, the new school is so small as to be beneath notice.—I am, yours, &c.,

CIMABUE BROWN, JUN.

April 25, 1892.

THE ACTINOGRAPH SPEED OF DRY PLATES.

To the EDITOR.

SIR,—In order to meet the wishes of numerous amateurs who desire to get the actinograph speed of plates of other make than our own, Mr. J. Sterry, of Earlswood-road, Redhill, has kindly consented to determine their speed by the Hurter & Driffield method, charging a small fee.

We speak from experience when we say we know this gentleman is thoroughly competent to undertake this testing.—We are, yours, &c.,

22 *and* 23, *Soho-square, London, W., April* 25, 1892. MARION & Co.

[We have also received a communication from Mr. Sterry to the same effect.—ED.]

"SPEED" OF PLATES.

To the EDITOR.

SIR,—As you are ever ready to lend a helping hand to the cause of photography, may I ask you to assist in (as public a manner as possible what is, or will shortly be, a desideratum to workers in the art?

Among those who have studied Messrs. Hurter & Driffield's system for obtaining correct exposures, there can scarcely be a second opinion as to the truth of their deductions; but the value of their discovery can only be fully appreciated by workers knowing the "speed" of the various brands of plates. To obtain correct exposure, which is the first essential towards a perfect negative, one must know four things—(1), the day and hour; (2), the focal length of lens and ratio of each separate stop; (3), the condition of the light; (4), the speed of the plate. This last element can best be determined by the maker of the plate. There must necessarily always be something left to personal equation, and in most other actinometers it is, in regard to the colour of a strip of prepared paper as acted on by the light, about the period of exposure. But the value of colour, it goes without saying, varies in different individuals in a most marked degree. This is not left to the individual's personal equation in Messrs. Hurter & Driffield's system. I have tried several actinometers, and find Messrs. Hurter & Driffield's unquestionably the most correct. I obtained my instrument from Messrs. Marion & Co., who, I notice, place on each packet of plates the correct speed of that particular batch. Other persons use other plates, and probably are as satisfied with their several plates as I am with mine. Could you not, *ex cathedrâ*, suggest to the various makers the advisability of indicating on each of their issues the "speed" as applied to the Hurter & Driffield's actinograph? To those who do not use that special instrument no harm could accrue; but to those who do it would prove an inestimable boon.—I am, yours, &c.,

Thurning Rectory, Oundle. J. CARTER BROWNE, D.D.

HOW TO AVOID THE MURKY SMELL OF THE OIL LANTERN.

To the EDITOR.

SIR,—It may be of great interest to many of your readers who use an oil lamp to know that the disagreeable smell so often experienced may be totally avoided by adopting the following precautions:—

When the lamp is done with, all the oil that can be got to run out should be poured off; then the wicks should be relighted, and allowed to burn right out. The lamp may then be put away.

It must not be charged with oil again till it is in position and about to be used, when no smell of any disagreeable character will be noticed.

By carefully adopting this method, what has been an unmitigated nuisance and deterrent to the use of the Sciopticon and other form of oil lamps will be avoided, and much pleasure experienced when showing the slides, where formerly annoyance and bad smells pervaded the exhibition.—I am, yours, &c.,

FRANK HOWARD.

Camera Club, April 25, 1892.

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

To the EDITOR.

SIR,—I take the liberty to request you to publish the following information about the Edinburgh meeting of the Photographic Convention in July next, which I believe will prove interesting to your readers, especially to those who are members.

Miss Catherine Weed Barnes, of New York, will read a paper on "Amateur Photography in America." Mr. Andrew Pringle will give an address on "Photography in Relation to Pathology." Mr. C. H. Bothamley has promised to give a fourth lecture on "Orthochromatic Photography." Mr. H. P. Robinson will also send a contribution on "Individuality in Photography."

Other papers have also been promised, and I will send you a further communication on the subject.—I am, yours, &c.,

F. P. CEMBRANO, JUN., *Hon. Sec.*

10, *Cambridge-gardens, Richmond, Surrey, April* 25, 1892.

A NATIONAL PHOTOGRAPHIC RECORD SURVEY.

To the EDITOR.

SIR,—As I have to read a paper—*Proposal for a National Photographic Record and Survey*—before the Photographic Society of Great Britain on May 10, may I ask secretaries of societies, or any individuals who have commenced survey work, and with whom I have not been in communication, to kindly send me details as early as possible, so that I may be able to give them due credit and publicity.—I am, yours, &c.,

Birmingham, April 25, 1892. W. JEROME HARRISON.

DEVELOPMENT ON THE SCREEN.

To the EDITOR.

SIR,—I have always used the ferrous oxalate for this experiment, owing to its being so non-actinic. Pyro or hydroquinone would, no doubt, do if a yellow glass were interposed between the light and the plate. No doubt, also, one of the very slow bromide lantern plates could be used instead of chloride.

I have not tried, but would suggest, as possibly a pretty experiment, to bleach a chloride plate with mercury and then redevelop with hypo. Could not a carbon transparency be used? The gradual dissolving of the soluble gelatine would be seen very well.—I am, yours, &c.,

The Hut, Ingatestone, April 25, 1892. H. G. M. CONYBEARE.

PRINTING-OUT CHLORIDE PAPER.

To the EDITOR.

SIR,—Would not paper that was to be used for printing out require to be very kept from white light? In the process of manufacture it is not improbable that paper which the manufacturer expects will be printed out may be exposed to enough white light to render it useless for development.—I am, yours, &c., Q.

Deal, April 21, 1892.

[We have a leading article on the subject elsewhere. Probably the exposure the paper undergoes in the manufacture would not interfere with its developable properties.—ED.]

EXHIBITION AT BATH.

To the EDITOR.

SIR,—Permit me to draw attention to the enclosed projected show of photographs and apparatus to be held in May next. Contributors will be permitted to affix name and title on their work, and, if professional, the price. No entrance fee, no award, no costs of carriage.

The Sub-Committee appointed by the Bath Photographic Society are working in earnest, and the experiment is regarded as one highly probable to succeed and, in time, to increase in usefulness. Already many well-known amateurs have promised to contribute, and the manufacturers will be well represented.—I am, yours, &c.,

W. M. ASHMAN, *Hon. Secretary Bath Photographic Society.*

12A, *Old Bond-street, Bath, April* 20, 1892.

[The following are the particulars.—ED.]:—

FLORAL ART AND INDUSTRIAL EXHIBITION, BATH, MAY 18 AND 19.

SECTION B.—(Art Department). Photographic Exhibits.

Amateur: 1. Views; 2. Genre; 3. Flashlight Photography 4. Scientific; 5. Lantern Slides. *Professional:* 6. Portraiture; 7. Enlargements; 8. Views; 9. Lantern Slides; 10. Apparatus of recent introduction; 11. Early Specimens of Apparatus and Photographs; 12. Other Exhibits of interest besides those above mentioned.

Exchange Column.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:
T. S. Lisson, Westmoreland.—*Photograph of Deer in Leven's Park.*
James Downey & Sons, South Shields.—*Photograph of Mr. John L. Richmond.*

J. H. HARVEY (Melbourne).—Your suggestion shall be considered.

W. E. C. B.—The cause of the spots is imperfect fixation of the prints.

OPAL.—Messrs. Morgan & Kidd, we believe, supply bevelled opals to the trade.

PLATINIC.—There is no metal recoverable that would repay for the trouble involved.

J. C. P.—The quantity of pyroxyline should in both cases be twenty-five grains. The emulsion would be suitable for opals.

SYPHON.—If you mean Mr. Buchillot, the address is Southampton-row. The address of the Autotype Company is New Oxford-street, W.

JOHN STERRY.—Thanks. As you will perceive from our correspondence columns, we have already received a letter from Messrs. Marion on the subject.

A. G. BRADY.—The primuline process is patented, but no doubt you can obtain a licence to work it. Write to Messrs. Green, Cross, & Bevan, 4, New-court, Lincoln's-inn, W.C. The materials are not expensive.

W. SHERRELL.—If you will refer to pages 322 and 337 of the volume of the JOURNAL for 1891, you will find two articles treating on the addition of sal ammoniac to the developer, which will give you the information you desire.

S. A. W.—If a photographer supplies bromide prints for platinotypes, he is committing a fraud upon his customers quite as great as the man who supplies margarine for butter, and brings himself within the pale of the law if the customer chose to take action.

COPYIST.—The formulæ for orthochromatising plates given in the ALMANAC are amongst the best that have been published. You may certainly rely upon what Mr. Bothamley has written on orthochromatic photography generally. There is, as you remark, plenty of room for further experiment.

TOURIST.—If you intend to travel with your camera anywhere on the Franco-German frontier, you should certainly provide yourself with a passport. You must bear in mind, however, that the possession of one will not protect you from inconvenience if you set up your camera in the neighbourhood of any of the forts.

PRINTER writes: "Would you kindly tell me if silver prints, placed in a solution of sulphuric acid after fixing, are rendered less likely to fade? and, if so, what strength the acid bath should be, and how long the prints may remain in it?"—If fugitive prints are desired, the proposed treatment would be one of the best methods of producing them.

C. BENTON writes a long letter in which he attributes the entire cause of fading to the deleterious cards upon which the prints are mounted, and contrasts them with the cards that were used thirty years ago. Doubtless some mounts have a very destructive action on the prints put upon them, but it is useless to argue that the mounts are the sole cause of the fading of silver prints. If it were, then all unmounted prints should be permanent. Are they?

J. T. C.—Although a portrait lens is the quickest in action, it is not the best to use in taking a group of a hundred or more people, on a 12×10 plate, out of doors. In order to secure good definition in the different planes, and sharpness to the edges of the plate, it must be considerably stopped down, so that its rapidity becomes reduced to that of, say, one of the "rapid" type, without any corresponding advantage. Indeed, the latter will be found the better instrument of the two, in practice, for that class of work.

C. RAY.—None of the well-known dry-plate makers will purchase old negatives for the purpose of cleaning off the films and recoating the glass. The only way we can suggest of dealing with them is to pay the dustman to take them away. You might, however, clean off the films with the view to recovering the silver from them, and then disposing of the larger-size plates to some nurseryman for glazing greenhouses; but whether this would recoup you for the time and trouble involved you are better qualified to form an opinion than we are.

"PHOTOGRAPHIE," who wishes to know the best camera and stand, half-plate size, for travelling with to take views, and to be also used for indoor work, photographing samples of goods, and which lens we consider the best for both purposes—in fact, complete kit, and the price—and also asks us to say which we consider the best and quickest developer, disregards our rules in not enclosing his (or her) name, and, if a reader of our pages, should know that we always decline to say which we consider the "best" camera and the "best" lens.

R. W. says: "The other day I took the interior of our parish church. It is a very dark one, as most of the windows are of stained glass. I gave it an exposure of half an hour, and it is fully done; but the extraordinary point in connexion with the picture is, that in one of the corners there is, on a plain piece of wall, a window that is on the other side of the building, and could not be seen on the focussing screen when the camera was replaced in precisely the same spot the next day. Can you suggest any reason for this strange phenomenon?"—The explanation is very simple: There is a minute hole in some portion of the camera or the bellows, and that has acted the part of a "pinhole camera."

H. WILLETT writes: "Shall be glad if you will inform me what the law is as regards exhibiting of specimens. Can a person compel a photographer not to exhibit a photograph? Is there a law to make him take it in from case?"—Whatever may be the state of the law on the point, a photographer has no moral right whatever to exhibit a portrait without the sitter's permission. If a portrait is shown to the annoyance of a sitter after a formal notice for its removal has been served, no doubt an injunction to restrain could be obtained; then the photographer might be mulct in heavy costs. In one case a sitter took the law into his own hands, and smashed the portrait and case, and was summoned for it. The judgment was, if we mistake not, that he was justified in destroying the portrait, but he had to pay for the glass, and the photographer lost his costs.

S. W. writes: "Two years ago I took an apprentice, with a premium, for three years. The friends of the youth now complain that I am not thoroughly teaching him the business, and are threatening me with legal proceedings for the recovery of the money and services rendered. They say that I should teach him such processes as wet collodion, carbon printing, enlarging by different methods, retouching, taking landscapes, &c., things I do not do myself. Is this reasonable?"—Yes. If you have taken a premium, and engaged to teach the youth photography, he is quite entitled to be taught these and other things in connexion with the business. If you took the money only to teach him how to take a negative and print from it in silver, such should have been stated in the indentures. Unless this was done, those who paid the money have good ground of action, and will, doubtless, recover.

F. HALL writes: "I want to convert some silver sulphide into pure nitrate Can you kindly tell me how I can do it without the aid of a fire? By this I mean by a process without fusing, or any process of that sort. In looking the subject up, I see there is an article on it in the JOURNAL of June 7, 1889, in which it says that it can be dissolved in pure nitric acid. I have tried this, and find it will not dissolve to any extent; also the little that is obtained is not pure, but mixed largely with impurities. I want the nitrate for experimental purposes and for a wet-plate bath. If you can help me, I shall be very much obliged."—If the directions as given be carefully followed, nitrate of silver will be obtained; but, if *chemically* pure nitrate be required, instead of crystallising the nitrate first obtained, the silver should be precipitated from it as a chloride. The chloride then, after thorough washing should be decomposed by pure zinc and sulphuric acid, washed, treated with sulphuric acid to remove any undissolved zinc, again washed, and the pure silver thus obtained dissolved in nitric acid and crystallised. The simplest and most economical plan is to send the sulphide to the refiner, and get from him in exchange either nitrate of silver or cash.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—May 5, *Wet Collodion*, adjourned discussion. 12, Members' Open Night. 19, Monthly Lantern Night.

WE are happy to announce that Mr. F. E. Ives, of Philadelphia, has arrived in this country, and on May 10 and 17 lectures at the Royal Institution on *Photography in the Colours of Nature*.

PHOTOGRAPHIC CLUB.—May 4, *Hand Cameras up to Date*. 11, *Fancy Printing and Mounting*. Outing, Saturday, April 30, to High Beach. Train from Liverpool-street for Loughton, 2.35.

ON Tuesday, May 17, Mr. A. W. Dawson gives a demonstration on *Photogravure* before the Photographic Society of Great Britain. We understand that on this occasion a large number of prints will be on view in illustration of the process.

FROM the London Sensitised Paper Company we have received a small sample of their "Sans Egal" sensitised paper, which, upon trial, we find to print quickly and tone easily, in the ordinary acetate bath, to a most agreeable warm colour.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—May 2, Demonstration in *Carbon Printing*, by the Autotype Company. 7, Excursion to Greenwich. 16, *Stereoscopic Photography*, by W. I. Chadwick, Manchester. 21, Excursion to Loughton for High Beach.

MESSRS. PERKEN, SON, & RAYMENT ask us to state that, having entirely sold out the third edition of the *Beginners' Guide to Photography*, which completed the twenty-fourth thousand, they are just issuing a fourth edition of the usual number, 8000. It is to be sold, as usual, cloth covers 6*d*.

AN amateur photographic exhibition will be held at Castle Wemyss on the 27th and 28th of May, 1892. Section I. is open to amateurs who have photographed under two years from June 1, 1892. There are two classes:—(1) Portrait or Group, any process; and (2) Landscape or Seascape, any process. Section II. is open to all amateurs, and there are seven classes as follows:—(1) Portrait or Group, any process; (2) Landscape or Seascape, $8\frac{1}{2}\times6\frac{1}{2}$ and over, any process; (3) Landscape or Seascape, 8×5 and under, any process; (4) Instantaneous, any process; (5) Animal Study, any process; (6) Enlargement, any process; (7) Lantern Slides, any process (set of six). All entries must be made to Miss Burns, Castle Wemyss, Wemyss Bay, on or before May 20.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1670. Vol. XXXIX.—MAY 6, 1892.

PLATINOTYPE MODIFICATIONS.

The latest modification of the platinotype process is so very simple in practice that we can perfectly sympathise with several experienced platinotype printers who have remarked, almost in a spirit of complaint, that platinotype has now been made too easy. This feeling on the part of trade printers and others is not difficult to realise when we consider that Mr. Willis, in the latest outcome of his experiments, has not only swept away at a stroke sundry difficulties of working attendant upon the hot-bath process, the popularity and advantages of which remained undiminished by the cold-development, platinum-in-the-bath paper, which was brought out in 1888, but has also imparted to the sensitive coating a variety of useful properties, which reduce to the minimum the chances of failure arising from imperfect manipulation of the paper. In brief, the new paper, so far as quality of result is concerned, entrusts so little to the skill of the printer, as compared with the hot-bath process, that it may be seriously questioned whether the art of printing from the negative in platinum is capable of undergoing any further simplification at Mr. Willis's hands.

The old cold-bath process attracted little favour on account of the uncertain qualities of the pictures it produced, and the difficulty of arriving at the causes of the failures, with a view to their prevention. Mr. Willis has indicated some of the causes which tend to produce this uncertainty in cold development. The rate of solution by the developer of the soluble salt on the paper, he points out, must not bear too large a ratio to the rate at which the pigment-forming salt is reduced. If the salts on the paper were dissolved before any reducing action commenced, no image could be formed, and, on the other hand, if there were only a small portion of undissolved salt on the paper at the moment of development, the image formed would be weak. Temperature governs both the rapidity of reduction as well as the rapidity of salts on the paper, and, as these rates do not vary according to the same law, there are, as Mr. Willis further says, two factors to be dealt with. The ratio which these two velocities bear to one another at a given temperature governs the results obtained. In the new paper, to quote Mr. Willis again, rapidity of solution of the salts does not overtake rapidity of reduction, and thus the image is developed before the image-forming salts are removed from the paper.

Within the last few weeks we believe experience of the new paper has not only confirmed some of the original claims made on its behalf, but has also admitted of others being urged. For example, Mr. Willis laid down the temperature of development at from 50° to 70° Fahr., but we gather that it has been found practicable to use the bath at a temperature as low as 40°. When we add that, at a normal temperature, development takes some thirty seconds or so before starting, and that the developing solution employed need not differ in composition or strength from that used with the hot-bath process, we have indicated the cardinal points of difference from, and resemblance between, the two processes, the details of the preparation of the new sensitive surface, of course, not being available. But nobody's curiosity on this point will, we conceive, outlast a feeling of thanks to Mr. Willis for having relieved the platinotype worker of the spirit lamp, the thermometer, and the iron dish.

As to the qualities of the pictures yielded by the new method, we have satisfied ourselves that in fineness of deposit, in crispness of detail, in vigour and depth of shadow, and in range of tones, the cold-bath paper has the best of the comparison with the hot bath. There is, indeed, a uniform richness of deposit throughout the scale, which was often sought for vainly in prints produced by hot development—the latter sometimes having a flatness and slatiness of tone not always referable to errors in exposure or development. As to the former class of errors, with the new paper Mr. Willis has, we suppose, modified his original ideas. At the outset he recommended hypophosphite of soda as a restrainer in over-printing; in practice, however, simple dilution of the developer answers admirably, while, with under-printed proofs, heating the developing solution provides a remedy.

But it is in respect of those properties of the sensitive compound to which we have made allusion above that we think the new paper possesses a peculiar value. It is, so to speak, far less tender to the touch of accidental ill treatment than the surfaces it has displaced, and on that score it is assured of a freer welcome in the printing room than they. Air bubbles, if they form, do not leave any mark behind, and indeed, to push this property to a critical extent, the paper may be developed in sections, and when the entire print is finished it presents an appearance of homogeneity inconsistent with the method of its development. Again, accidental finger-marks, when made with the developer in the undeveloped print, do not show after development. The "unbreakability" of the surface is proved by the fact that a fold in the exposed paper leaves after development no visible mark. Finally, but not to exhaust the list, development may be accomplished as easily and as efficiently by a brush as by flotation, a fact which we are inclined to think may, in skilful hands, be taken advantage of in the production of artistic results from inferior negatives not otherwise within reach.

It will be seen that the latest advance in platinotype printing is a distinct and welcome one. That it will tend further to popularise a beautiful and favourite process we have little hesitation in conjecturing. It has left Mr. Willis no more worlds to conquer, but it has earned him the thanks of all

lovers of platinotype printing. We do not know whether paper giving sepia tones is amenable to cold development; if so, we await its appearance with interest, inasmuch as, in the present ascendency of warm tones, sepia-toned platinotypes by the new cold-bath process should be very popular.

THE EMPLOYMENT OF STOPS IN LANDSCAPE WORK.

The landscape photographer of to-day works under very different conditions, both as regards lenses and plates, to his congener of twenty years ago; but it may be seriously questioned whether, taking into consideration the great improvements that have been made in his instruments and materials, he surpasses or even equals the best work of that period. The only, or, at any rate, the chief advantage those improvements have had for the modern worker, in too many cases, has been that he is enabled with less trouble and effort to produce fairly good work, whereas his predecessor was compelled to exercise every care in, and devote no small amount of intelligence to, the proper carrying out of his various operations.

Looking to the optical side of the question, one cannot but be struck by the vast difference that exists between the instruments in common use at the present time and those that were almost universally employed even as late as only twenty years back. No photographer—except those who are satisfied with the very cheapest of apparatus—now feels himself properly equipped unless he is armed with a lens of the "rapid" type, and these, of very excellent quality, are obtainable at comparatively reasonable prices. But at the period referred to, although such lenses in various forms were in existence, their high price deterred the majority of workers from giving up the single landscape lens with which they had been so long familiar, and few amateurs, or even professionals, except such as made landscape work their sole business, employed any but the old favourite.

In those days of long exposures—for even the relatively small number of wet-plate landscape workers were badly handicapped in comparison with their modern brethren—the cry was for optical improvements, and this in spite of the rapid form of lenses that were already available. These, it is true, were usable under certain conditions with a far larger working aperture than was possible with the single lens, but it was at the cost of diminished depth of focus and general covering power; and the landscape workers of that day declined to relinquish quality of result for mere rapidity of working.

Now, on the other hand, the tendency is rather in the opposite direction, and the modern amateur is all too prone to utilise to their utmost the vastly increased powers placed at his disposal, to the almost total disregard of results. Thus we find many amateurs who would no more think of going out for a day's landscape work without an instantaneous shutter than of leaving the lenses at home, and who would scarcely feel happy unless their plates were of the most rapid kind. It has been so frequently pointed out that, though it is an invaluable power to be able to make drop-shutter exposures when circumstances compel, still it is in the highest sense foolish to make a practice of doing so indiscriminately. We have seen many amateurs at work on foliage subjects, with the shutter, or "off-and-on" cap exposures, but we can truly say we never saw a really good result therefrom, that is to say, a result that would not have been greatly improved in some or all respects by a longer exposure. The Shakesperian proverb says truly, "'Tis well to have a giant's strength, but 'tis tyrannous to use it as a giant."

There are several arguments that might be brought forward by the old time landscapist in favour not so much of long exposures as of using the stop in preference to the full aperture of the lens. The one is, of course, a concomitant of the other, but not even the strongest partisan of "old times" would preferably give five minutes, or even five seconds, exposure if an equally good result could be got instantaneously. But there are advantages accruing from the use of the stop that possibly many modern amateurs have never thought of.

One function of the stop, or rather the one supposed objection to its use—that is, of course, an unnecessarily small stop—in former days, was that it destroyed atmosphere and distance. Now, though practically, in employing a very small stop, the general tendency to want of atmosphere might be greater than when a larger aperture was regularly used, we are personally of the opinion that it was not the fault of the stop as such, but the stronger aptitude to under-expose that its use involved. Less attention was paid formerly to the accurate relation of the exposures made with different stops, and, as every one is aware, there is a very strong inducement to make a long exposure as short as possible; hence we think that, when using small stops, the want of "atmosphere" came to be set down erroneously as a necessary function of the stop instead of to an unconscious habit of under-exposure.

The landscape worker of old laid himself out to produce a picture as optically perfect as his instruments would permit, and strove to have both his foreground and distant objects, the central as well as the marginal, as well defined as possible, and to attain this end he stopped down his lens as much as the rapidity of his plates would allow him to do conveniently. The "impressionist" school have done much latterly to cast ridicule upon the idea that want of sharpness constitutes "art," or that it increases the "softness" of a picture. The idea of giving prominence to the chief object in a picture is an excellent one, but it should be carried out in other ways than by making that one object sharp, and all the rest out of focus. Again, the argument that in nature the eye only sees a small portion of the landscape distinctly (or sharp) at once is quite true; but it can see any portion sharp that it is turned to, which is more than can be said of the impressionist's work, in which, if the eye be taken off the main object, there is nothing sharp to see.

Let us, by all means, then, start with a well-defined picture, for, however microscopically sharp it may be, if the gradations of light and shade are correct, that is to say, if it has been properly lighted and exposed, the minute definition will in no case prove offensive. Where such appears to be the case, it will generally be found due really either to bad lighting, or to too harsh contrasts. We remember, many years ago, a charming picture by an amateur friend, of the Matterhorn, and the well-known Rosenlaui Valley, which would have been perfect but for such an effect. In one portion of the picture is a belt or mass of dark pine trees, and these were almost microscopically rendered, being at the same time lit by a strong side light. The result was that the extremely fine rendering of the illuminated side of the trees, sharply cut against the deep shadow, gave the trees the appearance of being cut out of paper, the result being set down to excessive sharpness, whereas, in our view, it was solely due to the exposure having been insufficient for that portion of the picture.

Now, with the best of lenses, of whatever form, it is perfectly well known that objects at widely different distances cannot be secured of equal sharpness when the full or a large aperture is employed, because the lens is then deficient in what is known as "depth of focus." Neither, under similar circumstances, will a lens of the focus intended to cover a given sized plate do so equally from centre to edge on account of the natural curvature of the field, and in both cases a stop becomes a necessity. In the latter instance, a lens of much longer focus, and capable, therefore, of covering a larger surface, may be used to get over the difficulty of curvature of image, if the subject will admit of it; but then, in the matter of depth of focus, things are worse than with a shorter-focussed lens. Wherefore we say, Use a stop, and be content with a moderate exposure.

But, from another point of view, a somewhat protracted exposure becomes an absolute advantage, notably on a windy day, paradoxical as it may appear. Here rapidity of exposure would seem to be the one essential, and certainly, if the quality of result could be obtained with an *instantaneous* exposure, nothing better could be desired. But, as we have said, drop-shutter exposures will *not* give the result, and, failing that, an exposure of half a second, or one, two, or three seconds will be far more likely to show motion of the trees than one of ten, twenty, or thirty. Look over a collection of landscapes of twenty years or more ago, more especially if taken on dry plates requiring exposures, perhaps, of half an hour, and note how very favourably the rendering of the foliage, as regards stillness, compares with much of the work of to-day executed in a second or two. Now we have too frequently to accept a fan-like blur as representing a hanging spray, or, in bad cases, a series of concentric segments of a circle will mark the line of motion of a swinging branch.

In very few portions of the country where landscape work is worth doing is a perfectly still day ever experienced, or, if it should be, it is under circumstances of light that render work impossible. The regular landscape worker knows this, and goes prepared to "dodge" the wind, selecting those moments when the foliage is still for an instant, and making his exposure in little bits. It was no uncommon thing in old dry-plate days to spend half an hour or an hour in thus eking out an actual exposure of two or three minutes. Now, failing an instantaneous exposure, a merely short one is useless, except to show that the trees were in motion when it was made. To cut up a total exposure of two or three seconds into fragments is a practical impossibility; but, if by inserting a stop the necessary time can be increased to, say, ten seconds, there is a chance, by means of manual dexterity and closely watching the foliage, to divide the time into small portions during which the wind is absent. For this purpose a simple flap shutter, worked with the thumb and finger, is more convenient than the cap, and is further useful as a sky shade.

We might enlarge to almost any extent on the desirability of using the stops instead of full aperture, but space will not permit; we have, however, said enough to warn our younger readers of the folly of going in for quick exposures instead of studying quality of result.

Photography in Natural Colours.—*Apropos* of Mr. F. E. Ives' lecture on *Photography in the Colours of Nature* at the Royal Institution next week, we understand that M. Lippmann, of Paris, will shortly announce the results of some further experiments in the direct reproductions of colours. The methods of both workers are, however, as our readers are aware, entirely dissimilar.

The "Daily Chronicle" on Process Work.—Our morning contemporary of the 4th inst. devotes a large portion of its space to a review of the month's illustrated periodicals, chiefly with regard to the methods of reproduction selected. Of many of the photo-mechanical blocks in the last *Harper* we are told that "these reproductions prove that the cheap sneers at cheap processes can henceforward only be indulged in by people who do not know what they are talking about." Of another magazine, however, it says that it thinks "it can almost dispense with the artist and substitute for him the photograph." Query, "photographer?" "That it fails lamentably in doing this is because photography is not a fine art, and therefore the reproduction of a photograph is not an artistic object." Good reviewer, there are other people who do not know what they are talking about besides those who fling cheap sneers at cheap processes.

Mineralised Methylated Spirit in Collodion Emulsion.—At the last technical meeting of the Photographic Society of Great Britain some stereoscopic collodion transparencies by Mr. Warnerke were shown, the halves being made from different emulsions coated on the same plate. The one emulsion was made with the old form of methylated spirit, the other with the mineralised compound. Mr. Warnerke claimed, and a comparison of the results seemed to support the claim, that the emulsion made with the mineralised spirit was more sensitive than the other, without any disadvantages to set against this gain. The images, however, were, as was pointed out at the meeting, decidedly foggy—too foggy, in fact, for lantern-slide work. On the whole, however, the new methylated spirit, from this and other evidence, does not appear to have the deleterious effect in collodion emulsion work that was anticipated. Of its effect in gelatine emulsion making we are without any data.

The Society's Meetings.—The lecture on *Photogravure* which is to be delivered by Mr. A. W. Dawson at the Photographic Society of Great Britain on May 17 is an "extra night," that is to say, the meeting will be in addition to the technical and ordinary meetings which are held every month. We do not doubt that, to employ the trite phrase, the lecture and its illustrative examples will be very interesting, and we hope a good attendance will result. But our hope is unaccompanied by a feeling of confidence in its realisation. The attendances at the Society's special lectures earlier in the year were ridiculously small, and at the technical meeting on the 26th ult. the amazing number of nine members climbed up those awful stairs in Great Russell-street. What is the cause of this apathy among the members? A suburban Society, the North Middlesex, frequently has an attendance of from forty to fifty; the London and Provincial invariably makes a good muster; and the Photographic Society of Great Britain—the "Parent" Society—never!

Speed of Plates.—Dr. Carter Browne, in our last issue, asks us to suggest to plate-makers the advisability of indicating on each of their boxes of plates the "speed" as applied to the actinograph of Messrs. Hurter & Driffield. We are pleased to endorse our correspondent's suggestion, the more readily as we have for years past urged makers to adopt a reliable and common method of indicating the rapidity of the plates they send out. It is well known that the sensitiveness of an emulsion, as determined by Mr. L. Warnerke's sensitometer, cannot be relied upon for comparative purposes, a circumstance which, to our knowledge, has induced many of the makers to relinquish its use. We are aware that several of them prefer to test the speed of their plates in the camera, but this is for their own information and not for that of those who use the plates. The terms makers employ for distinguishing the various rapidities of their plates are not only meaningless and misleading, but are absolutely useless for purposes of comparison both in practical and experimental work.

Action of Ammonia in Development.—In the course of his long and abstruse paper on *The Theory of Development*, which was read at the Camera Club Conference, Professor H. E. Armstrong

F.R.S., after pointing out the solubility of silver bromide in ammonia, suggests that, in developing with the aid of ammonia, the image is in part formed from silver in solution. We also gather that, in his opinion, it is due to the solvent power of ammonia that with a pyro-ammonia developer peculiar kinds of fog are produced. It is a moot point whether the ammonia really plays the part which Professor Armstrong assigns to it, and certainly, to our knowledge, it has never been demonstrated by experiment. Negative evidence, however, may be drawn from some remarks by Mr. Bothamley, in his paper read at the same Conference (see page 264, *ante*). That gentleman's experiments, made to ascertain "whether ammonia solutions of the strength commonly used in developers do really dissolve an appreciable quantity of silver bromide from a gelatino-bromide plate," proved "that the quantities dissolved were so small that it is difficult to regard them as playing any important part in the production of fog." If this was the conclusion reached after the ammonia solutions of various strengths had been allowed to act on the films for forty-eight hours, what is the likelihood of the image being partly formed of the "silver in solution?"

OBSOLETE PROCESSES.

No. 1.—The Daguerreotype.

The majority of photographers, who have only taken up the practice of the art during the last one or two decades, have very little idea of the practical details of many of the older processes. Therefore it may be desirable to describe some of those which were in general use in the earlier days, and by which excellent results were produced. It is obviously impossible, in a single article—or, indeed, in half a dozen articles, even were the space at disposal—to go into the minutiæ of the working details of the different methods, and the modifications thereof—the causes of failure, the remedies, and the like. Our object will be gained by briefly describing the processes as they were generally worked at the time of their abandonment; that is, with all the improvements up to the then date.

The Daguerreotype, as all our readers are aware, is a picture on a silvered copper plate. It is, or rather was, and we shall write in the past tense, essentially a dry process, in fact, more so than any modern one, inasmuch as the plate was not touched with water until the fixing operation. The plates were supplied ready plated with a substantial coating of silver, and with a perfectly even surface. But most of the best operators preferred to supplement the plating with a layer of *pure* silver by the electrotype process, a voltaic battery being an adjunct in every well-appointed Daguerreotype establishment.

One of the most important operations in the Daguerreotype process was that of polishing the plate. Unless this was perfectly performed, a first-class picture was an impossibility. The plate, after having its edges bent slightly backwards, so as not to cut the buffs presently to be described, was first treated with very fine tripoli and alcohol; at one time olive oil was used. It was applied on cotton wool with a circular motion. Then it was polished with dry tripoli on fresh cotton wool, this time in one direction only—usually the longest diameter of the plate. After this, it was ready for buffing.

The buffs were flat pieces of wood, about three inches wide, and twelve or fifteen inches long, with a handle at one end. Sometimes they were slightly convexed, lengthwise. The wood was first covered with one or two layers of cloth, or wash-leather, tightly strained on, and then with good cotton velvet. The plate, already polished with the tripoli, was now clamped to a holder, fixed to the table, and dusted over with the finest rouge, and then polished with one of the buffs, always in the same direction. Next it was dusted with finely powdered charcoal, or lamp-black, free from grease, and buffed again, separate buffs, of course, being kept for each of the polishing powders. Necessarily the greatest care had to be taken that not the slightest particle of grit reached the plate or the buffs, as it would produce a scratch which could only be removed by going through the whole of the operations afresh. The surface, when polished, was no longer white, but black. The finer the polish the blacker it was.

The next operation was that of rendering the surface sensitive to light. This, as a matter of course, had to be done in the dark room. The iodine and bromine box was a long, oblong wooden box, divided across the middle by a partition. Each compartment held a deep glass dish, the one for iodine, and the other for bromine or the accelerating agent. Over the pans were fitted sliding glass plates, which covered them up, so as to prevent the escape of vapours when the box was out of use. In the front of the box were a couple of small doors, fitted with looking-glass, so that the operation of sensitising could be watched as it proceeded. In one pan were placed some crystals of iodine, and on it some cotton wool. In the other was put some bromide of lime. The object of the wool was to evenly diffuse the vapour. The plate was placed in a frame something like the carrier of a dark slide, which could slide alternately over one pan or the other. It was first exposed to the iodine until it acquired a deep golden tint, as seen in the looking-glass, by the formation of iodide of silver. Then it was slid over the vessel containing the bromide, where it was allowed to remain until it became of a deep brown. Next, it was passed back again over the iodine. Here it now quickly began to assume a rose tint, when it was removed. It was then ready for exposing in the camera, and the sooner the exposure was made the better. Considerable experience was necessary in the sensitising in order to secure the plates in the best condition.

The exposure with a Petzval portrait lens, which then had an aperture of *f*-5 to *f*-4, in the studio, with a tolerably good light, was from five to thirty seconds.

The image, it need scarcely be mentioned, was latent. For its development a "mercury box" was required. That consisted of a box, mounted on legs, at the bottom of which, and protruding through it, was a small iron cistern, to contain mercury, and a thermometer, with its bulb in the cistern and the index tube outside, so that the temperature could be read without opening the box. The exposed plate was placed in the box, some distance above the mercury, at an angle of 45°, and the lid closed. A lighted spirit lamp was next placed under the cistern, and the mercury heated to from 140° to 160° Fahr. In a few minutes the fumes of the mercury caused the image to gradually make its appearance, the development being watched through a small glass window in the front of the box, by the aid of a taper. When judged to be sufficiently developed, the plate was removed. For the development it was essential that the mercury should be pure and free from oxidation. Up to this point it will be noted that the plate has not been touched by water.

The next operation was to fix the picture. This was done by first plunging the plate in a dish of water, and then immersing it in a weak solution of hyposulphite of soda, about one part of the salt to sixteen of water, until the yellow colour disappeared, as in the case of fixing modern plates. It was then well washed and finally rinsed with distilled water. Some operators used to flow a little alcohol over the developed plate prior to placing it in the water, and then the solutions took more readily to the surface. Although the picture, so far as the action of light is concerned, was fixed at this stage, there was yet another operation to be gone through, sometimes called fixing that of "gilding" the image.

This was done by placing the plate on a levelling stand, and covering it with a solution of *sel d'or*—the double salt of hyposulphite of gold and soda. It was then heated with a spirit lamp from below, when, in a minute or two, the image increased considerably in depth and brilliancy, while its permanency was greatly enhanced. Indeed, a well-gilded Daguerreotype may still be reckoned the most permanent of all silver pictures. After gilding, this was washed with distilled water and dried.

The drying of the plate was not an unimportant matter, for, unless it was carefully done, the beauty of the picture might be greatly marred; the mode was this. After well rinsing with distilled water—ordinary water would produce markings—the plate was held in a pair of pliers and drained from one corner, while the gentle heat from a spirit lamp was applied to the opposite one. The plate was then slowly raised without altering its position, so that the evaporation proceeded regularly. If the drying, when once commenced, were arrested, a mark would be produced on the image that was exceedingly difficult to get rid of.

CONTINENTAL NOTES AND NEWS.

Fixing Negatives Temporarily.—For this object, M. H. Reeb advises that the negative, when removed from the developer, be drained (not washed), plunged into a two per cent. solution of tartaric acid, and left therein for from half a minute to a minute. The operation is then finished, and the negative can be exposed to diffused light with impunity, and is then washed and dried. Of course, such a method would only be of use to the photographic tourist, who might find it advantageous to defer fixing until his return home. Any developer except iron is permissible.

A Novel Reducer and Intensifier.—Herr Lainer, in the *Rundschau*, suggests a method for reducing over-dense, or clearing yellow-stained, negatives, which, however effective it may be, certainly does not err on the side of rapidity. It is to immerse the *cliché* for from six to twelve hours in a bath of soda hyposulphite strongly acidulated with sulphuric acid. We see nothing in the more expeditious processes which should induce us to desert them for this. In the same journal another gentleman recommends the intensification of thin negatives by first of all soaking the plate in water, and then immersing it in a solution of carmine. It is best to have a weak solution of the latter, as the operation can be repeated.

To Recover Gold from the Sulphocyanide Bath.—When using the sulphocyanide toning bath, says the journal quoted, the gold may be very easily recovered by adding to the used bath a small quantity of hydrochloric acid and sulphate of iron. This throws down a precipitate of metallic gold mixed with hydrated oxide of iron. The mass is dried, and the iron removed by heat.

The Fathers of Photography.—Señor Fernandez, of Barcelona, has been writing to the French photographic papers, stating that he is about to construct a large hotel and studio on the spot where the first Daguerreotypist first "took the cap off." He intends to have the portraits and names of Daguerre, Niepce, Poitevin, Boyar, Talbot, Arago, and Laborde, also views of the places where they lived, included in the decoration of the façade of the buildings, and he asks the assistance of the press in the matter. The *Revue de Photographie* suggests sculptured medallions of the heads of the fathers of photography as being more decorative and more easily understood than representations of the houses in which those *savants* resided. We endorse the advice. At the same time, if the collection is to be complete, we should like to see places found for a few more "fathers" of English birth besides Talbot, such, for example, as Herschel, Scott Archer, Ponton, and others.

Ladies at Photographic Societies.—In America, as we have from time to time reminded our readers, there are one or two camera clubs and photographic societies which receive a large share of active support from the members of the fair sex. In this country, on the other hand, ladies take little or no part in society life, excluding, of course, lantern nights and suchlike gatherings, which do not count. Things are about the same, from all we can gather, on the Continent. We extract the following line from the proceedings of a recent meeting of the Société Génevoise de Photographie: "The ladies, who had been specially invited to this meeting, were conspicuous by their absence." Perhaps it was wet, perhaps there were counter attractions; perhaps, again, the ladies knew what was on the agenda, "saw the snare, and then retired." Analogies between the eye and the camera: orthochromatic plates and hand cameras, are not a safe draw for the ladies, gentlemen of the Société Génevoise de Photographie.

A Cry of Alarm.—*La Tribune Photographique* publishes an article under this heading in which it makes an endeavour to rescue the stand camera from the cold shade of neglect among amateurs, into which the rage for hand cameras is undoubtedly driving it. "There are," it says, "certain kinds of objects to which we refuse to assign the name of apparatus, and that are brought before raw amateurs as supplying, for a few francs, the very latest advances in cabinet work, optics, and, of course, cheapness." It is against this kind of thing (*i.e.*, the hand camera) that our contemporary utters its "cry," expressing its preference, nay, even its tender regard, for the good ordinary camera, mounted on its tripod, with its double slides, its battery of lenses, its focussing cloth, &c. It is a little heavy, says the *Tribune*, pleadingly, a little cumbersome, nay, it is sometimes troublesome on an outing, but it has its (the *Tribune's*) preference for, all that, and why? Because—well, because, in brief, the ordinary camera allows of results being obtained which are denied to the hand camera. Has the *Tribune*, to quote Mr. Cimabue Brown jun., "been subsidised to write down hand cameras?"

Panoramic Lantern Slides.—In March last, at the Conservatoire des Arts et Métiers, Commandant Moessard lectured on panoramic photography, and showed his audience the effects of panoramic perspective on the screen. The latter was semi-cylindrical, eight metres wide and two and a half metres high, the linen being stretched on a frame having the shape of a part of a cylinder of six metres radius. At a point corresponding with the centre of an imaginary circle, of which the screen formed a part, were placed four lanterns, each projecting a portion of a panorama. The most difficult part of the operation was to join the four views exactly, so as to make a continuous panorama; but this was overcome by each view showing at its edges a part of the next view to a width of two or three millimetres, the views being marked so as to make them coincide at the proper places, the illumination of the junctions being levelled up to that of the remainder of the picture by screens in front and at the sides of the lime.

Orthochromatic Plates for Stellar Work.—In the *Annuaire* for 1892 (a French astronomical publication) there is a note, signed by Messrs. Paul and Prosper Henry and Messrs. Plummer and Scheiner, stating that the commission which has examined certain stellar photographs on isochromatic plates finds that such plates are unsuitable for obtaining negatives for the chart of the heavens, the stellar discs being surrounded by a strong aureole, due to the chromatic aberration of the red rays caused by the lens. With the smaller stars this aureole is less intense, but with stars of mean magnitude it is quite dark, and thus increases the diameter of the stars. It is therefore impossible, the note proceeds, to estimate the stellar magnitude on these plates. To this note M. Léon Vidal appends some observations expressive of the difficulty of accepting the conclusions come to. He points out that there is no *à priori* reason why orthochromatic plates should be rejected for the work of mapping the heavens, and also says he thinks them the only plates suitable. Competent specialists should have been consulted by the Committee. But we should like to ask the Messrs. Henry whether non-orthochromatised plates would be insensible to "aureoles produced by the chromatic aberration of a lens?"

COLLODION EMULSION NOTES.

THERE are one or two points in connexion with Mr. Alexander Mackie's paper on *Collodion Emulsion* before the London and Provincial Photographic Association on which I should like to say a word. First, with regard to the use of bromide of ammonium, I quite agree with Mr. Mackie in preferring that salt to any other where circumstances admit of its use, although, as he says, I have recommended the double salt of cadmium and ammonium. As far back as 1865, and for some years later, ammonium was my sole bromide; but, as the emulsion process became modernised, and special makes of pyroxyline were introduced, it ceased to answer as perfectly as heretofore. With a good-bodied and somewhat horny cotton, made at a moderately low temperature, it is all that could be desired; but when it comes to "high-temperature" and other "fancy" samples, it requires to be tried first, and it may or may not answer.

Another reason for giving it up, or, rather, for recommending the double salt, was the far greater solubility of the latter. Without using water, it is only possible to get something like five grains to

the ounce of ammonium bromide into solution, and here again, with many of the modern cottons, this is not sufficient. The use of water is not altogether objectionable, but it is to be avoided as much as possible, for what with that contained in the solvents, and used in dissolving the silver and bromide, the emulsion becomes pretty well loaded at the finish. This is not a matter of so much importance in the case of a washed emulsion, or one that is to be washed, because in drying the excess is got rid of, and the pellicle can be redissolved in strong solventa. But, in the case of an unwashed emulsion, every drop of water is of importance as adding to, or causing, crapiness, mottling, and a host of troubles. Its presence, too, in a great quantity has a detrimental effect on the fineness of the suspended bromide.

Turning to Mr. Haddon's suggestion *re* precipitation, that is no doubt the ideal method of washing out the soluble salts, if only it could be relied upon. That, however, after a very long experience, I am compelled to say is not the case. Very few samples of pyroxyline will bear precipitation at all without losing all the vigour that the unwashed emulsion possessed, and some even separate from the bromide. Even those that are amenable to precipitation are not to be relied upon invariably, as without any apparent reason they will fail to precipitate satisfactorily. I have tried large and small proportions of water, hot and cold, pouring the emulsion into the water and the water into the emulsion, in fact, have rung the changes pretty effectually in my endeavours to arrive at a reliable precipitation method, but I have to confess I have not succeeded.

Curiously enough, at first sight, the form of pyroxyline that stands precipitation best is that which has been already once dissolved and precipitated, as in the process published by Chardon, to which allusion was made at the meeting. In this process, which, as old collodion emulsion workers will remember, took the prize offered by the French Photographic Society for the best dry process some fifteen years ago, M. Charden made use of two kinds of precipitated cotton, which he named "*coton résistant*" and "*coton pulvérulent*," and which were thrown down from their solution in ether and alcohol by cold and hot water respectively. The two products were supposed to possess different properties, but beyond a slight difference in appearance and of solubility—the latter of the two being bulkier and more soluble than the other—I could never detect any great distinction between them, nor, with the exception I have named—they stood re-precipitation better—any advantage over ordinary cotton.

The most remarkable features about this precipitated cotton are its great solubility, and the fact that it frequently weighs as much as, or more than, the original cotton dissolved, in spite of unavoidable losses both in dissolving and precipitating. With regard to the solubility, I have known a sample of pyroxyline, that gave a scarcely usable collodion with eight or ten grains to the ounce of solvents, to show a solubility after precipitation to the extent of seventy or eighty grains, and still give a perfectly fluid and fluent collodion. In fact, there seemed to be practically no limit to its solubility. The increase in weight was, no doubt, attributable to a change of condition of the cotton by precipitation, a change somewhat of the nature of, if not exactly so, a direct hydration of the nitro-cellulose, a reaction that wae stated to take place, by one of the earlier French experimentalista—Blondeau, I think—by the precipitation of dissolved gun-cotton.

Other experimentalists in the action of water upon collodion and pyroxyline, including Hardwich, have shown that a portion of the cotton remains soluble in water, and therefore there should be a decided loss of weight in precipitation. Whether any portion is soluble in water alone I am unable to say from personal experience, but that a very considerable quantity of matter is removed by precipitation may be easily demonstrated. If a quantity of collodion or of emulsion be poured in a fine stream into a moderate volume of water, and well stirred until the flocculent and pulverulent portions of the precipitate have separated, and the clear liquid be then poured off and set aside for a while, it will be found, in the course of an hour or two, to have become semi-solid or gelatinous, or a thin jelly will have separated from the rest of the liquid, according to the volume of water used and other circumstances. From the interval that elapses between precipitation and the gelatinising of the liquid, it seems to me clear that it is the *diluted solvents* that retain a portion of the pyroxyline in solution, and that, as the more volatile portions of the residual liquor evaporate, the solid matter gelatinises, owing to its insolubility in water alone or very dilute alcohol.

I mention these changes and phenomena in order to explain the utter unreliability of the method of washing emulsions by precipitation. When such important changes take place as the chemical absorption of water and the elimination of a considerable portion of the original pyroxyline, the latter is necessarily converted into an entirely different substance from that which is obtained by driving off the solventa by evaporation before treating the residue with water. If I add to this the no less important matter of the possible removal, along with the soluble portion of the pyroxyline, of valuable organic constituents of the emulsion, I think no more need be said against the adoption of precipitation, no matter how *convenient* the method may seem.

As a matter of fact, scarcely any two emulsions behave in identically the same manner, even when precipitated under precisely the same conditions as far as can be secured. One will sink to the bottom in heavy clots, another will float to the surface in large flocculent tufts, or will aggregate into a frothy or pasty scum which, after a while, solidifies into a solid cake; and, lastly, it is a very common occurrence to have the precipitate—or rather, product—divided into two distinct portions—one a flocculent, "cottony" mass that floats, the other a heavy, sandy deposit that settles to the bottom, and which dries into a soft, coarse powder. In this instance it would seem as if the emulsion had divided itself into two distinct portions, one of which contained a surplus proportion of cotton, the other an excess of silver bromide, and that their characters would be entirely different. But I have dissolved the respective products in such cases separately, and compared them, without being able to detect the slightest difference, either physically or photographically, and whatever qualities were possessed by either—usually inferior—the other shared them equally. *(To be continued.)* W. B. Bolton.

WHY PHOTOGRAPHS FADE.

IV.

We now come to the subject which is still to most photographers and to professional ones most certainly, of the greatest importance, that of the deterioration of their albumenised silver prints. Any one who has gone into this matter will agree with me that, whichever way one turns, one meets with most strange results, that seem to baffle all explanation, or, at least, appear to be governed by no fixed law. One finds, perhaps, that some waste print, which has been little more than rinsed after coming out of the hypo bath, stands tests that bring a print on which every care had been expended to grief. On going into this subject I soon found that the only way would be to go right from the beginning, inquire into every stage of the preparation of the paper, and every detail of manipulation, &c., during the production of the prints, and then endeavour to find out where the mysterious, though, as we know by results, most important, details of manipulation are which cause the fading of our prints. One may use the one sample of paper, tone and fix in the same strength baths, for the same length of time, wash the prints under similar conditions, as far as we know, and yet some, after twenty years, will be found, practically speaking, unchanged; others, after a year or two, will be found to begin to be going all wrong.

During my experiments I have most certainly come across many things which appear to explain nearly all of the causes of the deterioration of our prints; and if, by stating the various points I have found out, I can give a clue to the other workers, or, what would be even better, if we could get some Photographic Society, whose members have more time, and have better opportunities to conduct an exhaustive inquiry into a subject of this kind than I have, I shall feel very pleased, because I am quite certain of one thing, and that is, that the photographic printing process of the future must be a printing-out one—that the lightest tints in the picture must be seen, so as to get just the depth of tint required, and that the weak points in a negative may be dodged with certainty.

Platemakers and others may advertise and talk nonsense for ever about isochromatic or other wonderful plates, and the operators may be as skilful as possible, but as long as a lens will take everything in a landscape that is before it, with the uncontrollable amount of light and shade, success will depend upon the skill and artistic taste of the man who produces the print. I do not believe that there is one

in a hundred landscape negatives that the best possible result can be got from, without a certain amount of so-called dodging on the part of the printer; and, to be able to do this, and prevent a most serious waste, he must be able to see what he is doing.

If amateurs would only take one-half the care in printing that they do in the production of their negatives, they would find their average work very different. The only things many seem to trouble about are the make of the plate, and the formulæ for development.

But to return to the question of fading. If we carefully examine a collection of good old albumen prints, we shall find that there has been a yellowing of the white parts of the prints, and possibly a slight reduction of the density of the image; to an extent, the latter will be more apparent than real, due to the loss of brightness in the high lights, so that the initial cause of the deterioration of the prints will be found to be due to the sickly yellow look of the parts which should be white. This must be due to one of three primary causes. Either the paper itself yellows from exposure to minute traces of sulphuretted hydrogen in the atmosphere, or the fixing bath of hyposulphite of soda does not dissolve a compound of albumen and silver in the film, which compound is changed into the yellow form of sulphide of silver in time by the action of the sulphuretted hydrogen, or the hyposulphite of silver dissolved in the excess of hyposulphite of soda is not entirely washed out of the film, this hyposulphite of silver being in time converted into sulphide of silver.

We will go into these causes separately. In all my tests I have never been able to trace the yellowing to the paper itself. I once tried coating papers with albumen, gelatine, arrowroot, &c., without any silver, but I soon found that it would give me no ground to go upon, because with the vehicles used would have to be first formed the organic silver compounds that are formed in our printing papers before they could be exposed to any conclusive tests. Besides, there is no doubt that the faded, yellow look of an old albumen print is due to the presence of minute traces of silver left in the film, and afterwards converted into a sulphide of that metal by the atmosphere.

We have to find out, then, what causes the silver to be left in the film, and what are the contributory details of manipulation which produce the deterioration of prints more rapidly in some cases than in others. It is of no use to say that a print has not been properly fixed, or that the hypo has not been perfectly washed out. What one wants to know is the reason *why* these manipulations are not carried out as perfectly at one time as at another.

With the old plain, salted paper prints, properly fixed and washed, the silver seemed to be easily and entirely removed from the high lights of the pictures, but with albumen prints I have never found any which would not, when tested, show more or less the presence of yellow sulphide of silver in the light parts. Some one may say that is easily explained—viz., because silver does not form a definite compound with gelatine as it does with albumen; but I have proved that this is not by far the only explanation. There is no doubt that in fixing a print a great deal depends upon the physical condition of the vehicle used. We see exactly the same thing in other photographic work. For instance, I can make two silver bromide emulsions, containing exactly the same quantities of silver and gelatine on each plate, and yet, on development, one can be developed so dense as to be useless for practical purposes; with the other, do what one will, it would only show the ghost of an image.

We get similar results in toning. The old plain, salted papers could be toned with an old toning bath, after the gold had been almost all used up by toning albumen prints first, and yet many of the modern chloride emulsion papers can only be toned by a very strong sulphocyanide toning bath; in the former case the reduced chloride of silver is on the gelatine (so to speak), in the latter it is in the film.

Old wet-plate workers will know what I mean by the physical conditions of a film controlling the results by reference to the sensitising of a collodion plate. The glass coated with collodion, and put into the silver bath as soon as it had set, would give a good creamy film of iodide and bromide of silver. But if the ether and alcohol were allowed to evaporate, and the film to dry before putting it into the silver bath, we would not obtain the same perfect formation of the silver haloids, because the hardening of the collodion had bound up the bromide and iodide of cadmium, &c., in the film, and the affinity of the silver for those salts would not be strong enough to destroy the physical protecting power that the collodion has over the soluble haloids in the film.

HERBERT S. STARNES.

COLOUR IN THE CAMERA.

[*Philadelphia Record.*]

THE first public lecture illustrated with specimens of coloured photography was recently given at Association Hall, under the auspices of the Photographic Society of Philadelphia. Scientific demonstrations of the Ives process have been previously made at the Franklin Institute, but these were purely of a scientific nature. The hall was filled to the roof by an enthusiastic audience, and every view in colours was received with applause that brought blushes of pride to the cheeks of F. E. Ives, the pioneer of coloured photography, who worked the stereoptican end of the lecture from the balcony.

"From Philadelphia to the Grand Canon of the Yellowstone National Park" was the subject chosen for the lecture. Mr. Ives furnished the coloured photographs, while Mr. W. N. Jennings furnished the plain photographs and delivered the lecture. In his introductory remarks, the latter paid a graceful tribute to his co-labourer. "When, about thirteen years ago," he said, "Mr. Ives undertook to reproduce, by means of photography, the colours of nature, he fully realised that no light task was before him. Year after year he kept steadily at work, determined to win the battle, till at last success crowned his efforts."

The first few views were from plain photographs, but when the first coloured photograph was projected the audience gazed spellbound. For a moment there was a dead silence. Then, as one man, the large audience burst into applause that lasted for several minutes. From that moment the success of the lecture was assured.

NO BRUSH EQUAL TO THE MAGIC LENS.

When thrown upon the canvas, the coloured photograph is a perfect miniature of nature. No oil painting could possibly produce even an approach to the effect caught in the magic lens of the colour camera. The delicate cloud effects, the various tints of foliage and water, the different colours in the rocks, all are perfect. The view of McCartney's cabin, the first hotel established in the Park, is a thorough test. The many gradations of colour in the landscape are brought out perfectly. Where the logs of the cabin have been exposed to the weather, they have become bleached, while those in the shelter of the overhanging eaves still retain their natural orange-brown colour. The grass in the foreground suffers from a lack of moisture; while that in the rear of the cabin, fed by a mountain stream, is a bright, fresh green. Another shade of green is visible in the window blinds, and still another in the dark pines on the hillside. The dark indigo blue of the sky stands out in bold relief. All the colours of the original landscape, and its finest gradation of light and shade, are here most faithfully reproduced.

Mr. Jennings' lecture was delivered throughout in a delightfully chatty vein, interspersed with wit and anecdotes of no mean quality. His own plain photographs—many of which were character sketches—added much to the charm of the entertainment; but, as he himself admitted, the crowning feature was the perfection of Mr. Ives' experiments with the colour camera. The Yellowstone Park was chosen because of its variety of colour. The scene from Jupiter's Terrace is full of it. In the foreground is a small pool. In the centre, the water is almost boiling, from which radiate delicate bluish-green silken threads, gradually running through the scale of colour, until at the edge of the pool it assumes a deep purple. The cliffs of Golden Gate afford an excellent opportunity for the reproduction of colour in rocks.

"Even the most prominent impressionist," said the lecturer, "wrings his hands in despair as he gazes upon this marvellous mosaic, and frankly confesses that brush and pigment in the hands of the most skilled artisan fall far short of doing justice to this masterpiece of nature."

MR. IVES' PROCESS.

Mr. Ives has patented his process, which he thus describes technically: "By means of a very ingenious compound camera front, three photographic negatives of the object are made by simultaneous and equal exposure, from the same point of view, and upon the same sensitive plate. The photographic plate is sensitive to all colours of light, but, by introducing light filters, one of the negatives is made by such light rays only as excite the fundamental red sensation, and in due proportion; another by light rays as they excite the fundamental green sensation, and another by light rays as they excite the fundamental blue-violet sensation.

"From this triple negative a triple lantern slide is made, which, although it shows no colour, contains such a graphic record of the natural colours that, in order to reproduce them to the eye, it is sufficient to superpose the three images, one with red light, one with green, and one with blue-violet. This is accomplished either in Mr. Ives' new heliochromoscope, a device about the size of a hand stereoscope, and used in much the same way, or by projection with a special optical lantern having three optical systems, with red, green, and blue glasses.

"The process is as scientifically accurate for reproduction in colour as ordinary photography is for reproductions in monochrome, but at present can be carried out successfully only by a scientific expert, employing the spectrograph for testing the sensitive plates, and adjusting the selective colour screens. When such preliminary adjustments have been correctly made, the process is almost as simple and reliable as the ordinary negative process. By a modification of the process, introducing further complication, colour prints are made on glass or paper, but the comparative simplicity of the plan of superposing images commends it to scientists, and is more convincing to the general public."

THE CAMERA AND THE CONVENTION; OR, PICTURESQUE SCOTLAND AND PHOTOGRAPHY.

I.

Since the Convention of the United Kingdom is to be held in "Bonnie Scotland" this year, we think there could not be a more fitting opportunity for giving a few outline sketches of "where to go with the camera" in and around the vicinity of Edinburgh, the place of meeting, and to point out some spots which, being of special historical interest, possess at the same time pictorial interest, a combination that is not always to be met with.

The month in which the Convention meeting is held, viz., July, is propitious for a holiday, and many of our readers may be induced to stay a much longer time than the *Conventional* week in the land of the mountain and the flood, so that an extended field of observation, which we mean to make, may be of interest to them.

Necessarily, a good deal of hurry is needed to overtake the days' outings at the Convention trip gatherings from a not unnatural desire to go over as much ground and take as many pictures as possible in the time, but we have found this in some cases to be a considerable disadvantage. Take, for example, one of the Bath Convention outings, "Glastonbury and Wells;" certainly either of the places was sufficient to supply ample material for quite a wealth of pictures for one *day*, and, in our opinion, hurrying to both to some extent spoiled both.

To avoid this, a general knowledge of the varied places of interest, obtained beforehand, must be of benefit to those anticipating the pleasure of going to the meeting, and, when too much is crowded into one day to suit their convenience or taste, the part that commends itself can be chosen, and the hurry obviated.

The following outlines are given quite outside of any knowledge of the places chosen or trips contemplated by the Convention Executive, a list of which has not been yet issued when we write this; but we are sure that most, if not all, the points will be embraced in our notes upon the subject.

Edinburgh.

The place chosen for the Convention meeting of this year is a most charming one, both historically and pictorially. Edinburgh stands out as a city of cities from its many natural advantages, which lend to it panoramic effects and beauties not to be surpassed anywhere, and from an historical standpoint it teems with interest. Looking at it from a *cameramic* point of view, it would take far longer than the week to do it anything like justice. The various points of view—and interesting bits to photograph from the Princes-street Gardens alone—would, if produced, themselves fill a book, in the midst of which the Castle—ever imposing—towers above all, guarding the city.

With regard to the Castle there is a good story told about a poor tailor who had "whipped the cat" from Edinburgh as far as London, and, after many vicissitudes, returned home by boat to Leith, and walking up from Leith, turning the corner of Leith-street at the Register House, the Castle, towering away in the west, burst upon his view, and the poor man dropped upon his knees, exclaiming, as the tears ran down his cheeks, "Oh, my bonnie Castle! oh, my bonnie Castle! I hae never seen such a winsome sicht since I left ye." And we fancy a feeling akin to this must come to many people when the first glimpse of this scene meets their view on a return visit to the city, no matter how often they have been there. We must confess to experiencing a thrill of pleasure akin to the old tailor's every time we visit Edinburgh; the panorama spreading itself out before us as we walk up from the Waverley station is ever charming and ever new.

Views from Calton Hill.

A general view of the city is best obtained from the Calton Hill, but it is only at certain times that this can be got. The professional photographer has sometimes to wait day and days to get a clear picture of this view, the haze and smoke in the sunny distance preventing the further west parts, such as the Castle, from being successfully rendered.

Should the wind chance to be in the right quarter, however, and the distance clear, this subject makes a beautiful panoramic picture, embracing Princes-street, Scott's Monument, National Galleries, and the Castle in the distance, producing a truthful rendering of one of the impressions of the place that lives with us always.

The gaol, which stands immediately under the Calton Hill on the south—which, by the way, looks more like a castle than a gaol—makes a good picture from the railway or North Bridge side, bringing in the Calton Hill and its monuments as a background.

On the Calton Hill itself there are some bits of interest, such as the National Monument, which stands a ruin, and more picturesque, probably, in this state than if it had been completed. The original intention was to produce a building like the Parthenon, in memory of the heroes of Waterloo; but subscriptions failed, and so it stands unfinished. There is Dugald Stewart's and other monuments, but the Calton Hill boasts more of interesting things, rather than any that could be termed pictorial, unless you turn to the view that you get from its height. North, stretching away across the Forth to Fife; west, away beyond the Corstorphine Hills; east, as far as the Isle of Man; and south, where stands Arthur Seat, with all the country beyond; with the High School and Burns' monument lying in the near distance, under the shadow of the hill.

This circular panorama will well repay a visit, although, from a photographic point of view, the general effects are too mappy, and there is nothing of sufficient prominence in the foreground to help out a picture.

The Old Town.

Leaving the Calton Hill, and coming along Waterloo-place to Princes-street, the part of the general view that attracts us most is the back of the buildings of the old town west of the North Bridge, towering up ten or twelve stories high, on the other side of the valley, in which the railway and East Princes Gardens lie.

This has always been a favourite picture of old Edinburgh to and from East Princes Gardens. From the hotel windows in Princes-street the best positions for picture-making will be found.

Here you have also Sir Walter Scott's monument, which well repays a few plates.

Between the Gardens east and west is the Mound, on which site stands the Antiquarian Museum and National Gallery of Painting. These compose well for a picture with the Castle in the background. The Castle itself can be had from many points, both in the east and west gardens; also another picture of the Castle can be had from the Grass Market side, down by the King's Stables; this view shows its great height, hence more interesting than pictorial. Along the whole line of Princes-street the choice of subject is very varied, and the ease with which good positions can be obtained for getting in the desired subject and effect is light work compared with most cities we have visited—all round, it is so free and open.

Holyrood Palace.

The older and more historical part of Edinburgh naturally begins at Holyrood Palace.

Year by year the old landmarks are being obliterated, and places of historical interest are being pulled down, and carted away to oblivion, leaving nothing but the ground on which they stood to mark the places where history was made.

As an instance of how these relics of the past gradually disappear and are forgotten, we once went to photograph an old archway down the Canongate. This archway formed the entrance to the house where Darnley slept the night before his marriage with Mary Queen of Scots. When we reached the spot, the archway was all gone, and in its place were erected two square sandstone pillars. We went into the building, and there, on the ground (for the house now there is more modern) where Royalty used to revel, we found workmen toiling for their daily bread.

The Palace of Holyrood, however, still stands in all its sombre grandeur, and, this being a centre of great historical interest, pictures of the chapel and its surroundings will be desired by all.

The Chapel Royal, a ruin within the palace grounds, should be photographed, and there is an old building to the left of the palace, and nearer Abbey Hill, named Queen Mary's Bath-room, which makes a good study.

The Canongate.

Coming up the Canongate from Holyrood, about half way up on the right-hand side, is the Canongate Tolbooth, a good specimen of the French style of architecture, and in the Canongate churchyard (which is a little lower down) Ferguson's tombstone, erected by Burns, will be found; Adam Smith, the author of the *Wealth of Nations*, is also interred here. All the way up the Canongate and High-street, every here and there will be found quaint old blocks of buildings, with half-obliterated coats of arms and inscriptions, set in the doorways or on the fronts of the houses. New streets and city improvements are fast sweeping away many of these relics that delight the hearts of the antiquary and enthusiast; but there are still a few left for the photographer who takes delight in such subjects. John Knox's house on the same side of street, and St. Giles' Church higher up on the other side, are both good subjects for the camera. The buildings that form the square round St. Giles are the Parliament House, now used as the Supreme Courts, and the Advocates' Library, &c.

At the top of the Castle Hill, in a lane to the right, will be found Allan Ramsay's house (the author of *The Gentle Shepherd*). Then we

come to the Castle Esplanade and Castle interior. The view from the Castle is very charming, but, as can be well understood, photographs of the Castle, houses, squares, and rooms, are valuable principally for their historical interest.

Old Buildings and Monuments.

In the closes which run from the High-street to the Cowgate many remnants of old buildings remain, full of history and interest, which would well repay a prowl round for three or four hours.

To those who take an interest in monuments, memorials, and old gravestones, they will find quite a wealth of subject in the old Greyfriars Churchyard.

The buildings in Edinburgh of a public nature, such as banks, hospitals, and other institutions, are very numerous and very handsome, and will doubtless commend themselves to the exposure of many plates.

Arthur's Seat of itself does not make much of a picture, but St. Anthony's Chapel over St. Margaret's Loch is a pretty little bit, and beyond the Arthur-street entrance to the park is the Laird of Dumbiedyke's house.

Some spots of interest specially connected with Sir Walter Scott's *Heart of Midlothian* are situated in the Queen's Park, such as the site of Jeanie Deans' house, and the cairn where Jeanie Deans met Robertson is still shown close to the Peirshill Barrack entrance, but from a photographic point of view it is useless.

RATIO OF GRADATION.

Our letter in reply to Mr. Channon, which you were good enough to publish in your issue of April 22, was not altogether superfluous after all, since, in his last article, Mr. Channon makes no further reference to any of the previous questions of the controversy; there is no mention of Plener's formula nor of the "law of error." Mr. Channon has all at once plunged into a new question as to which of the two formulæ proposed by ourselves most accurately represents the action of light upon the sensitive film.

Our approximate formula appeals to Mr. Channon's sympathies for the same reason as did Plener's formula, namely, that he is able to support it by what appears to be clear mathematical reasoning, which, however, again involves assumptions as to the properties of plates and of the light, which are directly opposed to experimental facts.

Whatever fault may, in the future, be found with our research, there is one fact which we have established with great certainty, namely, that there is not now a photographic plate in the market to which the formula advocated by Mr. Channon applies in any other sense than as a rough approximation. We are equally certain that there is not at present a plate to be found for which the formula we have termed the "correct formula" does not fairly represent the variations in the density after development due to changes in the exposure. The last paragraph of our original paper shows how far we ourselves understood this formula as final.

In the absence of any experimental proof on Mr. Channon's part that the straight line represented by our approximate formula more aptly delineates the action of the light upon the sensitive plate than the curve with point of inflexion, of which the "correct formula" is the equation, we do not feel it necessary to minutely criticise Mr. Channon's reasoning, which leads to anything but a truthful rendering of the facts.

It may, however, be well to correct a few misunderstandings of our meaning which have inadvertently crept into Mr. Channon's article.

Mr. Channon states that we considered the whole of the light absorbed by silver bromide as effective, or that, at any rate, we had made no reference to any possible change into heat. If he will again examine our definition of the symbols used, he will find that this statement is a mistake.

Mr. Channon's second misunderstanding is with regard to the symbol dx used by us. To him, as a photographer, with the microscopic picture of the developed plate in his mind, the symbol is indefinite, because he seems to associate it with the finite particle he sees. To Mr. Channon, as a mathematician, the symbol is, we feel certain, perfectly defined by what is implied in the whole treatment of the subject—namely, $\int_0^a dx = a$. We should say that the particles represented by dx are magnitudes of the order of molecules, and have nothing whatever to do with Mr. Channon's visible particles. If he will carefully consider the length of time dt, the difficulties of the subject due to the indefiniteness of the symbols will vanish.

Mr. Channon, from his unproved point of view that no light capable of affecting the plate will escape at the back, finds it difficult to see what the loss of light at the back has to do with the densities produced on the plate. If he were to spend in the laboratory a portion of the time which he devotes to the writing-table, and to supplement his reasoning with an experiment on the lines of the following, made by ourselves, he would derive considerable assistance.

1. Behind a slow plate another plate of the same kind was placed, and several different exposures were given. Both plates were developed together, and the resulting densities were found to be as follows:—

Front plate	·535	·785	1·035	1·286
Back plate	·030	·100	·230	·370

2. In front of an Ilford extra rapid plate a strip of a slow plate was placed, and also a strip of opal glass of apparently the same opacity as the slow plate. A third portion of the Ilford plate was left uncovered. Four different exposures were given of 15, 30, 60, and 120 seconds, respectively. The densities which resulted after development were as follows:—

Densities on Ilford.	15″	30″	60″	120″
Exposed directly to light ...	1·520	1·700	1·90	2·14
Behind opal glass	1·11	1·39	1·62	1·88
Behind slow plate	0·92	1·26	1·57	1·82
Densities on slow plate ...	0·93	1·46	1·89	2·20

These experiments clearly demonstrate that the energy at the back of the plate is not a negligible quantity, and that it acts behind a sensitive plate in the same manner as behind an opal glass in which no chemical change takes place.

Quantitative experiments like these constitute whatever real value our research may possess. The theories and opinions therein are valuable only in so far as they suggest new experiments and help to connect isolated facts, or to apply in practice the results of the experiments. It is the production of more of these quantitative experimental facts which at present occupies such time as we have at our disposal.

F. Hunter.
V. C. Driffield.

BROMIDE ENLARGING.

[Newcastle-on-Tyne and Northern Counties Photographic Association.]

I need hardly dwell upon the advantages of enlarging, so as to be able to make large prints from small negatives. Few words are necessary to convince any one of the value of being able to make pictures suitable for hanging from negatives which can be taken in a very small camera, whilst the taking of such direct from large negatives requires a camera which many of us cannot afford, besides which the extra labour in carrying a 15 × 12 camera and slides about the country necessitates an amount of work which not only many of us would not care to undertake, but which in many cases is almost impossible. Besides, amateurs, at any rate, don't want large prints by the score, but, as a rule, like to have a few prints from their best negatives of such a size that they can be seen without a magnifying-glass, and it is to them that my remarks will be specially directed.

A great deal has been said about enlargements as compared with direct prints; but although I do not approve of "fuzzy" prints of any kind, I decidedly prefer a good enlargement of any size above 12 × 10 to a contact print of the same size, and from a negative taken direct in the camera.

A good enlargement of, say, three or four diameters, which need not be overstrained, has a softness in it which gives it a charm not possessed by a direct print of the same size.

Very fine definition is not required in pictures of 15 × 12 or over, as in the small sizes, because when we look at a 15 × 12 picture we usually stand a few feet away so as to see the whole picture, whilst in looking at smaller pictures we view them much nearer, and finer definition is then desired.

As it would be impossible for me to-night to go through and describe all the processes of enlarging which most of you already know, I will confine myself to giving you some of the results of my own experience, hoping it may prove of use to any who wish to try this branch of photography for themselves.

The Negative.

With regard to the negatives, I usually take quarter plates, as I find that they can easily be enlarged to 15 × 12, which is almost four diameters, without in any way overstraining, so as to cause "fuzziness," and, as that is generally large enough for most amateurs, I think quarter-plate negatives have many advantages.

Of course, half-plates or whole-plates can be as easily enlarged as

quarter-plates when daylight is used, but when artificial light is used and a condenser is necessary, then quarter plates are more easily dealt with, as the expense of condensers for larger sizes is a serious item.

After all, a half, or even a whole-plate, is a small picture, and is more suitable for an album, and if we take negatives for the purpose of enlarging, we might just as well enlarge a quarter-plate as a half-plate. There is a slight objection to the use of quarter-plates, and that is when we enlarge them up to, say, 15×12 from a negative taken with an ordinary focus lens, the perspective is rendered incorrect; for instance distant objects appear nearer than what they are in nature; but in picture-making this is, as often as not, an improvement, whilst, when they are not so much enlarged as, for instance, to 10×8, which is about two diameters, they are more correct than the original. As bromide enlargements are the most commonly produced, and are in most respects the easiest, I will confine my remarks to this class.

The simplest method is, of course, to expose from the negative direct upon the bromide paper, and when this is properly done, the results are hard to beat. There are other ways, namely, to make a transparency of the size of the negative by contact, and from this make an enlarged negative. Or make an enlarged transparency, and from this make a large negative by contact, and from this print your enlargement. These latter processes are well adapted, when a large number of prints are required, as, of course, each enlargement can be printed in the printing frame, and much time saved, but if only two or three are required, there is no need to go to this extra trouble of preparing an enlarged negative, as the first process will yield results which cannot be surpassed, and it has the advantage of being simple, whilst the more processes you introduce the more difficult it is to succeed.

Negatives for enlarging should be full of detail, and not too dense and sharp to the edges. I usually take them with stop *f*-32 and develop them without much bromide in the developer, just sufficient to keep them from fogging, as they should be quite clear.

Any amount of contrast can be had in the enlargement by using sufficient bromide when developing it. It is astonishing what excellent enlargements, with plenty of contrast, can be made from negatives without much contrast, whilst negatives with great contrast are unsuitable for enlarging. The only way to treat these is to subject them to a very powerful light, as a weak light, acting for a longer time, has not the same effect. The image being on the surface of the paper, the deep shadows get blocked up before the other parts are brought out, and show no detail in the denser parts, which is not the case in a negative or lantern slide, which is viewed by transmitted light, when the detail in the denser parts is easily seen.

Another advantage in using a small stop when taking negatives for enlarging is that you get more even negatives, so that the density at the centre is not greater than that at the edges, whereas with a large stop more light strikes the centre of the plate than the edges, and consequently the density is greatest in the centre. Negatives suitable for enlarging make excellent direct bromide prints, if developed in the same way.

The Apparatus Necessary.

Either daylight or artificial light can be used. When daylight is used various means can be adopted, but I think the best and simplest way is to place the negative towards a window, and photograph it, so that to do this you must have a light-tight box of the size of the enlargement, or, in other words, a substitute for a large camera. This does not require the room to be darkened, nor to have to work in a dark room, and is, I think, a simpler method than having to block up a window, which is not always an easy thing to do, the camera taking the place of a dark room. This is best made with a large bellows, to one end of which is fixed the front for carrying the lens, and to the other end a frame is fixed, to which a dark slide can be fitted. A hinged door could be used, on which the bromide paper is pinned, but a dark slide is much to be preferred, as the paper can be shut up and carried to the dark room to be developed, whereas, if the paper is only pinned on a board, it would have to be developed in the same room, or the whole apparatus carried bodily away to avoid the light.

This apparatus can be bought very cheap already made of any size up to 15×12, and is, I think, very convenient.

A rigid box can be used instead, when the lens is inserted at one end and the other end left open, in which case an easel is made to slide in at the back for focussing, and on which the bromide paper is pinned, and a piece of cloth hung over the back of the box to exclude any extraneous light. In each case a piece of ground glass is substituted when focussing, and in the case of the rigid box a mark must be made, so that the easel can be placed in the same position. But a camera with bellows has many advantages, as it is more easily worked for focussing and can readily be made, and a dark slide for holding the paper could be bought and fitted to it. The dark slide can be had fitted with carriers for holding any size of paper, in which the paper will easily stand upright when supported at the corners, like a plate, especially if the thick paper be used; if not, it can be held between two pieces of plain glass without harm.

The best way to fix the negative for illuminating it is to fix it in the camera in which it was taken, either by having a holder to fit in the position of the ground glass, or place it in a dark slide and open both slides; then place the camera with the negative towards the light and the lens-hole pointing inwards, the lens having been removed and inserted in the larger camera.

The lens used in taking the negative answers admirably; but if a short exposure is preferred, then a portrait lens can be used.

It is better to have a long board to hold the two cameras, so that the larger one, containing the bromide paper, is at one end, and the smaller one, containing the negative, upon a small table at the other end, so that the lens-hole of the small camera will be on a level with the lens in the large camera, each of these sliding between beads at either side, so as to keep them parallel. This saves a lot of time in centering, as when once they are set, then at whatever distance they may be removed for focussing they are always centred.

The board, with the whole arrangement, can then be rested on the window sill; and a good slope should be given, as this is very desirable, and if used with artificial light, is simply placed upon a table.

The Illuminant.

When a dark room can be used, then the window is first blocked up, leaving an aperture of the size of the negative to be enlarged. The ordinary camera or an enlarging camera containing the negative is fixed up against the aperture, with the lens pointing inwards, so that no light can enter the room except that which comes through the negative. Of course, the ground glass is removed and the negative inserted in its place, and an easel for holding the bromide paper placed at the required distance from the lens. The camera must, in this instance, be able to extend to twice the distance of the focus of the lens used.

A window facing the north is to be preferred, or wait until the sun's rays do not fall direct upon the negative, as direct sunshine is not desirable. It is also better to be as high a possible, and to have an open view, so as to avoid houses opposite, as chimneys, &c., obstruct the light and often cast a shadow over the negative, which will show in the enlargement. In this case a mirror or sheet of cardboard at an angle of 45 degrees, outside the window, so as to reflect the skylight on the negative, will greatly help to overcome these difficulties.

When artificial light is used then a condenser is necessary. It is placed between the light and the negative so as to collect the light, in order to render the rays parallel, which enter it, so as to cause equal illumination of the negative. In this case the same apparatus can be used as described for daylight, so that an open light can be utilised if a large camera is used, but if not, then the light must be enclosed, and the enlargement thrown on an easel, as in the dark room arrangement. A good Argand burner answers admirably in place of the lime or electric light.

With regard to the exposure it will depend upon the nature of the light and size of stop used, and will best be found by trying on a small piece of paper first, and when the correct exposure is found for a certain size of enlargement and a certain stop used, then other exposures can be calculated by the ordinary tables of exposure, and the density of the negative taken into account. In the case of daylight, the light varies considerably, but when a correct exposure is found by experiment on a small piece of paper, allowance can be made for the weather the same as in taking negatives, and pretty accurate results obtained.

Development.

It is as well to fix upon a good developer for ordinary negatives, and try to expose to suit it, and, if a thin or flat negative is used, then a little more bromide added to the developer, so as to give contrast, and the exposure made to suit that developer, whilst a negative with great contrast should be given an exposure suitable for a developer with less bromide, so as to avoid exaggerating the contrast, so that exposure and development should be suited to each other. The exposure for artificial light will depend a great deal on the source of light used, but for daylight, and what I find is correct for this time of year (April), using stop *f*-24, at three in the afternoon, and Eastman slow paper, from quarter-plate to 10×8, as I have here to-night, I give three or four minutes, and develop with eikonogen, as follows:—

A.

Eikonogen	1 ounce.
Sulphite of soda	4 ounces.
Bromide of potassium	10 grains.
Distilled water	60 ounces.

B.

Carbonate of soda	3 ounces.
Distilled water	20 ,,

Use three parts of A, one part of B, two parts of water, and one drop of ten per cent. solution of bromide of potassium to each ounce of mixed developer.

From four to six prints may be developed in this developer in succession with ease, and the following fixing solution used after:—

Hypo	4 ounces.
Bisulphite of soda	1 ounce.
Water	20 ounces.

This fixing solution remains quite colourless if any of the developing solution should be carried into it by the prints, and prevents the possibility of any stains from the developer.

Ferrous oxalate is a very suitable developer, but is more troublesome to make and work with, having to have a clearing solution, and it has the disadvantage of becoming muddy when used with tap water by precipitating the lime, unless distilled water is used, and is, moreover, expensive.

Hydroquinone would be very suitable if it could be used with caustic soda or potash, but when these are used they are very injurious to the paper, as even a weak solution will rot the paper in a short time, so that it will not lift without falling to pieces, and if carbonate is used it is too slow. The above eikonogen developer is also excellent for plates, if used without the extra water, giving clean and brilliant negatives; but if one keeps to one developer, better results are likely to be obtained than when one is tried at one time and another at another, and the best way is, when you find a good developer, stick to it. FREDERICK PARK.

THE PRESENT POSITION OF PHOTOGRAPHY IN RELATION TO BOOK AND PERIODICAL ILLUSTRATION.

["Our Camera Club," Leytonstone, Essex.]

It is about twenty-five years ago since I heard the first whisper among wood-engravers of another Richmond in the field. For a long period engraving on wood had no rival in the production of relief blocks suitable to print with letterpress upon the ordinary printing machines, and, although this first process had nothing to do with photography, it had the merit of dispensing with the engraver on wood. I was but a boy in those days, but I shall never forget the hopeless state of alarm this simple process produced in the engraving world. It was a failure pure and simple, and to-day I believe is not used at all. This was the method. A block was made or chalk mixed with glue or some similar substance, on this a drawing was made by a material that hardened the chalk, now a brush was used to remove the chalk not affected by the material used, leaving the design in relief; this was electrotyped, and produced a block for printing purposes. It was called graphotype, and a poor, miserable thing it was, although from the talk of the promoters it was to do away with engravers altogether.

Many years passed away, and again the bogey turned up. Photographers had naturally been trying to find a cheap means of reproducing their pictures so that they could be sold after the manner of wood-engravings by tens and hundreds of thousands. Some one says there is nothing new under the sun, and some one modernised a very old process, well known among metal-engravers and colour printers, to stipple a plate of zinc or make a design upon it with a greasy substance, and eat away the untouched metal with acid, leaving the design in relief, etching being only the process reversed—that is to say, a plate of copper is coated with bitumen or some similar substance, and the design is scratched through it, exposing the bare metal, which is eaten out by the acid in which it is placed. Roughly, this is the mechanical engraving that we have to-day.

Antiquity of Wood-engraving.

It is now time I introduce photography, which had invaded the art of engraving long before process was thought of. Perhaps it would be best, so that I make myself perfectly understood, that I should sketch out what engraving on wood was before photography and process came into use. If you gentlemen respect old age, then wood-engraving will command your respect. So ancient is the art that we know wood blocks were used to stamp the bricks the Israelites made in the time of the Pharaohs. The Chinese have been engravers time out of mind, the engraver sitting on the floor with a little table over his legs to engrave upon. During the Middle Ages the art was kept alive, and splendid specimens are to be found among collections of knife work cut upon pear or similar wood. Albert Dürer and his pupils carried the art to great beauty, but it was left to an Englishman to place it in the front rank as the picture-gallery of the million. Bewick did this, and by leaps and bounds it has grown into favour. By its growth it has killed the army of splendid steel-engravers, the specimens of whose work will ever live as a monument of English talent. The great expense of the production, and the fact that it had to have a separate printing, and that a very expensive one, was fatal to it; what little chance is left for the steel engraver seems likely to die away altogether by the introduction of photogravure.

Bewick's Improvements.

The first idea in engraving by Bewick was to draw and engrave his own blocks, and boxwood was used instead of pear, gravers instead of knives; and one very important matter was that, instead of cutting the wood for the engraver, after the manner of a plank, it was cut across the grain after the manner of a salmon cutlet. The freedom this gave the engraver to cut right and left, up and down, or in circles, will be readily understood. As the art progressed, larger and larger things were attempted, and now came a difficulty. Good boxwood was only to be found, "except on rare occasions," in small sizes. Now came the skill of the wood-preparer, who managed to join two perfectly true edges by a tongue inserted in the two pieces, and glued up in a vice making one solid piece, and so things went on; but now a great awakening was to come upon the art, the idea of an illustrated newspaper came to the front, and blocks were required made in many pieces so that several workmen could at one time work upon them, the whole thing being screwed or glued together for the printer. I fear I shall tire you by this hasty relation of what engraving on wood consists of, but I deal with these particulars to enable you to understand somewhat the requirements of picture-making for our papers and books. One more step now came to the front, and that was electrotyping. As the numbers required of the printers increased, it was found necessary to have more than one machine going at the same time. Further than that, there was the danger of an accident to the wood block, it might split, it might get worn, and that after a few thousands had been printed if the wood was soft or not properly seasoned; so electrotyping just met this difficulty.

Electrotyping.

An electrotype is made as follows:—The wood block is put under pressure in a bed of wax making a mould. This has white metal run into it, which is afterwards put into a battery and a deposit of copper is thrown upon it. The result is a repeat of the wood block "if properly done." I say this, as in these cheapening days it is often shamefully scamped, and the engraver is blamed for results that are due to the electrotyper, or to the skimping price paid by his employer. By this means the wood block is not worked from at all—by "worked from" I mean printed from—but is kept in reserve should it be required.

Drawing on Wood.

Very soon after Bewick's time it was seen that, although there were talented men who could both draw and engrave their blocks, still there were men coming to the front who were engravers of a very high order, but were but poor draughtsmen, and at the same time artists were anxious to draw for engravers, and to-day, although there are a few instances of men who can both draw and engrave, in the majority of cases the drawing is by one hand, the engraving by another. Drawings were always made upon the block of wood with pencil and Indian ink, and of course, as the engraver cut away the design (turning it into a block for the printer's roller to go over it), bit by bit was lost. Now, it was here that photography came to the front. Drawing on boxwood was a technical art, and a very beautiful art it was and is. In the first place, everything has to be reversed—that is to say, the Lady Glendower signing the marriage certificate has to do so with the left hand, the design appearing in the periodical reversed; and if you gentlemen have ever painted or made a design you will know what agony it is to see it reversed in a looking-glass. This the wood artist had always to count upon, and was one of the difficulties that kept many artists outside book illustration; but now some enterprising photographer found he could photograph a drawing made upon paper, and print it upon the wood block *reversed*, the engraver having the original by his side when engraving. I remember all the miseries of these things, the thick and uneven films, films that when a man tried to cut a fine line flaked off a slice of the design, films that directly the ink roller was put over them worked up and filled up the lines with a sort of mud. In the finer parts the graver often had only cut the film, and the wood was intact. Bit by bit, however, these matters improved, but I say to-day much is to be desired, and the engraver has to watch the photographer like a cat does a mouse or he will find himself in for no end of trouble. I wish I had an audience of publishers to-night, that I might give forth the bleat of a

poor engraver, and tell them all we have suffered from photography on wood.

Now, in these days facsimile engraving was coming into fashion, and n art matters there is a fashion as much as in bonnets or dresses; the engraver had become a simple follower of the line laid down by the artist, he was the most clever man who followed slavishly the design without daring to think for himself; he had sunk his manhood, and become the bond-servant of an artistic master, certainly not lacking in impudence. When I look back on the designs of those days, I marvel at the simplicity of those who catered for the public, that public who can be led by the nose for a time by any stupidity. This age of cross-hatching, "or the bird-cage style of art," was the opportunity of the photographic process.

Zinc Etching.

So you see photography had got its foot in, and now the entire body was introduced to the shivering engraver. The publishing fraternity flew to the arms of the new love; prices began to be reckoned by square inches, no matter what the subject, it was all charged by the foot rule, the only stipulation being that the design should be drawn in line on Bristol board with black ink, and no erasure or muddle was allowed. I dare say some of these things have been altered, but only in small matters, and the system of producing was, and is to-day, much after this manner:—A negative is taken by the collodion process—a process, in my opinion, dry plates cannot hold a candle to, except for convenience and rapidity—and a zinc plate ground to a perfectly even surface, coated with albumen and a saturated solution of bichromate of potash, and evenly distributed by the plate being whirled round very rapidly, the surplus solution falling off; when dry, it is exposed under the negative till the perfectly clear lines are well printed; but the protected white is untouched by light. When the plate is sufficiently printed, it is removed and coated with ink; under the tap of water the free bichromate is washed away, that affected by the light—"the lines of the design"—being insoluble by the action of light. Now, with a clean roller, covered with lithographic ink—a greasy ink—the plate, being kept well covered with water, is rolled up again, and, if properly done, the design should be perfect, even to the most minute detail. I think you will at once see how easy it is in theory. A bath now of acid and water is prepared, and the zinc, protected by bitumen in all parts not wanted to be cut away also the back and edges, is placed in a wooden trough pitched inside, and the acid water poured over it in one even wave, and kept rocking till the surface has been eaten away, leaving the design just slightly in relief. Now, the acid has a knack of working after the manner of a scythe, and directly it gets under the surface it begins to undermine the delicate lines. To prevent this, the plate is taken out of the bath, inked up again, and warmed over a stove; being warm, it runs down the sides of the lines and so protects them from the acid; again and again this process is repeated, using softer ink; and a very delicate process it must be to prevent the fine lines being injured. There are two dangers to the publisher. The incompetent and cheap man will either lose the fine lines, or make them a series of dots, or else leave off the etching process before a sufficient depth is attained for the printer.

Screen Work.

This desirable state had been reached when again the publishing world was startled by a new departure in art matters, and this time it came from America. Our friends across the water had been working steadily upon the art of engraving, and now the American magazines became famous here, the great point being that a number of pictures were all jumbled together in one block, so that you had doubts whether the funnel of the steamboat in one picture was, or was not, the leg of the man in the picture above, further than that they were very fine—so fine in fact that English printers could not understand how ever it was possible to print them at all. Away went the brilliant publishers after the new craze, and the bird-cage draughtsmen were voted low and coarse, and the artist who could draw with lamp-black and Chinese white became a hero, especially if he could splice twenty pictures on a page; and, as for the engraver who could engrave very fine, he was, indeed, a treasure, and the printer became "for a time" more ill-used than ever all round. There was nothing for it but that he should get better machinery, the paper must be better, and blocks must be made really with greater knowledge and care, and better ink must be used. All this time the poor process man was going through a very rough time—like Othello, his occupation was gone; but now, with a courage very commendable, he set to work to tackle the drawings in lamp-black and Chinese white, and to-day there are many systems that profess to render a tone drawing; they vary slightly, but in the main are the same; the drawing is focussed in the usual way, but a screen of lines is placed between it and the sensitive plate; sometimes the lines of screen cross at right angles to each other, sometimes they are diagonal, the result being that in the negative the picture is cut into thousands of squares, and in the finished print on the zinc it is repeated; therefore the acid eats the lines away, leaving the design ut all over, and it becomes a printing block. You see, again, how simple it all is in theory. Let me clearly lay the position down here. On the one hand, we have the design requiring an engraver to render it for the printer, in the second process we do it by mechanical means, although the success depends upon the thoughtful and clever manipulation of the operator, and every part of the process must be very perfect, or the result is failure; this, so far as the line (or pen-and-ink drawing will, perhaps, make me better understood) is concerned, but as regards the tint, or wash-drawing, there are difficulties I must now deal with. Drawings in tone are made for photographing on wood of lamp-black, ivory black, or Indian ink, and Chinese white, some artists only using the white very sparingly, just to mark out a fold of a dress, or take a line off the face, any little matter in finishing that seems necessary; others use the black pure, as washes, in parts, and in other washes, to increase the charm of the drawing, an admixture of white, sometimes painting white upon white to trick the drawing, and give cheap finish; others mix every tone with white, and use the colour freely, killing the paper on which the drawing is made after the manner of thin oil painting.

Tom Symmons.

(To be continued.)

PHOTOGRAPHERS' ENGLISH.

The modern photographer, especially when of the amateur division is eminently and specially characterised by a certain *bonhomie*, which seems to find vent in a kind of missionary spirit—a desire to communicate in brotherly love, his private "experiences," struggles, and final victories, gained either by his own cleverness, or through some "new tip," or new form of apparatus or material, which he then nearly always terms a "boon." The way in which this word "boon" has been appropriated by the amateur photographic fraternity is remarkable. "Advantage," which it has replaced, has now no chance, at least among photographers.

"Utilised," for used, is another fine, round-sounding favourite.

Frequently, when an amateur is in great haste to communicate, he seems blind to the sad havoc he makes of the Queen's English, and, considering how very much the schoolmaster is abroad just now, and the vast sums spent by the State on schooling for high and low, it is really surprising to see so much want of knowledge of the native tongue even among persons possessing titles indicative of the fact that they have graduated at a University, or have been honoured by the fellowship of learned bodies.

I take a few instances to begin with from a recent publication. I have, in some cases, indicated by italics the parts I take to be erroneous.

First, we have a sample of queer English by one gentleman, who writes: "A still better plan I thought to have a frame made," &c.; then an example of odd etymology by another, who tells us "of development processes perhaps the most *favoured* is the slow bromide."

No doubt *favourite* is meant.

A third gentleman, who aims apparently at a style combining facetiousness with a *soupçon* of literary culture, writes:—

> "'Ask of the wind that *round about*
> With fragments *strew* the sea.'"

When will people cease to trust to their memories, and purchase quotation books?

A fourth, who gives his address as "India," writes: "*Some hand cameras* consist of *an* ordinary camera enclosed in a box."

I have myself a very "ordinary" camera. I have been wondering if, on enclosing it in a box, I might become the happy possessor of "some hand cameras." But, alas! I have no faith in such legerdemain.

Mr. Charles S. Patterson, at p. 131, gives "Hints on Medical Photography," which title, it appears, describes photography, not of medicals nor medicines, but of patients who constitute interesting or rare cases. Perhaps the opening sentence of Mr. Patterson, M.B., in recommending the flash light is the gem of the whole collection. He says, "The exposure is made so rapidly that transitory attitudes, or even slow *movements*, may be *portrayed*.' This splendid example of the method of conveying what one means by phrases of an exactly opposite signification betrays at once Mr. Patterson's nationality. He is evidently of Hibernian extraction.

Of course, no photographer ever "portrayed a movement." His

picture may have indicated motion, but that is what Mr. Patterson claims to avoid. And what is a "transitory attitude?"

A Mr. Mathews, who is evidently a strong adherent of the now half-forgotten Tichborne claimant, gives (p. 139) a good example of the grandiose and pedantic in "the transference having satisfactorily eventuated in the presentation of an unmistakable unison of the divided parts." In the vulgar tongue this means, "On interchanging the parts they were seen to match."

Observe the "transference" and "unison," used really for transposition and correspondence, as he is speaking of two portraits, one of Roger and one of Orton, which had been each cut in two, and the right-hand halves interchanged to see how they matched the remaining left-hand halves. The remarkable fact that the correct words are even longer than those used, suggests that this style of writer probably thinks more of sound than sense, and the first big round word that comes goes down, if it at all approaches the meaning.

Macbeth's wild war-shout, "The cry is still 'They come!'" seems hardly happy in reference to blisters on silver prints, p. 145. After the description of the very efficient method for getting rid of the blisters, it would have been trite and appropriate to add, "Come like shadows, so depart!" But let us hope Mr. Flamant was not really a reader of Macbeth.

Mr. Varley, F.R.A.S., gives us some remarkable science on p. 204. He says, "Light decreases as the square of the distance of the luminous body." This is lamentable, and from an F.R.A.S., too! Fill up the ellipsis, and it reads, "Light decreases as the square of the distance of the luminous body decreases." In other words, the nearer the candle the more in the dark. Truly, this may apply to the luminosity of the author in this particular case, but not in ordinary experience. Referring to some work of Dr. Wollaston, we are also informed:—

"The value of Sirius he gives as being that of one two-hundred-thousand millionth part of that produced from the Sun, the sun being equal to the light produced by 5763 wax candles burning at one foot distance from the screen."

In the first part of this curious sentence replacing Sirius by "the light of Sirius" makes at least sense. What the second part means is open to conjecture.

In a little work called the *Photographer's Systematic Exposure Note-book* I find the following curiosities under the heading "Tests for Water:"—

"Test for hard or soft water. Dissolve a small quantity of good soap in alcohol: if it turns milky, it is hard—if not, it is soft."

Hard or soft soap I suppose, since, though there is such a thing as hard drinking, who ever heard of hard or soft alcohol? and only soap and alcohol are mentioned. But what about the water we wanted to test?

Test for acid. Take a piece of litmus paper; if it turns red, there must be acid; if it precipitates on adding lime-water, it is carbonic acid. If a blue sugar-paper is turned red, it is a mineral acid."

Here is a wonderful piece of litmus-paper! It is to be "taken," whether "internally" or merely between the finger and thumb deponent sayeth not, neither are we informed what colour it may be at first; but "if it turns red there must be acid." Where? The next clause informs us. Evidently the paper is the acid. If "it" precipitate, "it" is carbonic acid. The pronoun clearly refers to the paper as in the first part of the sentence.

The last sentence of this noteworthy piece of scientific description defines a certain kind of mineral acid very neatly. This acid, according to our brilliant and lucid author, is a blue sugar-paper that is turned red. How it can be blue and be turned red at the same time is difficult to see, but this is no doubt one of the peculiarities of this particular mineral acid.

To say that all blue sugar-papers (by the way, what is a sugar-paper?) that are turned red are mineral acids does not, fortunately for science and the arts, imply that all mineral acids are blue sugar-papers.

J. BROWN.

Our Editorial Table.

THE BEGINNER'S GUIDE TO PHOTOGRAPHY. (4th Edition.)
PERRY, SON, & RAYMENT, Hatton Garden.

WHAT we have said of previous editions of this little work applies to that now issued. The information given is terse and practical, and easily appeals to the understanding of those for whom it is intended. At the present moment the chapter on "Hand Cameras" should be of special value. As an introductory guide to photography the work admirably fulfils its object.

THE April number of the *Manufacturers' Engineering and Export Journal* devotes a large portion of its space to an illustrated description of Messrs. Siemens' electrical works at Woolwich. The illustrations are many in number, and are from photographs by Messrs. Elliott & Fry and Negretti & Zambra. As examples of interior photography, we have seen nothing finer, but the process worker and the printer has done them scant justice.

THE DALLASTYPE SHAKESPEARE.
J. E. GARRATT & Co., 48, Southampton-row, W.C.

WE have received Part I. of a reproduction of the first folio edition of Shakespeare's works by Mr. Duncan C. Dallas. As a specimen of photographic reproduction the work is admirably done, and is well printed. This *facsimile* edition should find great favour among lovers of Shakespeare, and when complete will form a handsome and valuable addition to the library.

WITH the current number of *Judy* is presented a reprint of its first issue, which appeared on May 1, 1867. Curiously enough, No. 1 of *Judy* has a photographic joke. A bearded swell of the period has handed his lady cousin his photograph with the remark, "Good, is it not? I was done in Regent-street;" to which the lady (?) replies, "Oh, indeed! Done in Regent-street, was it? Done, certainly; but, cousin, it might have been done in the Zoological Gardens." From the quality of the humour one would never have supposed our "funny" contemporary would have lived a quarter of a century.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
May 9	Darlington	Trevelyan Hotel, Darlington.
,, 9	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 9	Norfolk and Norwich	Bell Hotel, Norwich.
,, 9	North Middlesex	Jubilee Hall, Hornsey-road, N.
,, 10	Derby	Smith's Restaurant, Victoria-street.
,, 10	Great Britain	50, Great Russell-st., Bloomsbury.
,, 10	Manchester Amateur	Lecture Hall, Athenæum.
,, 10	Stockton	Masonic Court, High-street.
,, 11	Leicester and Leicestershire	Mayor's Parlour, Old Town Hall.
,, 11	Munster	School of Art, Nelson-place, Cork.
,, 11	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 11	Reading	
,, 11	Stockport	Mechanics' Institute, Stockport.
,, 12	Birkenhead Photo. Association	Association Rooms, Price-street.
,, 12	Bradford Photo. Society	30, Godwin-street, Bradford.
,, 12	Camera Club	Charing-cross-road, W.C.
,, 12	Cheltenham	
,, 12	Hackney (Annual)	Morley Hall, Triangle, Hackney.
,, 12	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 12	Manchester Photo. Society	36, George-street, Manchester.
,, 12	North Kent	Gravesend.
,, 12	Oldham	The Lyceum, Union-street, Oldham.
,, 13	Cardiff	
,, 13	Holborn	
,, 13	Maidstone	"The Palace," Maidstone.
,, 13	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 13	Richmond	Greyhound Hotel, Richmond.
,, 13	West London	Chiswick School of Art, Chiswick.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 28.—Mr. S. J. B. Wollaston in the chair.

Messrs. H. Heather and T. Stevenson were elected members.

A question from the box was as follows:—"Can permission be obtained to take photographs in the British Museum; if so, to whom shall I apply?"

Mr. T. E. FRESHWATER said it was necessary to apply to the heads of departments in which the objects wanted to be photographed were placed.

A second question asked whether an intensifier that had been recommended was a good one. It consisted of bleaching with mercury, followed by caustic soda.

Mr. W. E. DEBENHAM doubted the permanency of the results unless sulphide were used to blacken the image.

Mr. J. BARKER said he had used mercurial intensification for twenty-five years, and had found simple washing sufficient to ensure permanence. He did not know when the results he had got would fade. He bleached right through, washed well, and treated with ammonia. Images only bleached superficially were fugitive. He washed for seven or eight hours, and never for less than four.

Mr. J. E. SMITH said that he had intensified with the formula quoted as well as with one having ammonia instead of the hydrate. The ammonia gave the darkest and best images for his purpose (copying pencil drawings), in which he wanted to get as much blackness as possible.

Mr. W. E. DEBENHAM recommended for the purpose iodide of mercury, followed by Schlippe's salt.

A third question was: "Is there a spectacle lens that can be used in con-

junction with a doublet of nine-inch focus that will reduce the focus to about half; and, if so, what number is it? Where should it be placed, in front, behind, or between the lenses?" The answer was a nine-inch spectacle lens should be used, and placed in the middle of the lens.

Mr. J. S. TEAPE had made experiments with a sample of the non-actinic medium shown at a previous meeting by Mr. F. A. Bridge, and found it excellent as a protective medium for the light of the dark room. He had made a number of holes in a piece of opaque material, behind which he had placed various thicknesses of cherry and golden fabric, as well as one thickness of the new material. An Ilford plate was then placed in contact, and magnesium ribbon burnt. Development of the plate showed that the new material was quite safe as compared with the other substances. It passed a great deal more light.

Mr. W. H. SMITH (of the Platinotype Company) demonstrated the new cold bath platinotype paper, developing a number of prints from negatives by Messrs. Drage, Frith, and Edwards. He said the only difference between this and the other papers was in the development, the developer being exactly the same as used in the hot-bath process, but used cold. A cold developer was much handier to employ, and, if its temperature even went so low as near freezing, it made little difference. The loss from evaporation was very slight. The prints took longer to develop, but air bubbles were got rid of entirely. He left a large undeveloped patch in the centre of a print for several seconds; upon development no mark could be seen. Finger-marks, made by the developer on undeveloped prints, did not show when the whole of the print was developed. With the other papers, if they were folded before development, white lines appeared; this paper could be broken or folded without any such lines appearing. Mr. Smith also showed practically that development could be localised, and accomplished either by the fingers or a brush. He said that with the new paper the blacks were better than those given by the old, and, indeed, results generally were better, as they could see. Under-printed pictures could be improved by warming the bath, which could be done up to 130°. The effect of weakening the developer would be to prolong development.

Mr. P. EVERETT asked whether the sensitising solution alone could be procured, so that, if necessary, additional work could be placed on a print?

Mr. T. BOLAS said that a wash of Indian ink would be preferable.

Mr. SMITH said another deposit could be obtained on a developed print in the way Mr. Everett suggested, but it would be necessary to wash the developer off, dry, sensitise, and expose again. In "clearing" prints, he advised a final washing in solution of carbonate of soda to neutralise the acid. All the other manipulations of the new paper were the same as the old

In moving a vote of thanks to Mr. Smith for the demonstration, the Chairman, as one of the oldest platinotype printers, said the advantages of the new paper were enormous. Finger-marks would not show, damp and "breakages" produced no effect, and the printing in of clouds had been simplified. It was a power to be able to develop with a brush. There was also another advantage, in crystals of the developer not now depositing, as in the hot-bath process.

Holborn Camera Club.—April 29, Mr. Fred. Brocas in the chair.—Mr. R. Luxton gave a demonstration on *Photo-mechanical Work*, this being, perhaps, one of the first of its kind ever given before a club of this description. Mr. LUXTON showed the various stages of the process, viz., 1, the making of the solution to coat the plate; 2, passing the plate through a bath of acid and alum; 3, coating the plate with albumen; 4, printing on the zinc, and developing the image; 5, rolling up the plate for etching; and, last, etching the plate. The demonstrator went through the different stages in their turn, showing very clearly the manner in which the work is done. He gave various hints which he had learned from his long experience of the work, and thoroughly interested the members present with one of the most practical demonstrations which have been given before the Club.

Hackney Photographic Society.—April 28.—The American lantern slides were exhibited. Samples of the Imperial Dry Plates were handed to the members by the Hon. Secretary, with a request that results were shown and opinions given. The Club Album, containing portraits of the members, was placed on the table. The rest of the evening was set apart for sale and exchange of apparatus, the idea being that many members had things which were not of service to them, and an exchange would be more mutually pleasing. The next meeting will be the Annual General Meeting.

Putney Photographic Society.—April 30, last meeting of winter session, Rev. L. Macdona in the chair.—There was a very fair attendance to witness the lantern slide competition, which resulted as follows:—Class A, Landscape: 1, Mr. A. E. Smith; 2, Mr. William Martin, jun. Class B, Seascape: 1, Mr. A. E. Smith; 2, Mr. L. S. Zachariasen. Class C, Portraiture, &c., 1, Rev. L. Macdona; 2, Mr. Wm. Martin, jun. Mr. Cembrano, of Richmond, officiated as judge. Great satisfaction was expressed with the samples of the new Imperial Dry Plates, distributed at the former meeting, capital results having been obtained. The Annual General Meeting will be held on May 11.

Richmond Camera Club.—April 22, Mr. Cembrano in the chair.—Mr. F. Hollyer gave a demonstration of platinotype printing with the new cold-bath paper. On April 29 Mr. A. T. Hare exhibited an optical lantern, designed and made by himself, which presented many novel and ingenious features, and was adapted for every class of projection, from the ordinary slide to the most delicate scientific experiment. Mr. Cembrano then gave an address on the subject of *Development en route*, setting forth the advantages of developing, at any rate, a good proportion of one's holiday pictures before returning home, explaining his *modus operandi*, and alluding to some of the difficulties he had met with, especially in French and Spanish hotels, where water is doled out by the pint. Members made notes and resolutions—with what practical result the coming summer will show.

Croydon Camera Club.—April 25, the President (Mr. H. Maclean, F.G.S.) in the chair.—Mr. J. R. WHITE gave a description of the construction and method of using the optical lantern, and its various adjuncts, illustrated by experiments and demonstrations. The President drew members' attention to an article by Mr. J. A. Hodges on the after-treatment of negatives, and shortly described the *modus operandi* suggested, illustrating his remarks by two process prints, showing the beneficial effects produced by the means employed. On April 30, the first Club excursion of the season was held, when a party of fifteen, conducted by Mr. H. Maurice Page, visited Oxted, and spent a busy afternoon amongst the attractive scenes of this vicinity. On Monday, May 9, Mr. E. J. Wall will lecture at the Club-rooms, 56, George-street, on *Development*.

Bath Photographic Society.—April 27, Mr. Austin J. King in the chair.—The CHAIRMAN said the first business of the evening was a notification by the Secretary of the decease of their good friend and member, Mr. John Dugdale. Since the foundation of the Society he had worked steadily for its welfare, by giving lantern-slide exhibitions, and in other ways contributing to the interest of the meetings. Throughout a long life in Bath he had been greatly respected. The Chairman then spoke of the arrangements made by the sub-committee regarding the Exhibition of Photographs in conjunction with the Floral Show announced for May 18 and 19, and he was pleased to say that their sub-committee were able to report that the Floral Fête Committee not only coincided with the conditions stipulated, but placed themselves almost unreservedly in the hands of the Society. He thought a most successful result would be achieved. The Chairman then vacated the chair, in order to deliver his promised lecture, *With the Camera in Spain*. Critical examination of summer outfits, and laying aside for the coming winter of enlarging apparatus, reducing cameras, lantern-slide paraphernalia, &c., were amusingly portrayed. Plentifully equipped for all sorts of subjects, and full of hope in the achievement of a rich harvest of negatives, the lecturer took an adieu of this country when the Thames wore a dense mantle of yellow fog, to penetrate which colour sensitive plates did not avail. The dream of snap-shots on an ocean-going steamer was again dispelled. Then followed rigid regulations against the camera in the neighbourhood of Gibraltar. These and other difficulties were encountered until the photographer's El Dorado was reached, the beautiful, the unique Alhambra. The lecturer's description in the first place was technical from a photographic point, he then entertained his audience with details of a general character, dating back from the earliest history down to the present day. Speaking of bull-fight photographs, Mr. King said the reason such illustrations were rare was due, not to the rapid movements of the actors so much as the large area over which the fight was enacted; thus the principal objects were by distance minimised. The President hoped his paper would open discussson, especially on film photography, a subject which the Chairman, of all others, could ventilate. The CHAIRMAN remarked that he preferred the celluloid films of considerable substance used as plates are in the camera and separated by cardboard. Roll holders he did not fully appreciate.

Liverpool Amateur Photographic Association.—April 28, Mr. W. Tomkinson in the chair.—Four new members were elected. The President announced that very satisfactory arrangements had been made with respect to the new club-rooms, and the work of fitting up would be proceeded with as soon as possible. He also stated what had been done in the way of arranging excursions for the season, and gave an account of the annual dinner, which had taken place at the Adelphi Hotel on Monday, April 25. His Lordship, the Mayor, was present on the occasion, and expressed his willingness to become a patron of the Association. The dinner was one of the most successful and enjoyable that had been held. Mr. J. T. Norman-Thomas reported on the excursion to Crosby and Ince Blundell, at which upwards of eighty persons were present, and something like 450 exposures were made. Some of the work was on exhibition at the meeting, and was of excellent quality. Some stereoscopic slides and monthly competition prints for January were exhibited during the evening. Several novelties were shown, and a number of members' slides were passed through the lantern. On the motion of Mr. B. J. Sayce, the recommendation of the Council, that Mr. H. P. Robinson be elected an honorary member of the Association, was unanimously adopted.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—April 25, Mr. John Watson in the chair.—The outdoor meetings were arranged, the places selected being Stocksfield, Down the Tyne, Gilsland and Naworth, and Wark. Mr. F. Park then read a paper on *Enlarging* [See page 297], illustrating his remarks by a photograph of the apparatus employed, and by a series of finished enlargements of very superior qualities, afterwards developing several others by means of eikonogen.

South Manchester Photographic Society.—April 25, Mr. W. I. Chadwick in the chair.—Messrs. J. J. Arnold, H. J. Reid, E. Tarbolton, A. E. Tysoe, and H. Worthington were elected members. Prints from negatives taken at the previous meeting by magnesium flashlight were exhibited, and one exposed by the Hibbard flash-lamp was pronounced decidedly the best, and proved to all present that, with judicious management and a little experience, admirable portraits were quite possible, as the exposure in this case had been quite sufficient. Other lamps of the duplex form were not considered to possess any greater advantages. Members had been invited to bring specimens of their work done during the Easter holidays, but, owing to the shortness of the time, not many results were shown. Mr. Chadwick exhibited about thirty stereoscopic transparencies, made on Thomas's ground-glass plates, and developed with eikonogen. These were handed round to the members with a suitable stereoscope. They were much admired, and it was remarked that an additional ground-glass backing was a wonderful improvement. One view in strong sunlight, taken "against the sun," Mr. Chadwick had printed very deeply, and, by the addition of a pale blue glass backing, a delightfully realistic moonlight view was the result. Another highly interesting slide was one taken from the Menai Suspension Bridge, showing the ironwork in the foreground, with a landscape of the Straits in the distance, and demonstrated in a wonderful manner the great advantages of stereoscopic pictures over all other photographs. The whole of Mr. Chadwick's transparencies were printed by gaslight, and developed in one evening. Mr. Bowden exhibited a lanternscope, which is intended for use in viewing lantern slides; but, when a lantern slide and a stereoscopic slide from the same negative were compared, the difference was undoubtedly in favour of the stereoscopic one. An outdoor meeting was arranged to take place next Saturday at Miller's Dale.

Edinburgh Photographic Society.—The first out-door Saturday ramble for the season was held on April 30. Linlithgow Palace and its surroundings was the place chosen for this day's work. The palace itself is a picturesque ruin, situated in the heart of the small town, and overlooking a small lake, and it affords many fine views, as well as bits of ruined architecture of the best period of Scotch baronial taste. On the same day a number of members of the Edinburgh Architectural Association (some of whom are also of the Edinburgh Photographic Society) were present, meeting with the Provost, magistrates, and several members of the Town Council, making a minute survey of the ruin, with the view of commencing some necessary repairs, if not restoration of the entire fabric, which was destroyed either purposely, carelessly, or accidentally, while in occupation by the troops under the Duke of Cumberland, while putting down the Stuart attempt by Prince Charlie in 1745. A small sum has been voted in Parliament for the purpose, but much more will be required to make the old Scottish palace anything like what it was—one of the finest buildings in the country. The day was a fine but very breezy one, and this gave some discomfort to several of the lighter-equipped members of the party, but on the whole a very pleasant day was spent, and many good pictures secured, several with fine cloud effects. Full permission had been granted by Mr. Robertson of H.M. Board of Works to go over the entire building and grounds, and photograph whatever was of interest. There were about twenty members present with their cameras.

Leith Amateur Photographic Association.—April 26. Mr. Smith (Vice-President) in the chair.—A paper was read by Mr. L. C. Abbot, entitled, *Notes on Isochromatic Plates*, in which he gave his experiences with them in the field. He stated that he could not as yet give a definite opinion on their superiority over the ordinary plates, as that would require a much longer trial than he had been able to give; but, so far as he had gone, the results were fairly satisfactory and such as to induce a much more extended trial. A brief discussion ensued, and several questions were asked, to which Mr. Abbot replied. It was announced by the Chairman that the Committee had agreed to have an outdoor meeting on the Queen's birthday, and that the Association had received full liberty to photograph in the grounds of Raith House, Kirkcaldy, the demesne of Mr. Munro Ferguson, of Novar and Raith, the M.P. for the Leith burghs, and he trusted that they would have a good day, and a capital turn-out of the members. This concluded the business, and the meeting adjourned.

Photographic Society of Philadelphia.—April 13, Annual Meeting, the President, Mr. John Bullock, in the chair.—The appointment of the following Special Committee on Standards was announced:—Professor Benjamin Sharp, Messrs. George W. Hewitt, Theodore H. Lauers, Lewis T. Young, and William H. Walmsley. During the year six members had been lost by death, thirty-four new members were elected, the total number now on the roll being 200, or about the same as at the date of the last report. In view of the fact that the annual dues had recently been doubled, this fact was considered very gratifying. The election for officers and directors for 1892-93 resulted as follows:—*President:* Mr. Joseph H. Burroughs.—*Vice-Presidents:* Messrs. Edmund Stirling and Charles R. Pancoast.—*Directors:* Messrs. John C. Browne, Charles L. Mitchell, M.D., John G. Bullock, William H. Rau, Frederic E. Ives, Samuel Sartain, George M. Taylor, and John Carbutt.—*Treasurer:* Mr. George Vaux, jun.—*Secretary:* Mr. Robert S. Redfield. An illustrated lecture was given by Dr. Benjamin Sharp, his subject being *A Trip through the West Indies*, which was followed by a demonstration of the process of making lantern slides with gelatine dry plates.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

"PHOTOGRAPHIC PORTRAITS."

To the EDITOR.

SIR,—Mr. Cimabue Brown, jun., appears to flatter himself with the delusion that I imagine his pseudonym to "veil a distinguished identity." I have not the remotest idea concerning his individuality, but I should certainly never dream of suspecting him of being distinguished in any way. My endeavour was to draw attention to a reprehensible practice in photographic journalism, and I was not disinclined to avail myself of the co-operation (however, otherwise, it might be qualified) of Mr. Cimabue Brown, jun. Having succeeded in my object I have no further use for him nor interest in him. If, therefore, he continues individually to emphasise the practice referred to, I shall not complain. So far as I am myself concerned the incident is closed.—I am, yours, &c.,

Sunbury, May 3, 1892. ALFRED MASKELL.

[We terminate this correspondence, into which we cannot help saying that our good friends have imported considerable acrimony and uncalled-for hard hitting, by quoting from a letter which we have received, in reference to Mr. Cimabue Brown's statements in our last issue, from Messrs. Steadman, Van Praagh & Sims, solicitors. These gentlemen inform us that our correspondent's letter conveys either that some member of the trade has bribed their clients, the proprietors of the *Optician*, to write a certain style of photographic work down, or that he is pecuniarily interested in the paper. They state that rumours to this effect have been in circulation for a considerable time, and we are asked to say that neither the gentleman referred to in Mr. Cimabue Brown's letter, nor any other person whatever, has, besides the proprietors, directly or indirectly any interest in the *Optician*, or has taken any part whatever in the conduct or affairs of that journal. We are happy to comply with the request of Messrs. Steadman & Co., who are also good enough to offer us facilities for assuring ourselves of the absolute truth of their statement, the accuracy or inaccuracy of which, however, is Mr. Cimabue Brown's concern alone, and not ours.—ED.]

PUBLICATION OF PATENT SPECIFICATIONS.

To the EDITOR.

SIR,—As you always give great prominence to the patent applications and specifications connected with photography—a feature of the JOURNAL which I, no doubt in common with many other inventors and patentees, highly appreciate, will you allow me a line of space to complain of the slipshod manner in which the publication of the *Patent Journal* has lately been conducted? Nominally it is due at ten o'clock on Wednesday morning, but as a rule it is late in the afternoon before it appears, and sometimes it is not accessible till Thursday morning. Cannot some M.P. ask a question in the House on the subject?

May I also suggest to the authorities of the Patent Office the provision of a simpler plan for enabling one to ascertain what applications have been made during the current week, pending the appearance of the *Patent Journal*? At present, if one wishes to find out what applications have been made in connexion with a particular subject, it is necessary to hunt through many hundreds of slips of paper placed in little pigeon-holes, alphabetically arranged according to the names of the applicants, a process which consumes a fearful and wonderful amount of time. Surely it would be better to provide a book with a cross index of names and subjects for the purpose.—I am, yours, &c., PATENTEE.

Stoke Newington, May 4, 1892.

[Our correspondent's letter reaches us at a moment when we have reason to indulge in complaints similar to his. We do not doubt that the authorities of the Patent Office library will take steps to remove the inconvenient system at present adopted there. We hope also that the publication of the *Patent Journal* will in future be arranged with a better regard for punctuality and regularity.—ED.]

ACTINOGRAPH SPEED OF PLATES.

To the EDITOR.

SIR,—I can quite endorse every word uttered by Mr. Carter Browne in last week's issue on the above subject. I have been trying for some time to get the correct speed for the Ilford Ordinary plates, as per Hurter & Driffield's actinograph. I have applied to the makers of the plates, also to Messrs. Hurter & Driffield, the makers of the actinograph, but cannot obtain the information, and, being quite satisfied with the brand of plates I am using, I would not like to have to change to any other. While the plate-makers are considering the matter over, perhaps some of our willing helpers might give us their experience.—I am, yours, &c.,

April 30, 1892. H. PYNE.

HONOUR TO WHOM HONOUR IS DUE.

To the EDITOR.

SIR,—My attention has just been called to a report, in your issue of April 29, of the doings of the North Wales Amateur Photographic Society, in which the following passage occurs:—"One view of Gloddaeth Hall is very fine indeed, and, in order to obtain it, Lady Mostyn had a lofty stage erected, under Mr. Slater's direction, for him and his camera."

As a matter of fact, the stage was erected for Mr. Edge, of this town. Acting upon the suggestion of Lord Mostyn, and by the kind permission of Lady Augusta Mostyn, I made use of the stage in order to obtain a photograph for the album which was presented to the Queen of Roumania by the people of Llandudno.

It is quite true that I obtained several good negatives of Gloddaeth Hall, but not one of them was taken with a rapid rectilinear lens.—I am, yours, &c., J. SLATER.

Llandudno, May 3, 1892.

[We have also received a communication from Mr. T. Edge, of Llandudno, drawing attention to the error which Mr. Slater points out.—ED.]

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Wanted, good studio stand in exchange for background.—Address, E. V. WILLIAMS', 3, Bellvue-terrace, Southsea.

Will exchange whole-plate tripod folding stand, two backgrounds, interior and exterior (cloth), and two volumes *Amateur Photographer*, 1890 and 1891, for show-case, size about 30 × 20.—Address, J. WARE, 40, High-street, Atherton, near Manchester.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

W. H. Fischer, Withington, near Manchester.—*Photograph of His Grace Herbert, Archbishop of Westminster.*

W. C. BAX.—We have no knowledge of the matter. Write and threaten the man who is personating you with legal proceedings.

F. G. S.—The firm referred to is of high standing, and would not, we are sure, make claims for the camera which it does not possess.

F. P.—We cannot trace the particulars. The Air Brush Company has no agent in this country. Communicate with Mr. J. J. Atkinson, of Liverpool.

W. W. SMITH asks for a good pyro and ammonia developer where the pyro is used dry and the ammonia ·880 by itself.—There are many such formulæ in the ALMANAC for 1892.

PRINTER.—If the fixing and subsequent washing were properly done, there would possibly not be any difference in the permanence of the results of fixing a washed and an unwashed silver print respectively.

CAMBS.—1. We are not acquainted with any book dealing with the working up of black and white enlargements. 2. Place yourself in communication with Mr. Redmond Barrett, of 50, Kellet-road, Brixton, S.W.

PUZZLED.—As you do not sufficiently describe the effect obtained by your present system of lighting, it will be better if you will send us two or three unmounted prints illustrating this. We can then be able to advise.

JOHN LEWIS.—At first sight, we should say that the varnish mentioned was bound to darken by heat; but pending our making a trial of it, would you kindly indicate the page of the JOURNAL where it was recommended?

CONCENTRIC.—We cannot explain why your lens works sharply on portraits and is imperfect for lenses unless we saw it. But if it fails to give a sharp landscape without the employment of a stop, then we advise you to use a stop.

PYRO (Johannesburg).—We are unable to help you in the matter of high charges made for the JOURNAL and ALMANAC by South African booksellers. Why not subscribe direct? We should be pleased to have the promised notes.

COL. GUBBINS.—We think your suggested remedy of squeegeeing the negatives on to glass the best available, and should not think the sizes or shapes would be altered in so doing. From the print sent we should say the original negative was excellent.

J. ALLEN (Penrith).—There is no absolute rule for determining the distance to which the lenses on a binocular camera should be separated from each other; but, for such sizes as half-plates, it is expedient to fix them as nearly as possible opposite to the centre of each half of the plate.

H. K.—We are scarcely in a position to advise as to the comparative merits of the two lenses mentioned, never having seen the No. 1 on your list—we refer now to utility for general purposes; but we here endorse all that we said on behalf of the latest entrant into the field.

C. PANEL.—The cause of the stain on the panel picture is that some of the colouring matter of the mount has penetrated it. If you will cut a mount in two, you will see that one of the upper sheets is exactly of the colour complained of. If using these mounts in future, employ a waterproof mountant.

J. B.—Electro casts can most undoubtedly be obtained from gelatine moulds. The surface may be rendered "conducting" in a variety of ways; plumbago and bronze powder answer well, but it is probable that sponging over with a solution of nitrate of silver (largely alcoholic), and then reducing the metal by any of the well-known methods, will answer better for the most delicate class of work.

STUDIO writes: "Would the local board require a plan for a studio on the main road if laid on the ground like a canvas tent, or could they demand a plan or refuse to allow me to put a canvas tent, fastened with stakes in the ground, if the owner of the ground gave me permission to do so?"—Probably not, as the studio would only be temporary; but we should recommend you to consult the local surveyor in the matter.

NEMO.—In the aniline process paper was coated with a sensitising solution, consisting of—Potassium bichromate, thirty grains; phosphoric acid solution, one fluid drachm; water, one fluid ounce. Expose behind a transluscent positive in the ordinary printing frame for about a third of the time required by silver paper. Develop with the vapour of aniline, made by mixing one drachm of commercial aniline with two ounces of benzole. Wash in plain water, and afterwards in water acidulated with sulphuric acid. The process cannot be worked on glass.

F. T. says:—"I have invented an exposure meter which is automatic in action, giving the plate correct exposure in any intensity of light. It could be applied to any ordinary camera, would be cheap, light, and portable. I should be greatly obliged if you would give me your candid opinion as to whether you think this invention would be worth protecting by letters patent, also if such a thing has been done or tried before."—There are several exposure meters in existence, but we do not think any of them are fitted to an ordinary camera. We could not say whether our correspondent's invention is worth protecting without first having some particulars of it.

ORION.—While we recommend you to save yourself the trouble of making potassic oxalate by purchasing it ready prepared, yet is its manufacture a matter of extreme simplicity. Make a saturated solution of carbonate of potash, and add to it oxalic acid until effervescence ceases, and—there you are. If you prefer having it in the crystallised form, pour it out in a flat dish, and allow the liquid to evaporate.

FADED PRINT writes: "Will you examine the enclosed photographs and tell me what is the cause of their going in the way they have? These, with a number of others, have been in a show-case a few months, and all have gone more or less. Is it, first, the mount which causes it? or, secondly, the possible dampness of the wall where case is fixed, as it is outside in an exposed situation? or something wrong in the manipulation? If the latter, what is it?"—In reply: Probably the hypo was not entirely removed from the prints in the final washing, and the damp has reacted upon the little that was left in them and caused the fading. Had the pictures been kept in a perfectly dry place, they would not have changed. We do not think the mounts are *ab initio* at fault, but you put them to a very severe test.

SILVER.—Assuming the silver to be pure, it should be placed in a beaker, and strong nitric acid, sp. gr. 1·4, poured on it in the proportion of three-quarters of an ounce of acid to each ounce of metal; dissolve by heat; pour into an evaporating basin, and remove the excess of acid by boiling. Redissolve the crystallate in a small quantity of distilled boiling water, and, on cooling, crystals of silver nitrate will deposit. For gold chloride, dissolve the metal in a hot solution of *aqua regia* (hydrochloric acid, three parts; nitric acid, one part). Remove the excess of acid by evaporation, dissolve the gold chloride in boiling water, add a solution of ferrous sulphate until a precipitate is no longer produced, and wash the precipitate on a filter with boiling water until the wash-water no longer yields a precipitate with barium chloride. Redissolve the gold in *aqua regia*, and evaporate to dryness. It would, however, be cheaper and more convenient for you to purchase the salts ready prepared.

THE PHOTOGRAPHIC CLUB.—May 11, *Fancy Printing and Mounting.* 18, *Reversed Negatives.* Outing, Saturday next, May 7, Carshalton. Train from London Bridge, 2.18.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—At the meeting on Tuesday, May 10, Mr. W. J. Harrison will read a paper on *A Proposed National Photographic Record and Survey.* Members of affiliated Societies are invited to attend.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—May 12, Members' Open Night. 19, Monthly Lantern Night; last of the season. 26, *The Photographic Study of Clouds and Lightning*, illustrated by slides, Mr. A. W. Clayden.

MESSRS. MAWSON & SWAN inform us that, owing to the serious fire which occurred at their Newcastle warehouse on Wednesday evening, April 27, their business will be rather seriously inconvenienced for a few days. For the present, however, all orders will be attended to by their London house, and they ask the indulgence of their friends in the meantime.

MR. G. L. ADDENBROOKE is to read a paper at the Society of Arts on Wednesday next, the 11th inst., on the *Uses and Applications of Aluminium*, a subject to which he is known to have given a good deal of attention lately. The application most interesting to our readers is that of the use of this metal for the construction of lens mountings and camera fittings, and no doubt Mr. Addenbrooke will have something to say on this part of his subject. Photographers who wish to attend the meeting can obtain cards of admission if they will apply to the Secretary of the Society of Arts.

MESSRS. MARION & CO. write that, in consequence of the continued success of the "Radial" camera, and from many inquiries for other sizes, they now make it for lantern size and for half-plate size, both carrying twelve plates, as in the original quarter-plate one. The three-and-a-quarter square (lantern size) is very light and compact, and well suited to ladies' use. Although Messrs. Marion recognise that a half-plate hand camera is a somewhat bulky instrument, yet the "Radial" is far lighter, compacter, and more portable than a folding camera with six double backs, shutter, &c.

CHICAGO EXHIBITION.—One of the most interesting exhibits likely to be made by the British Commission at the Chicago Exhibition, will be a large scale map, showing the discoveries which have been made in North America by Englishmen. Though Columbus discovered the West Indies, the credit of first sighting the mainland of America seems—if we put aside the unrecorded investigations of the Northmen—to be due to an Englishman, Sebastian Cabot; and the list of names of English explorers of America, which is headed by his, is a very long and distinguished one. Raleigh, Sir Humphrey Gilbert, Sir Hugh Willoughby, Frobisher, Davis, Hudson, Baffin, in the seventeenth century, were followed, in the eighteenth, by Scoresby and Cook; while the work they commenced was carried on during our own century by the Rosses, Parry, Franklin, Collinson, Maclure, McClintock, Nares, and Markham. It will, therefore, be seen that there is ample material for a map such as that proposed.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1671. Vol. XXXIX.—MAY 13, 1892.

THE KEEPING PROPERTIES OF ROLLABLE CELLULOID FILMS.

At the commencement of a new photographic season the subject of dry plates *versus* celluloid films is one that claims attention. It is not our intention here to institute comparisons, tending to give one an advantage over the other, but rather to confine ourselves, in the main, to an investigation of the subject of films, with special reference to their keeping properties.

We may as well here say that our experience of films wound in roller slides or roll holders has been practically confined to the productions of the Eastman Company, who established themselves among us about seven years ago. About that time, or rather anterior to that time, we had a spool of the Company's sensitive negative paper wound in New York for a 10 × 8 camera, which circumstances prevented our making use of until the Glasgow meeting of the Photographic Convention in July 1887; and it is gratifying to be able to record that, after being kept so long, every exposure made with it yielded a perfect negative. And, although the world was running wild after methods for rendering the paper negatives transparent, in order to hasten the printing from them, and, as some imagined, to destroy the grain of the paper, our negatives were printed from just as they were, no signs of granularity being visible in the prints.

We mention this chiefly because both then and now are to be found hypercritical persons who maintained, both with regard to the negative paper of those days, the stripping film by which it was succeeded, and the flexible celluloid film of the present period, that neither would keep; this last, because the materials employed in making the celluloid film itself were destructive to the salts of silver used in the sensitive film. For ourselves, we never could see any good reason for these predictions, and, so far as they applied to paper, we have quite disproved them.

As respecting the celluloid film, we are enabled to speak of it through the experience of another, an old and well-experienced friend, Mr. W. J. Stillman, of Rome, for we have just seen a large number of 10 × 8 negatives made by him from a roll of the Eastman Company's celluloid film, which Mr. Stillman declares has remained untouched in his Eastman roller slide for more than two years. These negatives are most beautiful in every respect, being free from defects due either to atmospheric or mechanical causes, and we do not grudge our high meed of credit to the Eastman Company for having become the practical pioneers of film photography, and for having, single-handed, accomplished, and reduced to every-day practice, a system of film photography, having within itself all the essentials for success.

Before concluding, let us examine the condition of the film, in virtue of which it seems reasonable to expect it to keep good for an indefinite period, far exceeding the examples cited; and we are not here speaking of the ordinary celluloid film, so called, which is thick, and intended to remain flat like a glass plate, but of the *rollable* film. This is a thin, transparent, flexible preparation of celluloid, having one side coated with a sensitive silver emulsion; and the intention of the makers is avowedly to enable it to be wound upon itself in the form of a roll. At first sight, one does not realise that this method of winding, or rolling the film upon itself, can have any other object than to enable it to be conveniently transported and used in a roller slide; but, upon further thought, one will see that an equally important feature of this method of packing is that the successive convolutions of the rolled film form each upon the other an impervious envelope of inert matter, unaffected entirely by changes of temperature or of moisture. The rollable film thus packed is, in our opinion, in the most perfect form possible for preservation from injury of any kind. And if it be placed within a roller slide, made so as to maintain it in the condition in which it leaves the manufacturers' hands—such a slide as that issued by the same makers—we cannot see aught to prevent its remaining good, and ready for use, during a long term of years.

AERIAL PERSPECTIVE—THE TELE-PHOTO LENS.

We might first of all demur to the strict legitimacy of the above term, for perspective true and proper, which is the science of representing solid objects on a flat surface, ought not to have anything to do with atmosphere; but, as the term aerial or atmospheric perspective has for a long time been in common use by artists to signify a well-known effect, we too employ it in its popular sense. It means the influence of the atmosphere, laden as it usually is with finely divided matter, in obliterating, or rendering indistinct, objects situated at a distance, differentiating, so to speak, the crisp visibility of scenes or objects at varying distances from the point of sight as if a transparent gauze screen were interposed.

It is aerial perspective which, in a large measure, enables us to judge of the distance of objects. There are some countries where the atmosphere is so clear as to enable one to see the details of scenery several miles away with a degree of clearness equalling that of two or three furlongs in other places; and, however valuable a photograph of such scenery may be from a scientific point of view, its value in an artistic sense would be greatly diminished, bearing an analogy to a portrait in which an elaborate background was represented with a degree of sharpness of detail equalling that of the principal subject.

The acknowledged beauty of photographs of English land

scape scenery is largely owing to atmospheric perspective, which, while leaving the foreground and the near distance sharp and vigorous, exercises a softening and subduing influence upon the middle and extreme distance. True, a warm current of air near the surface of the earth produces, so far as definition is concerned, the same effect, although somewhat differing in character. We were made sensibly aware of this a few days ago, when endeavouring to obtain a tele-photo view of the Alexandra Palace from a suburban village slightly over a mile distant from this edifice. The day was singularly clear and bright, and we gladly embraced the opportunity of endeavouring to secure such a view as we knew the new production of Dallmeyer gives us in perfection. To our surprise it failed to do so. But the cause speedily became apparent, when, upon examining the palace through a telescope having a power of fifty times, every stone and ornamental detail of the building seemed as if dancing. This tremor was caused by heated air currents intervening between the window from which the camera was directed and the subject. A few hours later and the air became quiescent; but this was rapidly succeeded by a density of the atmosphere so pronounced in character as to render it undesirable to repeat the photographic experiment at that time.

We mention this, as we can readily conceive of the possibility of others achieving a non-success without being aware of the cause. And, while speaking of this or any other lens of abnormally long focus, we may say that a view of any object taken at a considerable distance away cannot possibly have the same contrasts in light and shade as one of similar dimensions obtained with a lens of short focus from a near point of view. Two hats of equal blackness possess a very different photographic value, if one be placed only a few feet away while the other is removed to a distance of half a mile. While the nearer one is still black, the farther one is grey. Those who employ the tele-photo lens must, therefore, use it with becoming discrimination if the best possible results are desired.

A PHOTOGRAPHIC RECORD AND SURVEY.

The details of the work done during the past year or two by the Birmingham Photographic Society towards securing a "photographic survey" of a portion of the county of Warwickshire, and the further circumstance, as mentioned by Mr. W. Jerome Harrison in the course of his paper at the Photographic Society of Great Britain on Tuesday night, that the completion of the work must occupy some ten or twelve years more, afford us, and perhaps him, a very forcible idea of the magnitude of the undertaking concealed in his suggestion that, to say nothing of individuals, the whole of the two hundred and fifty societies of the United Kingdom should unite, under the protecting wing of the parent Society, to secure a large number of photographs of the face of creation in the British Isles for the benefit of posterity. The term "survey," in such a connexion, is clearly a misnomer, as Mr. Harrison does his best to prove by his suggestions that such pictures may be taken at random by individuals, and by photographic societies on Saturday-afternoon excursions.

The Birmingham Society has gone about the work of the local survey in a thorough if scarcely systematic way, and photography is certainly the gainer by the 1000 or more admirable views it has secured. What value posterity, or even contemporary society, will place on the work, is hard to tell. The success of the Birmingham Society appears to have induced other Societies to engage in similar work in other parts of the country, a fact of which we are glad, as it imparts to the Societies in question a definite end and aim, and a distinct *raison-d'être*. One can understand that the mass of results which the Birmingham Society is able to point to is not due either to the need or the value of the work which it has taken in hand, but rather to the spirit of enterprise and energy which pervades that excellent Society, and which is calculated to carry it through all its undertakings, of whatever nature. But we are not sure that a little local enthusiasm over the innumerable opportunities for taking pictures of ancient houses and other objects in Warwickshire is likely to be contagious in parts of the country where such natural advantages do not prevail. This, we fear, foredooms Mr. Harrison's idea to remain permanently in the suggestive stage.

While we admire Mr. Harrison's enthusiasm in the pursuit of that idea as well as feel ourselves in a complimentary mood towards him when contemplating the mass of figures and details bearing on the subject which he brought before us the other night, it would be absurd to regard the scheme of a concerted "photo-survey" by the Societies of the United Kingdom as other than impracticable, unwieldy, of doubtful utility, of problematical longevity in its execution, and of debatable practical value when (if ever) finished. The suggestion with a purely local application looks and reads well on paper. Extended to the British Isles, it would, or should, mean millions of photographs which even the Photographic Society of Great Britain with its newly found energy might hesitate to take charge of. They would require a National Gallery for storage, and a Government bureau for their administration. Conceive such a scheme really started, and divided and subdivided among the various participants in the work, it is difficult enough, in all conscience, for them to know where to begin; but where should they leave off? Where is the line to be drawn between that which is worthy of recording by means of photographs and that which is not; and, above all, who is to draw it? If the picturesque, the antiquated, and the interesting is to be preserved on paper for the historian of remote centuries, why not the unlovely and the unpicturesque, since both equally go to the making of history?

On the whole, while we commend local survey or record work, as calculated to infuse a new motive for existence into the lives of the ever-increasing photographic societies, we are not sanguine that any universal or concerted scheme stands but the remotest chances of success; and therefore, on those grounds, it is to be hoped no such scheme will take shape. As in the case of the proposed photo-technological institute, we demur to the theory that Government aid should be solicited or expected. Such a demand would inevitably meet with failure. The Government, we fear, would take up the attitude of many individuals, and say that, while it is an admirable idea to place a great many features of modern architectural beauty and topographical interest on record, there are many things in existence nowadays which are unworthy that honour, and which posterity would not thank us for preserving, and a possible permanent record of which we ourselves cannot contemplate without a shudder. In future ages, we of this epoch no doubt will be heartily laughed at for many monstrosities, including the "German cooking-stove, with the griffin on the top" of the London City Corporation in Fleet-street, our ugly public buildings and railway bridges, and

so forth. Would, indeed, that all records, photographic and otherwise, of such monstrosities might be for ever obliterated! Alas that Mr. Jerome Harrison should wish it otherwise!

Fused Silver Nitrate and Sensitiveness.—In a letter in another part of the JOURNAL, Mr. J. Barker, *apropos* of a discussion which took place at the last meeting of the London and Provincial Photographic Association, points out that, if two gelatino-bromo-iodide emulsions be made identical in every respect, except that ordinary commercial silver nitrate is used in one case and fused silver nitrate in the other, the latter emulsion will be more sensitive than the former. This is a fact which we are able to confirm, although we are unable to explain it, but we do not think it is taken advantage of in commercial plate-making.

Trade Marks Act.—This Act has certainly stimulated photo-mechanical work in this country. Before the Act was passed, some firms who professed to do photo-mechanical printing themselves actually had it executed abroad, and their own name put upon it. Now, if this were done, the prints would be liable to arrest at the Custom House, unless they bore on the imprint the intimation that they were produced abroad. The consequence is that some houses who used to get their orders executed on the Continent have either to work the processes themselves, or decline to accept the orders, except, as is sometimes the case, they get other houses here to supply the work. It is, perhaps, on the score of photo-mechanical work more than in anything else that the home photographic industry has benefited under the Trade Marks Act.

Photography and Technics.—*Apropos* of photographic surveys and records, the Brechin Society has struck out in a somewhat novel direction, that of getting together a collection of photographs, in the form of lantern slides, illustrative of the staple manufactures of these districts. This set of slides, if accompanied by an explanatory lecture, as mentioned, would prove highly interesting if loaned to other societies. What the Brechin Society is doing other societies could also do in the staple industries of those localities. There is scarcely any branch of manufacture from which not only interesting, but instructive, photographs could be obtained. Possibly this may be done, independently of photographic societies, by the proposed Technical School. In reference to this subject, one thing occurs to us: some manufacturers who have gone to great expense in perfecting their appliances may object to their being photographed, and the photographs being so widely exhibited.

Xylonite or Celluloid in Photography.—It will be remembered that some year or two ago we directed attention to xylonite as a basis for photographs in imitation of ivory, and suggested the carbon process for the purpose to those in search of novelties. Soon afterwards we were shown some prints on it produced by a photo-mechanical process, apparently from an intaglio plate, that were very fine indeed. These were produced in America. We were recently shown some on the same material, also printed in the States, but from "process blocks," that were almost equally as good. From Germany also we have seen some very good process block prints on celluloid in imitation of ivory. This compound, under its different names, is now finding many uses in connexion with photography. Why cannot it be as well used for printing upon by collotype as for intaglio plates and typographic blocks? Collotype on it would make excellent pictures as Christmas cards and the like. One of the difficulties, we believe, in printing on celluloid is that of getting the ink to dry so that it does not rub off. Ink that will dry on paper in an hour or two will not be sufficiently dry, so as not to rub off, in as many weeks. In this matter the Americans have been the most successful. Why?

Insurance Rates.—The recent conflagration at Messrs. A. & G. Taylor's calls to mind that fires in photographic establishments are far less frequent now than they used to be some years ago. At one time the insurance offices had numerous and heavy calls upon photographers' policies; but, with one or two exceptions, the cause of the fire could in no way be attributed to the inflammable materials used in the business—collodion, &c. However, the frequency of the claims some twenty years or so ago induced the insurance companies to raise their premiums very materially, the cause then assigned being the combustible materials employed. Some offices still adhere to the old rates, and many photographers are paying them. At the present time, in the majority of studios, no inflammable substances are used; therefore the risk is no greater than in any other business. Again, a claim on a photographer's policy has seldom now to be made. Why, then, should the old rates be sustained? However, some offices have reduced their rates, and we know that others have done so in individual cases when they have been protested against and the names of other offices mentioned. Insurers should bear this in mind when the next premium becomes due. By the way, Fire Insurance was one of the subjects that the National Association of Professional Photographers were to take in hand.

Cleaning Daguerreotypes.—Referring to the subject of the Daguerreotype process in our last issue, it was mentioned that this was—and for that matter is—the most permanent of all silver processes. A Daguerreotype may become so tarnished that the image is obliterated. But if the picture were gilded, as described, we have only to remove the tarnish to restore it to its original condition. This professional photographers are frequently called upon to do, and, although they succeed in cleaning the picture, they do not, in all cases, restore it to its original brilliant state. It is sometimes veiled, or has marks upon it when finished. The reason is this: after the picture has been treated with the solution of cyanide of potassium, sufficient care is not bestowed on the washing and drying. The picture, after being well washed under the tap, must be carefully washed with distilled water, and then, before the water has time to collect in tears, the flame of a spirit lamp is applied to the uppermost corner of the plate while held in a slanting position, and then gently applied to the other portions. If veiling or drying marks are to be avoided in "restoring" Daguerreotypes, *pure* water must be used for the final washing, and the drying effected without a check, as was explained last week and well known to all who have worked the Daguerreotype process.

Photography in the Colours of Nature.—On Tuesday afternoon last Mr. F. E. Ives delivered the first of two lectures on this subject, before a large and interested audience, at the Royal Institution. The following is a synopsis of the lecture: Origin of the idea of colour photography by a composite process—History of composite heliochromy—Ducos Du-Hauron's process—Cros' process—Poirée's process—Dr. Vogel's discovery of colour sensitisers—Improvements following Dr. Vogel's discovery—Dr. Albert's chromo-collotype—Dr. Stolze's original suggestions—The Young-Helmholtz theory of colour vision—Maxwell's measurements of the power of different spectrum rays to excite the respective fundamental colour sensations—Definite application of the Young-Helmholtz-Maxwell theory in composite heliochromy. On this occasion only one picture was exhibited on the screen, the subject being that of a girl with rustic surroundings. The colours of the picture were most vividly and faithfully rendered. Our readers have already been made familiar with the principles and details underlying Mr. Ives' method. The second lecture will be given on Tuesday next, May 17. In our correspondence columns this week appears a letter from Dr. H. W. Vogel in reference to some points raised by Mr. Ives in his address to the Franklin Institute last year.

COLLODION EMULSION NOTES.*

It was remarked, at the London and Provincial meeting, that I had stated that precipitated emulsions do not keep; but, so far as my recollection goes, that is scarcely accurate. Speaking entirely from memory of some years since, I found Chardon's emulsion to keep admirably, at any rate, for some months, and, if anything, to improve

* Concluded from page 294.

in clearness and quality of image. But the undeveloped image on the exposed plate had absolutely no permanence, and commenced to fade out in a very few hours, as I once found to my cost. I went away for a fortnight into North Wales, taking with me a stock of clean glass and Chardon's emulsion, coating my plates each evening in my bedroom, and developing one or two of those exposed. The negatives developed on the spot were all that could be desired, some of them as near perfect as photographic work could make them; but of several dozen exposed plates I took home with me I did not get a single good negative, except those exposed on the last two days of my holiday. The trouble was *under-exposure* apparently in every instance, but that this could not be the case was proved by one plate exposed on my first day out, and which was fortunate enough to get about three-quarters of an hour's exposure in sunshine while I was chatting with a fellow amateur who "chanced along," thinking I had closed the lens. Now, three-quarters of an hour was usually quite enough in those days even for a slow plate, but this one refused to show any detail in the distance some miles away.

The fault was unmistakably in the film itself, and arose from the presence of something which destroyed the image almost as soon as formed. It could not be excess of soluble haloid salts, because although Chardon's emulsion contained before precipitation excess of chloride of cobalt, that and all soluble matter was bound to be removed in the operation of washing, which was very thorough. And besides, had that been the cause, the plates would have been too insensitive to make a picture, even if developed at once. The real cause I set down, and I still believe correctly, to the decomposition of the precipitated pyroxyline itself, which, by liberating nitrous emanations destroyed the image. The action on the emulsion would only be to keep it clear and free from fog, and perhaps very gradually to render it thinner and more fluent. The latter, however, I never kept it long enough to try.

After all, there is no better plan of washing than the original one of pouring out into a thin layer, drying very thoroughly, or until all the solvents are gone, and then careful washing in hot water if you like. In this we adhere as closely as possible to the treatment of an individual film when treated singly; the soluble matters are thoroughly eliminated while the pyroxyline itself is sufficiently firmly set to resist any action of the water. Under such treatment alone can the retention of the original qualities of the unwashed emulsion be relied upon in the washed product. For small quantities, say, five or ten ounces, such as an amateur is likely to "tackle" at once, there need be not the slightest difficulty in any stage of the work. A twelve by ten plate formed into a dish by glueing strips of paper round the edges, when placed upon a level surface forms an admirable evaporator for half a pint of emulsion, which will be set perfectly hard in twenty-four hours or less without artificial aid. The leathery skin thus formed is torn up into small fragments and soaked for half an hour or an hour in cold water, and may then be passed through half a dozen changes of hot or even boiling water, after which there is not much danger of any bromide being left in it.

The drying is found by many to be the most difficult part of the process, hence they resort to all sorts of expedients, such as only half drying by pressure, or by soaking in alcohol. More harm and uncertainty arise from such expedients than from anything else. Apart from the fact that a half-dried pellicle sometimes refuses to dissolve at all, the introduction in this manner of water into the emulsion is chiefly instrumental in causing half the troubles we hear about in the way of streaks, mottling, and crapiness. One of the chief beauties of a washed emulsion should be its freedom from structure, due in great measure to its being made with strong solvents. Let the pellicle then be dried thoroughly until hard and crisp. If it takes a little longer to dissolve, the result is far superior. After pressing out as much of the moisture as possible by *gentle* pressure between blotting paper, lay the pellicle upon a sheet of clean paper in one of the cardboard boxes used for packing plates, and carry it to the kitchen oven, which should not be too hot. The box provides protection from light and sufficient exit for steam and moisture, and the contents can be examined in the dark room from time to time until dry.

For those who hanker after the sort of state of division given by precipitation, the following plan will answer admirably, possessing the good points of that method without its uncertainty; but it is rather troublesome, and not altogether pleasant, if you do not like ether fumes. Pour the emulsion into a *basin*, and allow it to evaporate for some hours, with occasional stirring, or until it begins to clot. Then, in the dark room, proceed to stir it vigorously with a silver fork or spatula, exposing it to the atmosphere as much as possible to draw off the solvents. If an artificial blowing arrangement is handy, so much the better. At first the mass only gets thicker and lumpier, but after a while, when all the ether is about gone, it forms almost suddenly into fine shreds, from which a clear liquor—alcohol and water with the soluble salts—separates. Continue the stirring until the solid portion clots firmly together, then pour off the liquor, press out the surplus and leave the solid emulsion spread round the sides of the basin for half an hour; then stir it into cold water, wash, pour off, and repeat a few times, and finally squeeze as dry as possible in a cloth before scattering the fine filaments over the bottom of the drying box, as already described.

This method reduces the emulsion to the very finest possible condition for washing, drying, and redissolving; but it is troublesome, except on a small scale, or on a very large one with suitable machinery and appointments.

W. B. Bolton.

THE CAMERA AND THE CONVENTION; OR, PICTURESQUE SCOTLAND AND PHOTOGRAPHY.

II.

Going round the Queen's Drive from St. Leonard's Gate there is, on the face of the hill to the left, a peculiar formation of rock, called "Sampson's Ribs;" this spot may be of interest to the photographer of a geological turn of mind. The range is of porphyritic greenstone columns, of a pentagonal or hexagonal form, from fifty to sixty feet in length, and five feet in diameter.

Craigmillar Castle.

Duddingston—this village is situated at the back of Arthur's Seat when viewing it from the city, and it will be found a most delightful place for the exposure of a few plates. The village itself is one of those old, sleepy, contented-looking places that never seem to grow, with the placid rocks at its foot, and the old church on a promontory standing high up over the loch. The whole surroundings lend themselves to the making of good pictures, and the swans on the lock give an opportunity for some good instantaneous work. From this spot Craigmillar Castle is at quite a convenient distance. This was the old castle at which the Convention group was taken by Mr. Crooke when the Glasgow meeting visited Edinburgh to spend the day with their friends there. Those who have seen Mr. Crooke's picture must feel that it is the best and most picturesque group that has ever been taken at any convention. Craigmillar Castle is well worthy of a visit, specially to those who delight in ruins of historical interest, the place being so closely associated with Mary Queen of Scots. Over the hill to the south of the Castle, there is a clachan called "Little France," where Queen Mary's stables were located when she resided at Craigmillar. This little bit composes well for a picture.

Newhaven and Portobello.

Leaving the south side, and coming down to the Forth, about two and a half miles north from Edinburgh, lies Newhaven, where is to be found the Newhaven fishwife, that toiler of the sea, whose unique dress and original appearance are known all the world over.

Newhaven is a small fishing village, composed of old houses, outside stairs, and awkward gable ends, which help so much to make a picture, the inhabitants themselves being a distinct community from all around. The men are mostly all fishermen, and the females fishwomen. The place possesses a trig little harbour, and lots of fishing-boats about usually, so that the combined materials for making good pictures of this class will be found here easier and better than at any other place along the coast.

About two miles to the east of Newhaven lies Leith, but it is of no account photographically, except the docks, perhaps, where some good shipping effects may be had; and for water pictures we have seen some successful negatives taken at the end of the pier, which runs out about a mile. With a fairly good sea on, and the ships caught making for the entrance between the piers, fine effects are got.

Keeping along the coast for about two miles, we come to Portobello, which may be termed the Brighton of Edinburgh. In the summer-time the sands here will be found quite a happy hunting-ground for the snap-shot and hand-camera operators, and there is usually a pretty large

contingent of these at the Convention meeting. Why, at one of the trips at Bath we remember, out of a gathering of some thirty or forty, the whole company had hand cameras, with the exception of three.

Three miles further on we come to Fisher Row and Musselburgh. We have got, in days gone by, some good studies at the Fisher Row end of Musselburgh. The river Esk, which runs through the town, possesses some artistic points away above the bridge, but Musselburgh, taken altogether, is not of great interest to the photographer.

Roslin Chapel and Castle.

Roslin, a hamlet about eight miles south from Edinburgh, is a charming spot for a day's outing, possessing, as it does, a chapel, a castle, and a glen, all within a small radius. The chapel is well known, and is one of the favourite resorts of all tourists to Edinburgh. It is a highly decorated specimen of Gothic architecture, and in the interior of this chapel is to be found the "Prentice's Pillar," a marvel in sculptured foliage, and about which the keeper tells the following story :—

"The master-builder of the chapel, being unable to execute the design of this pillar from the plans in his possession, proceeded to Rome, to study a similar column there. During his absence his apprentice proceeded with the execution of the design, and upon the master's return he found this finely ornamented column completed. Stung with envy at this proof of the superior ability of his apprentice, he struck him a blow with his mallet, and killed him on the spot."

The castle stands on a rock overhanging the picturesque glen of the Esk, with surroundings of foliage, and rock, and bubbling stream—the very centre of a happy hunting-ground for the camera men.

All the way to Lasswade, by the banks of the Esk, is full and rich with pictures. Hawthornden, the seat of Drummond the poet, is also on this road, and close to the glen.

About two miles from Lasswade is Dalkeith, the seat of the Duke of Buccleuch. The palace and gardens command notice both for their beauty and historical interest.

Peebles and North Berwick.

Peebles, about twenty-seven miles from Edinburgh, situated on the banks of the Tweed, is a good district, but not so condensed and easily handled as Roslin. It is surrounded by gentlemen's seats of great beauty. Nidpath—one of the old defence castles—is only a mile from the town and very romantically situated.

North Berwick, twenty-two miles from Edinburgh, on the east coast, is a small seaport and coastguard station, with surroundings that suit the seeker after picturesque scenery. The town itself is famed for its Law and Links, neither of which are of much moment from a photographic point of view. North Berwick Law is a conical hill over 600 feet high, standing out all by itself, and which can be distinctly seen from Edinburgh. The Links are held in high esteem by golf players. As a summer residence North Berwick is much in demand. To the east of the town, and keeping to the shore, lots of good rock and seascape pictures are to be had, with the Bass Rock in the distance. The Bass Rock lies out about two miles from this point. About two miles along the shore we come to Canty Bay, which is worth a plate or two, but beyond this is Tantallon Castle, a most imposing subject, towering in rugged grandeur to the sky. When the tide is out, photographing from various points is easy. Tantallon is easy of access also from the high road, and the ruins would delight many. About two miles to the west of North Berwick is Dirleton, a neat little village with beautiful gardens, where good work will be found, and Dunbar Castle is about nine miles from here.

Melrose, Abbotsford, and Dryburgh.

Melrose, Abbotsford, and Dryburgh are places of absorbing interest to all who have read Sir Walter Scott's works, and who has not? The distance from Edinburgh to Melrose is thirty-seven miles, and at Melrose the Abbey is the point of greatest interest. It has been photographed so often, in general view and in parts, that it must be familiar to all, and those who only know it by pictures and reports must have a great desire to visit it, and make pictures of it for themselves.

Abbotsford, the romantic home of Sir Walter Scott, is three miles from Melrose, the way thither being filled with places of interest. The house itself, standing on a promontory quite close to the Tweed, makes a charming picture. A wealth of both interior and exterior work is to be found here. From here we go on to the spot where Sir Walter Scott is buried—Dryburgh Abbey. This Abbey is five miles from Melrose, and there, in St. Mary's Aisle, is the last resting-place of the Wizard of the North.

To do this part of the country justice it would take a week or two; for miles around wood and water scenery abound, picturesque beyond description; and within an easy railway journey is Jedburgh Abbey and Kelso Abbey, and every mile of the way contains places of beauty and interest.

The Forth Bridge!

The Forth Bridge is an object of considerable interest to the visitor to Edinburgh, and it comes naturally within the range of one of the places that must be done; an engineering feat of such magnitude appeals to many from the mechanical point of view, but by far the greater number go to look upon it as a sight worth seeing, only that and nothing more. In driving to the Forth Bridge, about half way out we come to Cramond Bridge, under which the river Almond flows. In this vicinity some good studies are to be got.

The grounds of Dalmeny Park is the next place of note upon the way. This is the seat of the Earl of Rosebery. The last time we visited the Forth Bridge, we wanted to take some pictures in these grounds, but were not allowed to do so. We had perfect liberty to walk through them, but no liberty to photograph.

The Forth Bridge itself must be photographed: interesting, yes; but there is nothing pretty about it.

Dunfermline and St. Andrews.

Taking the train at the bridge, half an hour's journey brings us to Dunfermline, where stands an abbey of considerable historical interest. Robert the Bruce is interred here, besides many other kings and queens. The last time we were at this abbey the keeper showed us a very peculiar effect in the construction of the pillars. The carved work round them, which twines to the top, has the effect of deceiving the eye, and makes the pillars look ever so much narrower at the top than the base when viewed from a given point, and by changing your position quite the contrary effect is produced, seeming broad at the top and narrow at the base, and when coming near they are quite symmetrical. If there, you should ask to see this.

The town itself does not possess any beauty for the photographic visitor, but some of the gentlemen's seats around are historically interesting. There's Cutross Abbey, the old seat of the Bruce family, and the scene of the murder of Lady Macduff and her children, Dunemarle Castle.

St. Andrews is about an hour's journey north-east from Dunfermline, and here stands a good day's work ready for the enthusiasts, with its cathedral, its castle, and its colleges, besides other buildings of note, a romantic shore, and renowned golf rinks, a choice of work to suit the varied inclinations. St. Andrews is about forty-four miles from Edinburgh.

Around Edinburgh, within an easy distance of the city, not going beyond the "Braids" or the "Pentlands," many charming spots for photography are to be found, but we anticipate the demand will be for spots of a more pronounced nature, with a tradition, a story, and a beauty, and at a further distance from the immediate vicinity of the city. We give these in more detail.

JOTTINGS.

Not long ago I was present at a meeting of a photographic society, and the discussion turned upon the difference between ordinary nitrate of silver and the "recrystallised" salt. One member said that the only difference between the two salts was, that in the latter case the large crystals were selected from the ordinary stock, and these, *ipso facto*, became "recrystallised" silver nitrate, which was consequently sold at a higher price. In the course of a somewhat long and varied career in photography, I am enabled to state that the process of recrystallisation here indicated is the one almost generally adopted; indeed, I may say that it has been frequently my duty to carry it out practically, to the monetary confusion of a host of too-credulous purchasers, and the enrichment of my sharp-practising principals. Hence, when I see recrystallised silver mentioned in a collodion or any other formula, I smile.

That a monument to Petzval, the great mathematician, whose calculations and formulæ for photographic lenses are as valuable to-day as they were fifty years ago, is an undertaking in which all photographers and opticians might worthily join, admits of no denial. The fact that such a project is afoot is recorded in one of your contemporaries last week—but, alas! from my file of the British, I see that it was noted and commented upon in your Journal several months ago. Verily, news travels i a circle! The funniest part o

the matter is that the paper which gives this old and crusted par. as an item of "news" is never tired of publishing its refusal to print anything which has appeared in the other photographic papers. I could give you dozens of instances in illustration of this irony of fate.

Just as there are still among us adherents of the Stuart dynasty, so it seems there are those whose affection for the wet-collodion process "age cannot wither, nor custom stale." I fear, however, that the process is more talked and written of than practised, except among a very few process workers. Why even these gentlemen still adhere to it I cannot imagine, as sufficient density and clearness of line for all purposes are, as the examples I have often seen convince me, not abnormally difficult to get on gelatine plates by the exercise of a moderate amount of skill and care. But there is one thing, by the way, in which the wet plate-process possesses a distinct advantage in working over gelatine plates, which is seldom noticed in the papers and articles dealing with the subject nowadays, and that is, the extreme rapidity with which the developed negative is fixed, compared with a dry-plate negative. I was forcibly reminded of this the other day when taking some outdoor pictures for an old wet-plate worker who was waiting outside the dark room to see the results. The pictures were under-exposed, and they each also took at least a quarter of an hour to fix, a circumstance which led him into various unfavourable comparisons of the two processes, to the disadvantage of the new one. Modern gelatine plates vary much in the rapidity of solution of the unaltered salts in the fixing bath.

I have no doubt it was an amusing night at the South London Photographic Society when the President made a handsome addition to the funds of the Society by selling the new cold-bath platinum pictures he had developed in the course of his demonstration of that process; but I confess that to me the incident would have looked "better rounded off" if the Society had not profited by the transaction, and the money had been handed over, say, to the Photographers Benevolent Association. I thought that photographic societies existed for the advancement of photography, and not as money-making concerns. I see that another Society lately held an auction of members' old apparatus, and I have heard of one which has varied the monotony of its proceedings by indulging in the wild delights of a raffle. All this is very entertaining, but it is slightly indecorous, and is, I think, calculated to make the judicious grieve. At any rate, the publication of these sales by auction, and otherwise, is out of place in a Society's report, which, if primarily intended for the information of members, is also, I conceive, meant for the enlightenment of outsiders, or why do secretaries take advantage of your benevolent pages?

I was much pleased with Mr. Frederick Park's generally lucid paper on *Bromide Enlarging*, read before the Newcastle-on-Tyne Association; but I think a little more clearness on certain points would not have been amiss. For example, he says he usually takes his negatives for enlarging with stop *f*-32, but he omits to tell us the focal length of his lens, so that the information on the point is, to say the least of it, incomplete. Again, when he says that with a large stop more light strikes the centre of the plate than the edges—and consequently that density is greatest at the centre—he is, I think, making a statement which is possibly open to serious objection if it is to have a general application. May I ask him what he calls a "a large stop," and also to indicate the precise aperture to employ so as to combine the equality of illumination he desiderates with freedom from excessive central density, which he tells us occurs with a "large stop?"

I observe that, in the regulations of the exhibition of photographs and apparatus to be held next week at Bath in connexion with the Floral Art and Industrial Exhibition, "contributors will be allowed to affix name and title to their works, and, *if professional*, the price" (my italics). Now, sir, why "if professional?" Am I to understand that a poor wretch of an amateur will not be allowed to sell his pictures—in other words, may not become a professional at will? or does Mr. W. M. Ashman, in an excess of innocence, imagine that no amateur could, would, or ought to sell his pictures if opportunity arises? This a free country, and long may it remain so, even though professional photography be thereby ruined,—

> "Let laws and learning, arts and commerce die,
> But spare us still the amateur, say I."

Excuse the parody, sir. [We do, although it is a poor one.—Ed.] But the sentiment is widely entertained. Stay, perhaps Mr. Ashman contemplates starting an association for the protection of the poor professional against the avaricious amateur? Good luck to it.

Cosmos.

ON THE PRESERVATION AND DETERIORATION OF GELATINE NEGATIVES.

III.

Of the many fruitful sources of deterioration of gelatine negatives perhaps there is none more insidious than the sudden changes of temperature and accompanying humidity of atmosphere frequently met with in the early spring and late autumn months of the year. During the month of March we have had notable instances of such weather, when, with the thermometer standing at 70° in the forenoon, it has fallen suddenly, and during the night so low a reading as 5° of frost has been registered, this being again followed by rain and dampness of atmosphere, so much so that walls of staircases in the interior of houses were running down with damp. It is at such times as these, more than any other, that sad havoc is played with gelatine negatives, and, therefore, every precaution should be taken to guard all valuable negatives that may be in printing, or even stored away in places liable to contract damp.

Let any one anxious to experiment in the amount of moisture that a gelatine negative will absorb from a damp atmosphere just try the result of placing a perfectly dry film, varnished or unvarnished, after the same is carefully weighed, into a damp washing-house for forty-eight hours, and then weigh again; or, if the more simple method of holding the damp plate before a fire be adopted, he will be surprised at the amount of vapour that will be thrown off. It very frequently happens that negatives in this condition are, without any thought, dragged out from some cupboard, or other strange place of doubtful suitability, and hurriedly placed in a printing frame, just to throw off a print or two, when, should the temperature be somewhat higher, and the atmosphere in a tolerably dry state, there is no outlet for the condensed moisture which is sure to arise within the film, the result being the formation of minute spots, which in course of time play sad havoc by becoming so pronounced as to spoil the negative entirely. At the time these spots will not be visible, but if such a negative be carefully examined when in the printing frame, it is more than likely this evil will be detected. When this condensation is going on, small circles of prismatic colours may be noticed when looking down on the glass side of the negative. Sometimes they will be seen in numbers of two or three close together. When such are noticed the evil has begun, and before long, in the exact place where these tiny prismatic circles were seen, distinct spots will be found to have put in an appearance in the film. This can be easily proved by carefully marking the place where these prismatic circles are seen.

When such spots are examined with the aid of a microscope—using, say, an inch power—they will be found to present totally different appearances according to the manner in which they are viewed. When examined on the film side, they will show no colour circles; but when they are looked at on the glass side of the negative, they are found to present one of the most beautiful objects any one can view under a microscope. The spots will be seen to be caused by perfect circles of varying tints, and in nearly every case the exact centre will show the fine granular deposit of metallic silver undisturbed, but around which the most perfect circles of varying colours and widths will be seen to have formed deep down in the film, as it were, against the glass, and these circles, it seems, go on increasing as the spots get larger. For a long time I was puzzled to account for these prismatic circles, but I have clearly traced them to the condensation of moisture in the gelatine film, caused by bringing a negative in a damp condition into a heated atmosphere without any precautions being taken to gently assimilate such to the existing temperature. All valuable negatives that have been stored away ought to be gently warmed before being put into a printing frame to print.

Another insidious source of damage to gelatine films will be found in the common practice of placing a number of negatives in a packet film side to glass side, or, in other words, film side all turned inwards, without any thought being given to the contaminations which the glass side of a negative may have contracted from dirty fingers or other injurious sources. This is very likely to happen when

frames are hurriedly emptied and the negatives placed away on end, as described.

Intimately associated with the deterioration of negatives is the question of their proper storage, and perhaps there is no better method to adopt than that followed in large establishments, where they are placed away in racks with a constant current of dry air passing through them. Of course, to the great army of amateurs such precautions are not to be thought of, and the more common practice of placing the negatives in paper envelopes is adopted; but such is by no means a safe practice to follow, for when such are stored away in a damp cupboard or other unsuitable place this form of protection is just about the worst possible. Far better is the plan of employing grooved boxes, and when such boxes are placed in a dry situation the risk is reduced to a minimum; but it is always wise to gently assimilate the negative to the existing temperature before placing same in the printing frame.

Luckily we are not left in much doubt as to when a varnished or unvarnished film has contracted damp from the atmosphere. Should the precaution that I have referred to not have been taken, but, on the other hand, the printing paper be merely placed in contact with the damp film, it will not be long before the paper will begin to show signs of puckering up by the absorption of the damp from the gelatine, which causes it to expand just as if a damp sponge were drawn across a dry sheet of printing paper. When such takes place there is great danger of deterioration in the future. T. N. Armstrong.

SOME CONDITIONS INFLUENCING THE WELFARE OF PHOTOGRAPHIC SOCIETIES.

[Brixton and Clapham Camera Club.]

In thanking you for the honour of having elected me a Vice-President of this Club, compliance is necessary with the request of your Hon. Secretary, that an address shall be delivered to you this evening in place of a paper by any of the members. To a person of few words the fulfilment of such a duty is not always easy; so, after placing before you a few ideas as to some conditions influencing the welfare of photographic organizations, the remainder of this evening will be spent in viewing a display upon the screen, by Mr. Levitt, of the lantern pictures taken by Mr. Leon Warnerke, of Government and other photographic establishments in Continental Europe. Mr. Warnerke has left England for St. Petersburg, so is unable to be present here to-night.

A photographic organization may be prosperous in its intellectual capacity, or it may be prosperous in its funds and the number of its members; it may also be prosperous in both. When it is but materially rich, a local society may go quietly and comfortably on its way, and be little esteemed outside the limits of its own parish; when, however, its intellectual powers add considerably to the progress of photographic art and science, its discoveries attract the attention of the world.

That a local society should raise itself above the dead level of the general run of such organizations, it is necessary that each individual member, when time and opportunities permit, should take up some special work, and afterwards place the results before the whole body of the members. In reading the records of the average proceedings of local photographic societies, one would suppose that none but silver and a few other processes existed, and that we have nothing to talk about at our meetings but the working of common processes connected with the plates, films, and papers ordinarily sold in commerce. What is wanted is, that one member shall say, "I will carry on novel photographic researches with the salts of iron;" that another shall resolve to do the same with uranium salts; that others shall experiment with the salts of nickel, cobalt, and other metals; that one member shall take up the primuline process, and discover its possibilities, and so on, so as to get away from the more common processes, and to discover new things about the others. We should also have men quitting the beaten track in matters artistic; the finest artistic effects in photographic printing are, I think, produced by Klic's—better known as the "photogravure"—process; yet, where is the amateur who works the same? Dr. Emerson announced his intention of beginning to work at it, but I have not yet heard of the results.

I do not believe in appointing committees to conduct such investigations from a pious sense of duty and a mere belief that the work ought to be done. It is for the individual to strike out new paths, not as a task but as a pleasure. It is for each of our younger members to resolve to no longer live as a nonentity, but to do something to increase the store of human knowledge, and to stand out as a benefactor of the race.

What dreary reading is to be found in the local society reports in the photographic press! We are, perhaps, informed therein that Mr. Jones sat down amid loud applause, after reading a valuable paper—in which the reporter can find nothing worth printing. Sometimes we are told how J. Smith, Esq., J.P.—a man knowing nothing of photography—honoured the Photographic Society of Little Pedlington with his presence, and how all the members grovelled before him. I think that the editors of all the photographic papers will thank me for speaking of the lack of general interest and of useful information in the average reports of the local societies. They cannot well leave the reports out, because their circulation might then fall in the various localities. Let, then, some of the energetic young men connected with this club bring in some results of original research, and make the reports of our proceedings worth reading. The club has the advantage of possessing as president a physician of high attainments, who can appreciate the value of original research by the members, and who himself does not much follow beaten tracks in photography; a president who does not feel satisfied unless he can set up his camera in the crater of an active volcano, such as Hecla, is sure to encourage all those members who begin to strike out new paths of experimental investigation.

One of the largest and most prosperous local photographic societies in the kingdom is the Manchester Amateur Photographic Association, and I was told at one of its meetings, by one of its most active members, that lantern displays and lectures, to which the public were admitted for a trifling fee, had great influence in bringing in new members and increasing its popularity. Close at hand we have a busy centre of traffic and commerce, and, if next winter we advertised lantern entertainments for the display of instantaneous photographs of scenes near Brixton Station, they would probably "draw," as, apart from other considerations, so many persons would be curious as to whether they or their houses had been pictured.

A good library furnishes an inducement to join a photographic society. The Camera Club has a good library, and the Photographic Club a moderately good one; those of all the other photographic societies of London are, so far as I know, poor in the extreme. Perhaps we shall be long before possessing a good library, but the central free library is now being built close by the spot on which we are now assembled. It might be well if this Club memorialised the authorities thereof to the effect that the collections of chemical and photographic books they have already placed in the branch libraries are so poor as to be beneath contempt, and that they may as well possess one decent collection of scientific works and books of reference, so that people shall not be obliged to journey hence to the British Museum or the Patent Office Libraries because of the literary poverty of our own locality.

A good hon. secretary is essential to the welfare of every photographic society; he is to the society what the lens is to the camera; he is the official means of communication with the outside world; and, if he be intellectually dim, woeful will be the results to the organization he represents. He has to do all the hard work, and is forgotten while everything goes on well; when things begin to go wrongly, he has to bear all the abuse. When you smite him on the one cheek, he has to turn to you the other also; and, when the money balance of the society is on the wrong side, he has to cheerfully make up the deficiency out of his own pocket. We cannot too much honour such laborious and long-suffering individuals. I think that it is the duty of the wealthier members of the photographic community in London to "dine" all the photographic hon. secretaries once a month. Had Mr. Louis M. Biden adopted this plan before he attempted to federate all the London photographic societies in hot haste, he might have been more successful in carrying out his plans. One stands appalled at the magnitude of the knowledge of the public aspects of photography in London, which would be concentrated at a dinner party of the secretaries of the various organizations.

Exhibitions, summer outings, and other incidents of existence have their influence on the welfare of photographic organizations; but enough has been said upon this subject for one evening, and we will now give attention to Mr. Warnerke's lantern slides.

W. H. Harrison.

THE WET COLLODION PROCESS.

[London and Provincial Photographic Association.]

In response to the request of our Secretary to "tell us something about the wet-plate process," I have embodied a few jottings from my note-book in the form of a short paper, in the hope that they may be found useful to those of our members who may be desirous of working the wet-plate process. This is comparatively an easy affair now, seeing the facilities that present workers have for obtaining any article required, which is a very different state of affairs from that which prevailed in

olden times, and, as each of the materials used had a decided effect upon the other, the difficulties of the old worker were often great, it being absolutely necessary, if first-class work was required, that suitable samples, which would work together, should be obtained. For instance, if the alcohol was weak, it would not dissolve some samples of cotton, and the addition of an extra quantity of ether, to compensate for the weakness of the alcohol, did not mend matters much, as, although it would then, perhaps, dissolve enough cotton, the resultant film was usually crapy, porous, and rotten; acid ether would also liberate iodine, and rapidly disorganize the collodion, and, unless the pyroxyline was suitable for the purpose intended, first-class results were hopeless.

It was also necessary to suit the iodiser to the cotton, or *vice versâ*, as a sample of cotton that was almost useless with cadmium could be made to give a passable result with ammonium and sodium, though many little dodges could—and, in fact, had to be—resorted to, such as adding a trace of carbonate of soda or ammonia when the pyroxyline was tough and horny, and the addition of a few drops of tincture of iodine if the collodion was too new, and that general panacea for wet-plate woes, the addition of a little more acid to the bath.

I will pass round a few specimens of old positives and negatives, calling your attention specially to the positives, which, although taken many years since, still retain the characteristics for which this process was noted, and which, I submit, have never been excelled, and will conclude with a few formulæ that I have found to work well in my own practice.

FOR RAPID WORK.

Bath.

Fused nitrate of silver	50 grains.
Rain or distilled water	1 ounce.

Should be quite neutral, or faintly acid with acetic acid.

Collodion.

Alcohol, ·805	½ ounce.
Ether, ·725	½ ,,
Iodide of potassium	3 grains.
Iodide of Cadmium	3 ,,
Bromide of potassium	1 grain.
Bromide of cadmium	2 grains.
Pyroxyline	7 grains.

Developers.

No. 1.

Protosulphate of iron	30 grains.
Formic acid	10 ,,
Glacial acetic acid	½ drachm.
Alcohol	1 ,,
Rain, or distilled water	1 ounce.

No. 2.

Protosulphate of iron	240 grains.
Acetate of copper	10 ,,
Glacial acetic acid	3½ drachms.
Alcohol	3½ ,,
Rain, or distilled water	8 ounces.

Intensifier.

Pyrogallic acid	4 grains.
Citric acid	12 ,,
Rain, or distilled water	1 ounce.

Add a few drops of silver from nitrate bath as required.

Fixing.

No. 1.

Cyanide of potassium	¼ ounce.
Water	10 ounces.

No. 2.

Hyposulphite of soda	1 ounce.
Water	5 ounces.

FOR ORDINARY WORK.

Collodion.

Alcohol, ·805	½ ounce.
Ether, ·725	½ ,,
Iodide of cadmium	2 grains.
Iodide of ammonium	3 ,,
Bromide of Cadmium	½ grain.
Bromide of ammonium	1 ,,

Bath.

Nitrate of silver	35 grains.
Rain or distilled water	1 ounce.

Add nitric acid until blue litmus paper turns red.

DEVELOPERS.

Negative.

Protosulphate of iron	½ ounce.
Glacial acetic acid	½ ,,
Alcohol	½ ,,
Water	8 ounces.

Positive.

Protosulphate of iron	¾ ounce.
Nitrate of baryta	½ ,,
Nitric acid	20 minims.
Alcohol	½ ounce.
Water	8 ounces.

Powder baryta and dissolve, then add the iron powdered; mix and let stand for about ten minutes, then filter out precipitate, and add nitric acid and alcohol.

Transparencies.

Protosulphate of iron	8 grains.
Or, pyrogallic acid	2 ,,
Glacial acetic acid	20 minims.
Citric acid	2 grains.
Water	1 ounce.

If tone too blue, decrease citric acid and increase acetic, or *vice versâ*.

J. BARKER.

CHRONO-PHOTOGRAPHY OF STAR TRANSITS.

FOR some time past I have had under consideration as a leisure subject the application of photography to the taking and timing of a star in transit across the meridian, and, as I fancy I can now see my way through the problem, I will endeavour to give an idea how it is to be done. To properly present it would require several sheets of careful drawings, which, had I the time to prepare them, would scarcely be of sufficient general interest to warrant the expense of producing blocks, or to induce the Editor to give the space for their appearance. Any description, therefore, must be of the nature of a sketch, which I hope to make sufficiently clear to enable a draughtsman accustomed to clockwork to produce the designs for an intelligent mechanic to work from.

Briefly put, the apparatus consists in the following:—

1. A small roll-holder with spool of sensitive paper, and sparking arrangement for the field of the telescope.
2. A similar one for the recording apparatus, which consists of three thin steel skeleton dials for indicating, respectively, seconds, minutes, and the hour, driven by the standard or other controlled clock, and moving between the sensitised paper and a sparking arrangement.
3. An ordinary clock with suitable gearing for driving the two roll-holders.
4. A source of electricity for producing the sparks.
5. A lever to actuate a clutch for imparting motion to the roll-driving gear, and to operate the switch that completes the electrical circuit.
6. "Contacts" on the clock pendulum for closing the sparking circuits to produce the spark in front of the two roll-holders.

Such are the main features, which I will now endeavour to describe in greater detail, and will commence with the fitting of the telescope. As in most cases it will be desirable to retain the instrument in a condition for eye observations, it will be necessary to open its tube at the side in the neighbourhood of the field or principal focus of the objective, and fit it with a grooved frame in which can slide another frame or carrier bearing the usual arrangement of cross wires in juxtaposition to a screen of metal having vertical slits, the centre or principal one being prolonged to the lower part of the plate, or on to a separate one if necessary. By pushing this frame from side to side either the cross wires or the slits may be adjusted in the field of the telescope for use at will. At the eyepiece side of the metal screen, in grooves or other mode of fastening, the small roll-holder carrying the slip of gelatino-bromide paper is secured, and at the foot of it on the other side, and opposite to the extended slit, a small receptacle for the sparking arrangement is affixed. The driving spindle of the roll-holder, being provided with a spur wheel on one end when in position, is made to gear into a similar one on a spindle having bearings on the sliding carrier, and extending outwards sufficiently to enable a light pulley on its end to be chain-driven from a loose pulley running on the end of the pivot of the telescope, where a second loose one in communication with the driving clock imparts motion to it by means of a clutch.

To give an idea of the principle of the recording apparatus, it will be well to imagine a clock fitted with centre seconds, minute, and hour hands. These being removed, fix upon their respective spindles,

in place of them, three light metal discs or wheels, varying to the extent of the band of metal forming the periphery in size. The rim of the outer, or larger one, is pierced with seconds, one to sixty—or half-seconds, by repeating each number in pairs, marking the second one of the pair with a dot, to distinguish it from the first—the rim of the next wheel with minutes, one to sixty: and that of the third, and smaller one, with the hours, one to twenty-four. A convenient point of these circles must be chosen for putting the fixings to the clock-case to carry the roll-holder and sparking box, between which the discs must have perfect freedom to revolve, the fine figuring on the discs being opposite to the narrow opening in the roll-holder in front of the sensitive band on the one hand, and to the opening in the sparking box, for the passage through the figures on the discs to the sensitive surface, of the light emitted by the spark on the other. The driving spindle of this roll-holder is geared up to the same clock which is driving the other one, the speed of both being alike. As the recording discs are driven continuously by the standard clock, accurate time to half a second, or less, is always shown at the above openings.

I need say but little respecting the source of electricity. Any of the methods of producing a small spark of just sufficient brilliancy to impress the sensitive surface will suffice, the apparatus for the purpose, I believe, being part of the outfit of most observatories.

A lever within reach from the eyepiece, constructed to actuate the clutch that throws the driving connexions of both roll-holders in and out of gear, also closes or opens the main breaks in the electrical circuits, whose complete closing and sparking depends on the pendulum of the standard clock, whose "contacts" must be placed to ensure its taking place instantly and exactly at the second or half-second, whichever circumstances may require.

Enough, perhaps, has been said in description for the present, it being extremely difficult to know when to stop. To go thoroughly into the mechanical details and necessities of each item is scarcely possible without working drawings and most tiring repetitions, and, as these would be out of place here, I will cease and leave it open for any one really interested in the matter to write to me privately at Littlehampton for any further enlightenment. It is necessarily a subject of interest to but a limited number only, the photographing and timing of stars in transit across the meridian being too expensive a luxury for private persons to indulge in. A few words in explanation of the working of such an installation will, however, not be out of place, and may possibly tend to clear up any point that is not quite plain in the preceding.

With this appliance *in situ*, the preparation for the transit of a particular star in respect of pointing the instrument and fixing it in position, would be made in the usual way. A few seconds before the computed time of passage, the lever would be shifted to connect up the rollers of the slides with the driving clock, and close the main breaks of the electrical circuits, immediately upon which the sensitive bands commence to move, the one behind the fine slots of the metal screen in the field of the telescope, the other behind the opening of the slide before which the numbered rims of the recording dials, that, through having been kept continuously in motion, show true time at that spot. At the same instant the standard clock, by means of its pendulum contacts, commences the sparking in the two circuits, and at each impulse passes one through the arrangement at the telescope, to impress itself on the sensitised surface travelling before the extended slit; and another from the front, through the small group of numbers on the recording dials to the sensitised paper in motion behind, this being repeated every time the pendulum makes a contact. The passage of the star across the slits will impress its image on the upper part of the band. A few seconds after the computed time, a touch of the lever suffices to stop both the rolling of the paper and the sparking, when a re-adjustment of the telescope may be done, and another star timed in like manner.

When the two bands of paper are cut from the rolls and developed, the one at every spark will show the hour, minute, and second in small dark figures; the other, at similar intervals, the same number of vertical lines, and above them the four or five dark short lines produced by the star as it passed over the slits. Should these appear, say, over the fifth vertical line, the fifth group of figures on the other band will give the true time of the transit to any degree of accuracy, the machine being unaffected by "personal equation." JOHN HARMER.

THE PRESENT POSITION OF PHOTOGRAPHY IN RELATION TO BOOK AND PERIODICAL ILLUSTRATION.*

Washed Drawings.

Now, although by any of these methods charming work can be produced, the negative taken will vary very much in each system. It is telling you, gentlemen, that which you already know, that, of the seven colours forming the solar spectrum, the blue ray, or actinic ray, is the only ray that works in photography, and that, as the tones approach nearest to the blue colour, so do they act with greater rapidity upon the sensitive plate, the blue sky being pure white in the finished print, while the red cow is black—both exposed the same time. This is just what takes place in the photographed drawing; as the white is more or less mixed with the washes, so it partakes of a blueish tint, the result being that the wash photographs lighter than the tone of the drawing, the parts where the white is not have a brown faded cast, the result being that the tint comes darker. I hope I make myself clear. This hastening or slowing of the different washes of the drawing, as they incline to blue (through the admixture of white) or to brown is going on all over in every little particular, the result being that the relative values of the tones in the finished photograph on wood are often wrong all over, and it is only by the engraver consulting his original every few minutes that he can pull it together at all.

Now, here is the danger of the tone photographic process; let the drawing be ever so suitable, this danger is always present. But no two artists draw alike, and, as a rule, no artist will draw long in one style, and I think you will follow me when I say that the object of the artist when he begins his drawing is to produce a good picture. He cannot be bound by any hard-and-fast lines without suffering from the restraint, and, although one artist's work may be more suitable for the purposes of a photographic process than another, there is a good amount of accident about it. Not only does this apply to tone drawings, but in pen-and-ink drawings also there is the greatest difference in handling of one artist against another; one will draw with a firm point and cross hatch at right angles, another has a timid, scratching style and a knack of cross hatching at very acute angles. The resulting block in the first place is a clear printing one, and in the other simply a block all over ink traps. Process men well know this, and get into disgrace with publishers, at times being blamed for want of skill, when the real fact is that they are powerless against a drawing that is unsuitable.

Another point comes in here. One advantage claimed for these drawings on paper was that the artist could draw much larger, and refinement by reduction would take place; like many things in this world, this sounds well, but how are the facts? Well, I will tell you how it works, both financially and in the resulting block; first of all, financially. Publishers have a knack of judging the value of the drawing by the size they produce it; and you can well imagine the feeling of disgust a photographer would have who had taken a 15 × 12 negative, and, this being approved by the customer, he is told, we will take half a dozen C.D.V.s. Now, the resulting picture, provided the drawing is a rough one, will improve by reduction; but, if the drawing is a satisfactory one, the small reproduction will, in many cases, have too much in it for printing purposes. My own practice is to draw a trifle larger, the slight reduction refining the work. As in engraving, I advocate the use of a magnifying-glass for the engraver, as the engraving appears on an enlarged scale, and the finished picture is reduced as seen by the naked eye.

Day's Process.

I have gone into these matters at some length, as it is upon these and the power of any process to meet all these difficulties that the ultimate success or failure depends; and, that you shall clearly grasp my reasons for the opinions I form of the way photography has grasped the difficulties, or failed to grasp them, and what, in my opinion, is its position to-day, and, clearly understand me, I purposely avoid touching the many interesting experiments made by photographers to produce surface blocks for typographical printing. I say nothing of the gelatine plate, made to swell up and then made a printing block by having small flints pressed into it; nor will I go into the latest company I have seen announced, where the zinc plate is put on one side, and the negative becomes the mould for the electrotyper. I have no shares in it, I am glad to say; but I do not like to spoil the amusement of any man. However, I cannot pass a process that is used by many papers. It is now some years ago since I saw it shown up at the Society of Arts, and worked a bit with it myself. It was then known as Day's process, and this is how it is used: A number of sheets of gelatine are pressed, some with lines, and some with dots. The roller of ink is rolled over the pattern chosen, and under this is placed the outline drawing on Bristol board. Of course, the design can be seen through the gelatine, which is ink-side down on the drawing. Now the operator presses down with a burnisher the parts he wishes transferred, the ink marking the Bristol board, and the deed is done; the pen-and-ink sketch becomes henceforth a mongrel affair, part pen-and-ink, and part engine-turned dots. I confess this is very painful

* Concluded from page 309.

to me, but it is a cheap way to produce an appearance of finish, and so is used pretty freely.

The Sketch and the Camera.

With the exception of engraving on wood by machinery (of which more hereafter), I think all processes for the production of pictures (we need deal with) for book and periodical illustrations are before you, and now let me see how the position stands to-day in relation to these things. I speak to you to-night as an artist and engraver, but I claim also to be an enthusiastic and successful photographer. I seldom stir out for a holiday without a sketch-book and a snap camera. When I found process causing a panic among engravers I turned my attention to photography, and instead of an enemy I found a true friend—a helper to me in many ways. I therefore speak without bias. I admire talent, no matter where it comes from; it is a beautiful brotherhood—the brotherhood of art—that no sea can divide, no distance keep asunder, no time efface. Although the hands are dust that laid the brush to the canvases in our national museums the art lives, and we worship the memory of those who produced it. It is this true love of art that cannot be kept back for long from a people yearly growing into higher tastes and knowledge that makes me doubt the possibility of any mechanical process satisfying them, and ever superseding the hand and brain of those who have made a life-study of art matters. I think the battle has been a good one, and in some respects photography has scored points and will hold them against all opposition. I feel sure, however, it will have to show much more pliability before it can supersede the woodcut from the highest to the lowest style of illustrated periodical. That there is a market for it we have proof, but only as padding to high-class periodicals. The struggling, sickly army of periodicals catch at it as a dying man at a straw; it is process or nothing for them, and pictures they must have, and process ones, at the very lowest possible price.

Where Photography has Scored.

I say that there are points where photography has scored, and, in many respects, routed the army of facsimile engravers, both in quality and price, although I cannot agree with the article in *Pick-me-Up* of a few weeks ago, that it has killed them quite. It has made them think, and, instead of being mere machines, they have learned to use the brains that are a great deal more plentiful in this world than some suppose if people will only shake off sloth and indulgence a little, and endeavour to think. You have heard me say here that photography has acted as a blue pill and black draught to art, and process has acted in the same way to engravers; but we are quite alive and kicking, I can assure you. I consider, when a good drawing in line has to be engraved, the photographic engraving process will render it with great beauty. I have some things by Abbey, printed in *Harper's Magazine*, that have much of the charm, and much of the sharpness, of etching. I do not, however, suppose for one moment that they were produced cheaply; but to produce the same thing by wood-engraving would require a talented man, and would take immense time, and this applies in all pen-and-ink work. Provided the artists who make the designs are talented men, and they are well printed on good paper, they leave nothing to desire; although the popular taste is not in favour of this style of work, and "never will be," they tolerate it if well done here and there, and in comic papers it is accepted, but they cannot be educated to believe that a man's coat can be satisfactorily expressed by cross lines.

The Tone Process behind the Woodcut.

The photographic tone process is, at the present time, far behind the woodcut in artistic merit. No matter how the process is varied, the same quality runs throughout the entire picture. Sky, middle distance, and foreground are rendered with the particular stipple or line alike; in one direction giving a tame and insipid result, so different from the engraved block where the hand of the engraver has translated the design with one quality and direction of line for the sky, the middle distance so fine, perhaps, that the line can scarcely be seen, while the foreground is made up of bold, vigorous touches, helping the aerial perspective and expressing the texture of any substance, any material; be it stone or silk, the process block expresses each with the same line upon the soft, sweet face of a young lady dressed in the choicest robes and the dirty old beggar in rags she is giving alms to. This want of quality of line is very dreadful to the educated taste, but I cannot see how it can be otherwise. Another trouble with the tone-process block is the lack of printing quality in it. It is true printers are surprised at what they get out of them, but they have to be very careful, keeping them very sparsely supplied with ink, and, as a result, getting prints lacking contrast, no true blacks, no true whites, all flat and grey. Publishers are shown by process men copies printed upon clay-faced paper, and jump to the conclusion that results ought to come as good as the specimens in their own publications; they do not stop to think that but a few copies only are printed, with the greatest care and with special ink. But it is a very different matter when large numbers have to be run off upon poor paper, with everything cut to the lowest price; so, until the tone process will stand the treatment a wood block will stand, it must perforce be greatly against it. You will at once see where the wood block and process differ. The engraver cuts in the deepest parts a line deep enough to ensure printing; as he approaches the lighter parts, he increases the depth of his cut, and in the whites he cuts deep holes, so that the ink-roller cannot possibly get at the wood. But in the process all are eaten away to the same depth, although engravers are employed to deepen the white parts and dodge up other imperfections; they are known by the dignified name of pickers. This is very noticeable where process blocks are used for advertisements in periodicals, as these pages on which advertisements appear have little care bestowed upon the pictures printed. Even the safest woodcut comes out very poorly; therefore the drawings, even in line, for these pages should be of a very elementary character, while the tone process is no good at all with poor printing, and this must be expected in the advertisement sheets of most papers.

Engraving by Machinery.

I spoke of engraving by machinery. Well, this is a most useful invention. The tool is held by a machine and so is the wood block, but every line is watched and varied by a competent engraver; and, although the main masses are cut by the machine, it has all to be gone over by the hand of the engraver to finish up, and also to cut all small details. It is principally used in cutting machinery, and the beauty and accuracy of every line directed by the brain of the engraver gives a result that I do not think anything can beat, while for printing purposes it is simply splendid, the cut being so firm and true.

I have gone into this matter at some considerable length to-night, and to the best of my ability I have placed all processes for the production of pictures for our books and periodicals before you, and now I have only to run over the ground quickly and close my lecture. Well, then, the present position of photographic process is that line photographic process in good hands from capable drawings is most useful, cheap, and faithful. As regards the tone process, although it is used very extensively, it is very unsatisfactory all round; it is three times the price or more than the line process; it is tame and uninteresting, unsafe in printing, and in no sense can it compare even to cheap engraving; it is an apology for a picture, possessing very little artistic merit; it is unsuited for high-class work, and also just as unsuitable for cheap periodicals, given anything like long numbers. No, something much better must come to the front before the tone drawing for our periodicals can be taken from the engraver, and I am at the present time reproducing a number of things that were done by process and are thrown aside as not suitable; the machine engraving shuts the door upon it for all mechanical work, and, but for the band of starveling publications that live upon advertisements and trade puffs, it would have but few customers. What its future may be it is impossible to say; but of this I am sure, that the principle is wrong, to render everything with one line or stipple, which must produce tame and inartistic work, and in these days of higher education in art matters, even if the technical difficulties of cheap printing with poor paper and ink, running long numbers, can be overcome, popular taste will be felt by the editor who stands at the helm of his periodical, and that taste will demand in any photographic process the same artistic rendering of subjects that the old engraving is capable of.

Tom Symmons.

THE "ANSCHUTZ" INSTANTANEOUS CAMERA.

Our readers will remember that some months ago we drew attention to a remarkable series of animal and other studies by Herr Anschütz, which were on view in this country for a few weeks, and we have now had an opportunity of inspecting the camera—or, at least, what we are assured is an exact *facsimile* of it—by which those pictures were taken. The "Anschütz" camera has a solid body, and is fitted with a five-inch rectilinear lens, by Goerz, with rack and pinion adjustment for focussing. The focussing screen occupies the usual position, but the necessity of employing a focussing cloth is obviated by an opaque, collapsible hood being fixed on the screen-frame, which renders the screen sufficiently dark for focussing by. The shutter, which is of the curtain type, works immediately in front of the plate, and its rapidity is controlled by separating its halves vertically—the largest opening allowing of an exposure calculated to be one-seventy-fifth of a second, the diminution of the opening down to one-sixteenth of a second, reducing, it is said, the exposure to one-thousand two-hundredths of a second. The shutter is wound, and set by a milled-head screw at the side of the camera, and is released by touching

another in front. The finder consists of a square frame, equally divided into four, placed on the front of the camera, and when the object is axial to the centre of the cross wires, and a small upright on

the back of the camera, it occupies the central portion of the picture. Solid double backs are supplied with the camera, which may be employed on a stand as an ordinary camera, and, with the special head supplied placed in a number of positions. The Anschütz appears a very serviceable and workmanlike instrument for moving objects. It is in the hands of the Blackfriars Photographic Company, of Surrey Row, S.E.

Our Editorial Table.

"Photographic Work" is the title of a new weekly contemporary issued by Messrs. Piper & Carter, so long connected with the *Photographic News*. The latest claimant for public favour is both well edited and well printed, and, according to the address to its readers, is intended for "the busy man."

Photographic Notes and Formulæ.

By Sir David Salomons, Bart., M.A., F.R.A.S., &c.

This brochure (published by Marion & Co.) consists mainly of papers and articles written by the author at various times. Among the topics treated are "Large Heads in the Studio" (for which a lens having a focus over thirty inches is recommended), "Rules for Exposure," "Relative Rapidity: Ratio and Standards," "The Distance beyond which all will be in Focus," "Enlarging and Reducing Tables and Exposures," "Depth of Focus," &c. These and other topics are most lucidly dealt with, although their proper appreciation will require mathematical knowledge.

The Perfect Light Filter.

By Hunter & Co., Herne Hill, S.E.

Messrs. Hunter & Co. have sent us a sample of a specially stained paper which transmits a considerable amount of light that is reasonably safe either for the dark-room window or the lamp-shade. We entertain a high opinion of it.

We have received the catalogue of Messrs. S. B. Hardcastle & Co., of East-street, Brighton, which, for size and completeness, vies with the lists of many London houses. The catalogue of Mr. George Kemp, of Chester, has also reached us. It is concise and neat.

Climax Plates.

A package of dry plates, "the Climax," received from John J. Griffin & Sons, Garrick-street, W.C., has been tried by us and found excellent. Their sensitometer number is 22.

Glanzfarben für Photographische Retouche.

Hinton & Co., Bedford-street, Strand. [illegible]

Now that so much printing is done upon highly glazed paper such as the aristotype, a suitable medium for spotting prints, and one which would preserve the glazed surface, was much needed. This is now being supplied by Messrs. Hinton & Co. in the form of little collapsible tubes of colour with screwed tops, a set of seven of which, fitted in a neat pocket case, supplies the requirement for spotting in every shade, from white to the darkest tone obtainable, passing through every intermediate gradation. Each tube bears on it an appropriate colour band, showing exactly the nature of the pigment it contains. This set must prove a great convenience to all who desire to send out spotless prints.

Developing Dishes for Yachting.

Messrs. Hinton & Co. have also introduced a set of developing and fixing dishes of a novel and useful character. The edges are turned over, lapping inwards, in such a way as to prevent the spilling of the fluid contents, even when moved about or held with the extreme of unsteadiness, as in a yacht on a much-troubled sea. The special adaptation of each dish is imprinted on the ends or side of each in bold black letters, which are sunk in the material. This is a novelty in dishes, and one which will commend itself to all.

Mr. W. J. Dibdin, of Sutton, Surrey, has sent us a very neat and conveniently arranged automatic card exposure table, which shows at a glance the exposures to be given under different conditions of light and stops. It is both handy and convenient.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 7769.—"An Improved Portable Camera." W. O'Reilly.—*Dated April* 25, 1892.

No. 7898.—"Direct Silhouette Portraiture by Photography." J. C. Cox.—*Dated April* 27, 1892.

No. 7990.—"Improvements in Photographic Dark Slides." F. H. Ibbetson.—*Dated April* 28, 1892.

No. 8067.—"Improvements connected with Photographic Cameras." S. W Rouch.—*Dated April* 28, 1892.

No. 8145.—"Improvements in connexion with Artificial Light Photography." Complete specification. C. E. Elliott.—*Dated April* 29, 1892.

No. 8192.—"An Improvement in Photographic Hand Cameras." H. Lashbrook.—*Dated April* 30, 1892.

No. 8194.—"Improvements in Photographic Printing Frames, which Frames are also applicable to other purposes." C. Beck and F. O. Bynoe.—*Dated April* 30, 1892.

SPECIFICATIONS PUBLISHED.

1891.

No. 7785.—"Reproducing Photographs." Krantz & Zeissler.
No. 8121.—"Photo-etching on Zinc, &c." Krantz & Zeissler.
No. 9591.—"Photographing Engineering Drawings, &c." Palmer.

1892.

No. 1681.—"Lantern Slides, &c." Scanlan.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
May 16	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 16	Hastings and St. Leonards	
,, 16	Leeds (Technical)	Mechanics' Institute, Leeds.
,, 16	South London	Hanover Hall, Hanover-park, S.E.
,, 17	North London	Wellington Hall, Islington, N.
,, 17	Oxford Photo. Society	Society's Rooms, 130, High-street.
,, 17	Southport	Shaftesbury-buildings, Eastbank-st.
,, 18	Brechin	14, St. Mary-street, Brechin.
,, 18	Bury	Temperance Hall, Bury.
,, 18	Manchester Camera Club	Victoria Hotel, Manchester.
,, 18	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 18	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 18	Southsea	
,, 18	West Surrey	St. Mark's Schools, Battersea-rise.
,, 19	Brixton and Clapham	Gresham Hall, Brixton.
,, 19	Camera Club	Charing-cross-road, W.C.
,, 19	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 19	Oldham	The Lyceum, Union-st., Oldham.
,, 20	Cardiff	
,, 20	Holborn	
,, 20	Leamington	Trinity Church Room, Morton-st.
,, 20	Maidstone	"The Palace," Maidstone.
,, 20	Richmond	Greyhound Hotel, Richmond.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

May 10.—Mr. T. Sebastian Davis, F.C.S. (Vice-President), in the chair.

Mr. Harold Sands was elected a member.

During the evening the Chairman welcomed Mr. F. E. Ives, of Philadelphia who was present, to the meeting of the Society.

The Exhibition and the Convention.

It was announced that the following gentlemen had been chosen as Judges for the next Exhibition of the Society:—Messrs. F. P. Cembrano, jun., W. E. Debenham, W. England, F. Hollyer, and J. Traill Taylor, and, as scientific experts, Captain Abney and Mr. Andrew Pringle.

The following gentlemen were nominated as delegates of the Society to the forthcoming Photographic Convention of the United Kingdom at Edinburgh in July next:—The President (Captain Abney), Messrs. W. Bedford, N. Cowan A. Mackie, L. J. Montefiore, A. Pringle, J. Traill Taylor, and L. Warnerke.

A Proposed Photographic Record and Survey.

Mr. W. Jerome Harrison read a paper on *A Photographic Record and Survey*, in which, after mentioning that a topographical survey of the United Kingdom had its origin in the conflicts with the Highlanders, he traced the history of the various Ordnance Survey maps which had been prepared during the century, and referred to the photographic work done at the Survey Office at Southampton, and by Colonel Waterhouse in the Government Survey of India. In the records of the Hydrographic Survey there was no reference to photography being employed; but in the German Navy it was employed to make rapid surveys of coast lines. The Geological Survey was based on the work of the Ordnance Survey, and photography was not employed. The United States employed skilled manipulation largely for the same kind of work. The Committee of the British Association, appointed in 1889, had secured 588 photographs of geological interest. The same Association had also appointed a Committee to collect photographs of clouds, &c., of which 153 had been obtained. In the survey of the heavens more progress had been made than in that of the earth, as, thanks to Messrs. Henry, they had a better idea of the visible parts of the moon than of the Polar regions or Central Africa. The desirability of a photographic survey was obvious. The historian, the man of science, and the artist would give a great deal for photographs taken at the close of each century for the last 2000 years. Briton, Roman, Norman, and Saxon history would have been brought down to us. Change in the appearance of things was rapid; churches were being restored, old houses swept away, dress becoming uniformly ugly, and manners and customs changing. Photography should supply a record of the present state of things for posterity. The survey would be best carried out by professional photographers—individuals, Societies, and the Government. In 1888 he suggested the appointment of State photographers, and the idea was endorsed by Captain Abney. As had been recently gathered from Dr. Jeserich's paper, a photographer attached to each police division would be useful in criminal cases. In the case of the recent Whitechapel murders he might have photographed certain inscriptions on the walls, attributed to the murderer, before they were obliterated. Having pointed out the part which individuals, Government, and Societies might take in the work, Mr. Harrison said he estimated the 251 British Societies included in the Almanac to have a membership of 20,000, and the total number of photographers, amateur and professional, in Great Britain to be 250,000, and then proceeded to give a history of the Warwickshire Survey, founded by the Birmingham Photographic Society, the work being undertaken in sections, with the six-inch Ordnance Map as a basis. Exhibitions were held in 1890 and 1892, at which there were classes for Survey pictures. Referring to the later work of the Survey Council, he said the size of picture recommended was whole-plate, and the pictures had to be printed by a permanent process, and mounted on mounts provided with all details as to subject and the focal length of the lens on the back. A special exhibition opened in Birmingham on Monday next, at which 1000 prints, the majority whole-plate size, were to be exhibited. In future there would be annual exhibitions, and possibly a quarterly journal and portfolio would be issued. The section for the Birmingham Society for 1893 comprised Stratford-on-Avon and the Forest of Arden. The Birkenhead, North Staffordshire, Cardiff, Manchester Amateur, Wolverhampton, Barnstaple, Chester, and Exeter Amateur Societies were doing survey work. In conclusion, Mr. Harrison remarked that the parent Society was subject to long periods of lethargy, from one of which it had recently recovered. It ought to be a Royal and chartered Society. He commended the matter of the survey to the Affiliation Committee.

Mr. T. Bolas drew attention to a work on Photogrammetry, by Commandant Legros; also an article in the *Correspondenz*, dealing with photogrammetry; and Mr. W. E. Debenham said that photogrammetry was thoroughly worked out in Germany. Several recent publications had detailed instruments and methods for enabling surveys—but not of a picturesque character—to be made.

Mr. F. Ince objected to the term Photo-survey, as used by Mr. Harrison, which did not convey the idea the lecturer gave. He imagined some description would be given of the way in which surveying would be done by photography. The system of taking such pictures as were on the walls in many parts of the country was, no doubt, useful for enabling us to keep records of the kaleidoscope changes of the time, but they were in the nature of a record, and not of a survey.

Mr. G. L. Addenbrooke thought that the exact places from which pictures were taken should be carefully recorded, and the focal length of the lens given, so that dimensions could be calculated. In that way it would be possible to ascertain the extent of the subsidence of buildings, as well as the growth of trees, the general aspect of the country, and the course of streams, the photographs enabling them to form an estimate of the action of time; but this could only be done carefully, and under scientific directions, and hardly in the way Mr. Harrison suggested—by photographic excursions, which were not in the nature of a survey. The pictures shown resembled the work done by the Society for Photographing Old Buildings in London. If a workable scheme were made on a more limited and humble scale, perhaps the Society might carry it out in conjunction with the affiliated Societies.

Further remarks having been made by Messrs. Bolas, Debenham, and Clifton,

The Chairman drew attention to a large number of photographs of geological subjects taken many years ago by Mr. Cole, a member of the Society, which were now on view at the School of Mines, in Jermyn-street. The prints appeared to be not only permanent, but to convey a most interesting impression of the objects photographed. He suggested the application of Mr. Harrison's idea to the photographing of rock sections, which could be shown in the lantern. Mr. Harrison had said that we were more fortunate in our knowledge of the heavenly bodies than of the earth; but, in the case of the moon, our knowledge of it only extended to a few degrees in each direction, and it must be many years before we knew anything of the other portion away from us. The Chairman concluded by suggesting the application of photography for providing a record of the changes which the fauna of the country were undergoing.

Mr. P. Everett said Mr. Harrison had given a most extensive programme, with which the Affiliation Committee was not at all in a position to deal. The matter would involve a large amount of work and organization, and the necessary funds were not at their disposal. He liked to look at the thing practically, and he had serious misgivings as to the utility of a survey conducted on the lines indicated. Topographically or geographically, he doubted if the pictures shown would be of any great service at any future time. No system seemed to have been pursued in their production. They did not seem to have been taken on any definite plan or with any definite end. For a permanent record some system should be adopted. As to Mr. Harrison's suggestion, that at some future time the matter should be taken up by Government, they heard that said of everything; but no reason had ever been shown why the Government should take up this scheme. He (Mr. Everett) regarded the scheme as very immature and requiring considerable elaboration.

Mr. Harrison, in the course of his reply, pointed out, in answer to Mr. Addenbrooke, that the pictures shown had the focal length of the lens with which they were taken included with the other particulars. As to Mr. Ince's objection to the term survey, he (Mr. Harrison) said the word record had been coupled with it. The possibilities of the subject were infinite. He thought a workable scheme might be formulated, with the Society at the head of it. The pictures shown that night were only a sample of about 1100.

A vote of thanks was passed to Mr. Harrison, and the meeting terminated.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 5.—Mr. B. Foulks-Winks in the chair.

Mr. W. E. Ward was elected a member of the Association.

Mr. R. P. Drage (the Hon. Secretary) said some doubt had been expressed at the previous meeting as to whether the blacks of the new cold-bath platinum process dried as well as in the hot-bath process. He had dried some prints, and thought the blacks were as good.

The New Concentric Lens.

Mr. J. A. Sinclair, in reference to the new concentric lens, said that some very wonderful statements had been made about it in the photographic papers, from which he thought, at first, they ought to take a discount. However, he had tried one of the lenses, and had brought it with him, together with some negatives taken with it. It was of five inches focus, and therefore suitable for a quarter-plate; but he had made his exposures on half-plates, with the full aperture, *f*-16, although originally the makers indicated *f*-22 as the largest aperture. With that stop (*f*-16) he had got good definition over the whole of the plate. He had also employed the back combination only, with *f*-32, on a whole plate, focussing the centre of the picture, and the results were very good. They would observe that the picture did not seem to be quite rectilinear on the whole plate, but possibly the hoarding in the picture was not straight. It was not quite straight in the half-plate. He showed another whole-plate, from which they would see that the definition up to the edge of the circle, with *f*-22, was very good. He had produced results with the lens which he had never expected to get with any lens. He thought the thinness of the lens made it more rapid than others of equal foci and aperture.

Mr. J. Traill Taylor also handed round a similar lens of eighth inches focus for examination.

Mr. W. E. Debenham had seen one of the lenses. He agreed that it was a great advance, and that it was a very valuable lens indeed; but he disagreed with the statement that the concentric lens, being thinner than a symmetrical, acted more quickly. The difference between the loss of light with the portable symmetrical was absolutely inappreciable. There was a certain loss of light in passing a number of surfaces, but there were the same number of surfaces in the concentric as in the portable. Would Mr. Sinclair say how much the lens was displaced to get the edge of the circle on the plate?

Mr. Sinclair could not say. With a five-inch he could get the edge of the circle on a whole-plate; but with a plate eight and a half inches square the whole of the circle could be got.

Mr. P. Everett said it had been claimed that the lens did not vignette the edge of the circle, but in the example before them the circle had a distinct vignette.

Mr. Sinclair said that at the time he was making the exposures the sun was shining in the lens.

Mr. H. Snowden Ward exhibited a book of studies, arranged by Mr. Hetherington, a New York background painter, the accessories being built up of canvas and other materials, portrait studies by various photographers being included. The studies gave hints and suggestions of what could be done or avoided. As regards the arrangements of the surroundings, he thought everybody would give a great deal of praise to the man who had got up the book. Mr. Ward also exhibited a colour screen for orthochromatic work, made by Mr. Carbutt, of Philadelphia, for which he claimed advantages over tinted and optically worked glass. It consisted of two thin glasses, with a film of stained gelatine mounted between them. Mr. Carbutt produced any tint wished for. A third exhibit shown by Mr. Ward was a camera level, by Mr. A. H. Baird, of Edinburgh. This consisted of a small plumb-bob, for attaching to the side of the camera back.

Mr. J. S. Teape had continued his experiments with the dark-room medium introduced by Mr. Bridge at a previous meeting. Exposing behind various thicknesses of red and yellow fabrics, and one thickness of the new medium, to four inches of magnesium, it was difficult to find where the light had penetrated the one thickness. With six inches the impression through it was very faint. An image was seen through two thicknesses of golden fabric, and that image was certainly stronger than the image given by one thickness.

of the new medium. It had been conclusively shown by this that one thickness of the new medium was better than two thicknesses of golden fabric. He had examined the new medium spectroscopically in the sun, and could not see a trace of blue in it.

Mr. J. BARKER read a short paper on *The Wet-collodion Process* [see p. 311].

COLLODION POSITIVES.

Mr. TAYLOR exhibited some collodion positives, which, while deficient in artistic merit, were made about forty years ago, and drew attention to the purity of the whites, to get which, he said, it was necessary to give moderately brief exposure. For a developer he had employed the usual iron solution, of about twelve to fifteen grains per ounce, with two drops of nitric acid. The great secret in getting pure whites was in the fixing. An old sample of cyanide should be continually poured on and off the picture. There was a species of electric deposition produced, under which the silver image was intensely whitened. A little bisulphide of carbon in the bath also deposited the silver in a sheeny form, which often imparted a beautiful charm to the collodion positive. Another method was that of Scott Archer: this was to dissolve bichloride of mercury in hydrochloric acid and nitric acid, alcohol, and water added. Poured on the plate, its first action was to dissolve away part of the image, but when the mercury asserted itself the image acquired great piquancy.

Mr. TEAPE said that, in making collodion positives, he had aimed to get toned pictures, as he noticed they were generally preferred. He thought whiteness gave harshness, and a tone greater richness. In the specimens shown the toned pictures seemed to have a flatness of image.

The CHAIRMAN said this was due to the weak light by which they were examining them. They would look excellent by daylight. For flesh tints he thought Mr. Taylor's pictures too white.

WET COLLODION.

Mr. EVERETT asked Mr. Barker how the rapid formula he gave would compare in rapidity with Ilford ordinary plates.

Mr. BARKER said that would depend upon the quality of the light. There would, he thought, be very little difference; in fact, he thought it would be quite equal. On a dull day in November the collodion would not be so rapid.

Mr. DEBENHAM said one of Mr. Barker's negatives was a confirmation of his (Mr. Debenham's) observation, which was not generally recognised, namely, that old collodion negatives became much more intense by keeping. Several of his old negatives would not yield decent prints now. Superior people pitied those who made such negatives. He thought this intensifying effect should be made known, in order that people should not form a wrong impression of old collodion negatives. The negatives had been intensified after fixing, and possibly some trace of pyro and silver had affected the colour of the image since. As to the formula given, he did not know how Mr. Barker got one grain of bromide of potassium into the ounce. He (Mr. Debenham) had brought a collodion and a gelatine enlargement, to illustrate the difference between them, the former showing greater clearness and purity in the blacks.

Mr. BARKER pointed out, in reference to Mr. Debenham's remark as to the quantity of bromides and iodides in the formula given, that a fifty-grain bath was recommended, which prevented bursting out in the film. He had even put three or four more grains per ounce in the collodion, and had used a bath 100 and 120 grains strong. An unsuitable sample of pyroxyline would not make a collodion at all.

The CHAIRMAN said that, with regard to Mr. Barker's remarks as to the strength of the bath, he was quite correct, and he agreed with Mr. Teape as to what he had said of the tones of the collodion positives. Mr. Barker's positives, if seen in the daylight, would be quite strong enough. Mr. Taylor's positives were lacking in detail, and the shadows were black. He had used Mr. Taylor's developer himself, and found it a good one.

Mr. DEBENHAM said that, in the bath he had recommended at a previous meeting, recrystallised silver was not necessary.

Mr. BARKER said there was an enormous increase in the sensitiveness of a bath made by fused silver, as against recrystallised.

The meeting then terminated.

North London Photographic Society.—May 3, Mr. J. Traill Taylor in the chair.—The evening was occupied as a special Lantern Night, to which ladies were invited, and attended in almost as large number as the members. The various slides were shown by Mr. R. J. Grover, and the series consisted of the set of Indian and Colonial slides now being circulated by the Photographic Society of Great Britain under the affiliation rules, followed by selections of slides contributed by Messrs. Grover, Rev. E. Healey, Douglas, Groundwater, Spiller, and Walker, and a number of slides of the Terraces in New Zealand, lent by Mr. Oakley. The slides gave great satisfaction, and a vote of thanks was passed to Mr. Grover and to the Secretary, who had acted as spokesman. The next meeting will be on March 17, and will be a Technical Meeting, at which the question of *Films* versus *Glass Plates* will be discussed. Visitors are invited.

North Middlesex Photographic Society.—May 9.—The last Lantern Exhibition of the season was held. Messrs. Barnard, Beadle, Gill, Gregory, Johnson, Jones, Mummery, Pinukett, Taylor, Treadway, and Wall exhibited slides. The selections shown were remarkably good, great improvement being noted in the work of some who had recently begun the study of the art. A selection of Indian and Colonial slides, loaned by the Affiliation Committee of the Photographic Society of Great Britain, proved most interesting. The next meeting will be held on Monday, the 23rd inst., when Mr. J. C. S. Mummery will demonstrate the working of gelatino-chloride paper, various brands and processes. Visitors will be welcome.

People's Palace Photographic Club.—May 6, Mr. W. K. Walker in the chair.—Members' open night. Mr. KENDALL asked, if a print occupied ten minutes in printing, how long would it take if a piece of ordinary, clean sheet glass were placed over the frame? In reply, it was stated that ordinary sheet glass stopped, roughly, about ten per cent. of light. The time would, therefore, be about eleven minutes. Prints from members' negatives taken at the Good Friday outing were passed round for mutual criticism. Mr. Noble' photographs of some quaint corners of Maidstone were deservedly admired. Some stereographic pictures, mounted in optical contact with glass, were on view. This was considered a great improvement on the older method of mounting on card, as the prints were preserved from scratches, and had greater brilliancy.

Holborn Camera Club.—May 6, Mr. Fred. Brocas in the chair.—Mr. A. HORSLEY HINTON read a paper on *Motive and Method*. Before taking up the paper Mr. Hinton took the opportunity of expressing his high appreciation of the honour the Club had done him in desiring him to take the presidential chair, and, whilst thanking the members, he asked them to admit him also as a working member. With regard to the paper itself, in selecting the subject, it had been his intention to endeavour, not so much to teach, as to offer some practical suggestions. His own photographic endeavours had but one end in view, namely, the furtherance of photography as an art, or at least the ascertainment of its artistic capabilities. He did not assert that photography was an art, for he had not fully convinced himself that such a statement was, as yet, justified by what they knew of its artistic possibilities. Not without hope, however, had he set himself the task of ascertainiug, for himself at least, what position amongst monochrome graphic arts photography might yet command. In photography he found he cared little for the chemical and optical phenomena with which one is brought into contact; they were to him as the mere tools and materials of the artist, with which they had nothing to do beyond acquiring sufficient knowledge of their peculiarities to enable them to use the chemicals intelligently. He would ask them to deliberately and clearly separate the scientific interest from the artistic, making up their minds which it was that appealed most strongly to them, which it was that caused them to feel such an interest in the improvement of their photographic work, or that which awakened their admiration for the work of others, and guided them in selecting their favourite pictures on the Exhibition walls, and sent them home full of great resolves for future exercise. Whichever branch of photographic work they chose, let them keep to that branch, whether it be scientific, artistic, or recreative. He wanted to draw the line firmly and definitely. From the earliest time, when the possibility of employing photography as a means of artistic expression was first perceived, men of disciplined scientific men had passed judgment upon those artistic aspirations of their colleagues which they were utterly incapable of understanding. Misunderstanding and failing to appreciate the artist's aim, they had involuntarily extolled or condemned those things which best seemed to exemplify the technicalities of their craft. So, men of different temperament, of opposite tastes and purposes, had, because brought together under the one title of photographers, been disputing and disquieting each other until now, each failing to understand that his object and pursuit might have nothing to do with that of his fellow. The sooner they recognised the wide distinction, and yet admitted that there was room for both, the better would they be able to follow out their own course, and each section of photographic endeavour, specialised in its proper channel, would the quicker meet with the recognition which it deserved. His intention in thus insisting upon the separation of the scientific from the artistic was because, in their services in the one or the other, they betrayed their initial *motive*. He then went on to compare the works of painters with photographs. Put the painter's representation of a landscape side by side with a photograph of the same, both being identical in every particular, and an unprejudiced observer would admit that, apart from colour, there was an undefined quality in the painter's rendering of the scene which the photograph wholly lacked. This quality appeared to be independent of the physical constituents of the scene, and it was therefore suggested that it was the expression of the ideal which the artist himself contributed. Presuming they were agreed that they were safe in emulating—he would not say imitating—the aim of the painter, they must accept the same as their motive, and he further ventured to suggest that it was just that higher and more intelligent motive which elevated one's work to something higher artistically. Every photographer should pause before a landscape in nature, and view it, it might be, with half-closed eyes, or any way so that they could prevent their attention being carried away by individual objects, and, pausing, see if they could find some expression behind it all—some one or more of all the glad sentiments of a bright spring morning, or the gloom and solemnity of a winter's storm. Let their motive for picture-making be that the scene, apart from the interest and prettiness attached to particular objects, conveys a sentiment, a feeling, an idea which seemed to them worthy of retaining. A brief reference to *method* closed Mr. Hinton's remarks, touching mainly upon printing, which, in his opinion, was the salvation of photography. A short discussion followed.

Brixton and Clapham Camera Club.—May 3, Dr. J. Reynolds (President) in the chair.—A paper on *Some Conditions Influencing the Welfare of Photographic Societies* [see page 311] was given by Mr. W. H. HARRISON, the new Vice-President of the Club. At the conclusion of the paper a number of slides taken by Mr. Leon Warnerke (who was, unfortunately, absent), to illustrate his paper on *Continental Photographic Institutes*, were described by Mr. Harrison, the Club lantern being used for showing them. The question box was opened, and some discussion took place upon the new platinotype paper.

Birmingham Photographic Society.—The first excursion of the season took place on Saturday, May 7. Thirty-five members and friends assembled at New Street Station and took train to Marsden Green. From thence, under the leadership of Mr. E. Howard Jacques, the party proceeded by way of Olcott Wood, Chelmsley Wood, and the River Cole, to Coleshill, where tea was provided. The walk was greatly enjoyed, the weather being charming. Upwards of 150 plates were exposed. The Council offers a prize (an enlargement) for the best picture taken on each of the Society's excursions. A hearty vote of thanks was unanimously accorded to Mr. Jacques for the trouble he had taken to make the outing a success.

Lewes Photographic Society.—May 3.—A paper was read by a member of the Society on *Retouching and the Artistic Improvement of Landscape Negatives*. The paper, which was practically demonstrated, proved most interesting, and was voted one of the most practical that has been read before the Society. At the close some stereoscopic views by Messrs. Underwood & Underwood were shown and much admired by those present.

Rotherham Photographic Society.—May 3, Dr. Baldwin (President) in the chair.—*Hand Cameras and Hand Camera Work* was discussed, a short paper on the subject being given by Hon. Secretary. It was contended that something more than mere records could be obtained by an intelligent use of the hand instrument, proof being forthcoming in the work of Mr. Dresser and others that picture-making came within its scope.

Sheffield Photographic Society.—May 3, Mr. B. J. Taylor in the chair.—The President gave a demonstration of the new Ilford printing-out paper, which called forth a discussion. It was generally acknowledged by the members present to be superior to ordinary albumenised paper.

Tyneside Camera Club.—The first excursion of the summer session was on Saturday, the 7th inst., to the ancient city of Durham. Very little time was spent on the railway journey, as express train was used each way. There was some difficulty at first by the railway company refusing to carry a Photographic Club at pleasure-party rates; but, after some "red-tape business" was gone through, they granted the pleasure-party rate. The North Eastern Railway Company state that it is the first application they have had from a Photographic Club. At Durham, the castle, the cathedral, river, and other objects of interest, of which the place abounds, had numerous plates exposed on them. When the Club kept in a body the large array of cameras—all sizes, shapes, and colours—on several occasions attracted a large crowd of curious and inquisitive persons, chiefly miners "on strike."

Edinburgh Photographic Society.—May 4, the President (Mr. H. L. Blanc, A.R.S.A., in the chair.—Mr. JAMES PATRICK read a paper on *The Imitative and Imaginative Side of Photographic Art.* In treating the subject he pointed out that photographic art was not to be considered, nor yet judged, of, as a rival to its elder sister in representative art, painting, but neither was it to be looked upon as a handmaiden to it, although it had done much for the painter in such matters as correct representation of details. He also pointed out that imitative work was not, and should not be, the chief aim of photography, but that, by proper means, it was possible to produce the higher class of imaginative art. No one would ever be able to give a poetic conception or treatment of any subject if his only aim was imitation. As showing how photography had influenced the work of the painter, he instanced cloud forms, moving water, and many other aspects of nature, for the truthful representation of which they were indebted to it. As a rule, painters were very severe in their criticisms of photography, some, indeed, denying it the faintest claim to be an art, calling it a mere mechanical handicraft; this rash statement, he maintained, was not true. Had not the photographer to deal with and represent the same subjects as many of the painters had, certainly not of those in whom the art of design and the higher imagination was developed, but they were the few compared to the many? The photographer who, by any means, expressed sentiment and showed feeling in his work, was an artist in the true sense of the word. The great difficulty he had to contend with in the exercise of his art was due to the colour difficulty; he had to depend entirely on simple light and shade in producing his representations of external nature. No doubt, the power given by many of the photographic printing processes enabled more artistic work to be produced, but the principal thing to be studied was light and shade, in order to get the true pictorial effect. This was not always attained, as some appeared to think, by having the light coming from behind or from either side of the camera. Some of the best works he had seen were taken with the sunlight in front of the lens. This mode of lighting gave a breadth and suggestiveness altogether unattainable when the usual orthodox lighting was employed, and in support of this view Mr. H. P. Robinson's *Wayside Gossip* was referred to as one example among many. Mr. Patrick, in speaking of the Impressionistic school, had no hesitation in saying that, however Dr. Emerson may have repudiated it, his work was bound to have a refining influence on "Photography as a Fine Art." If his works had done nothing else, they at least showed that breadth of light and shade, rather than excessive sharpness of focus, was the backbone of all true Art. So long as the desired effect was obtained, it was of no consequence how the picture was produced, nor with what instruments or other accessories. To be at all successful as an artist, every photographer must first be conscious of the limitation of his means for producing effect, and, when aware of the bounds within which he could work, he would be prepared to study his subject from various points of view and with the prospects of ultimate success. For many subjects, as, for instance, the view of a glen with mist on the hills, he advocated two or three negatives, using combination printing as the proper and best means of giving a true rendering by photography of what is actually seen in nature. This, he showed, was true artistic selection, and raised what was too often regarded as a purely mechanical process to the dignity of selective and imaginative art. The second ramble for the season will take place on June 4, to the grounds of Mr. Munro-Fergusson, M.P., at Raith, Kirkcaldy, at ten minutes past two p.m., from Waverley Station, and the third and last ramble will be held on the afternoon of Saturday, June 25, to East Linton, leaving Waverley Station at fifty minutes past one p.m., and for both specially reduced fares have been arranged, Raith being 1*s.* 6*d.*, and East Linton 2*s.* 6*d.*

Dundee and East of Scotland Photographic Society.—May 5, Mr. J. D. Cox, President, in the chair.—It was arranged that the first outdoor excursion should be held at Kilicrankie and Pitlochrie on the day observed as the Queen's Birthday. Specimen prints on Jacoby's collodion paper were exhibited by Mr. O. Scholzig. The prints were from negatives varying in density from thin to dense, but the resulting tone in each was identical. Although this paper does not print quite so fast as some of the gelatine emulsion papers, it tones quicker and very evenly. A French lens, with Iris shutter and the Perpetual shutter adapted for working in front of the lens, were exhibited by Messrs. Lawdon and Feathers respectively. The following office-bearers were elected for the ensuing session. *President:* Mr. J. D. Cox.—*Vice-Presidents:* Messrs. G. G. Maclaren, and William Salmond.—*Council:* Messrs. W. Baxter, P. Feathers, D. Ireland, Dr. McGillivray, J. W. Munro, A. Stewart, J. R. Stewart, J. R. Wilson, W. Bertie, W. F. Hill, Dr. Tulloch, and H. Valentine.—*Secretary and Treasurer:* Mr. V. C. Baird, Broughty Ferry. Prizes were awarded in the "Landscape with Figure" Competition to, 1st, V. C. Baird; 2nd, W. Bertie; and, 3rd, J. Rogers.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

PHOTOGRAPHY IN NATURAL COLOURS.

To the EDITOR.

SIR,—In your JOURNAL, May 6, p. 295, you reproduce a report of the lecture Mr. Ives has given with Mr. Jennings in Philadelphia, with the coloured lantern slides of the first-named gentleman. Mr. Jennings says of his co-labourer: "When about thirteen years ago Mr. Ives undertook to reproduce by means of photography the colours of nature, he fully realised that no light task was before him." I do not object that Mr. Jennings should praise his "co-labourer" a little high before an American audience—that is only patriotic. But as Mr. Ives is now in Europe, I would advise him not to forget European work done before him in the same direction. Mr. Ives published his experiments in the so-called "isochromatic photography" in 1889, that is, six years after my investigations, and he employed no new process, but Becquerel's chlorophyll, used by the French *savant* four years ago for proving the correctness of my theory of "optical sensitisers."

I call attention here to Mr. Ives' own words in your JOURNAL, 1891, p. 104: "In 1873 Dr. H. W. Vogel discovered that bromide of silver can be made sensitive to the less refrangible rays of the spectrum by treatment with certain dyes, &c." Further on he quotes Mr. Bothamley's remarks in the *Journal of the Society of Chemical Industry*, 1887: "In 1873 Dr. H. W. Vogel discovered that if certain dyes, such as coraline or aniline green, are added to a sensitive dry collodion film, the film becomes sensitive to yellow." I think that this testimonial will be sufficient to show whether the assertion of Mr. Jennings about his "co-labourer," Mr. Ives, that the latter "fully realised that no light task was before him" is right or not.

That the principle of reproducing natural colours by combining the so-called three principal colours is a very old one (it was published in England and Austria simultaneously in 1865, and improved by Cros and Ducos du Hauron) Mr. Ives has acknowledged in his paper (*Journal of the Franklin Institute*, January, 1891).

I allow Mr. Ives the priority of having employed first those old principles for projecting lantern slides, but if he calls the attention to a new (?) printing process for pictures in "natural colours" he forgets wholly that I already gave, in 1885 in my handbook of colour-sensitive photography (*Die Photographie farbiger Gegenstände*, Berlin: Oppenheim, 1885, page 136) a new principle for printing in natural colours after Ducos du Hauron, but avoiding his failures with the so-called "complementary colours." My principle is, in short, that each of the three or more negatives taken for photographic purposes must be printed with the same dye I employ as optical sensitiser for the same plate. Mr. Ives has read this article but not understood it all, for the description he gives of my process in the *Journal of the Franklin Institute*, January issue, 1891, is totally wrong. He says I used *pigment* prints with colours *complementary* to the light. I mentioned that I rejected all theories founded on "complementary" light, for I have proved that any colour has not one, but several complimentary colours;* and, therefore, I rejected also in my printing process "complementary" dyes, and use only those which are employed as optical sensitisers, or, if these dyes will not keep, I take another one, which is spectroscopically absolutely similar to the optical sensitiser. Proofs of such prints were exhibited in the German Exhibition in South Kensington last year, and obtained the first prize. In the meantime, a company for working out this printing process in natural colours, published by me five years before Mr. Ives' patent of 1890, has worked this process in reproducing masterpieces of our most celebrated artists, such as Knaus, Menzel, &c., who never have given their works to chromo-lithographers for reproduction, and who were highly satisfied by the results of the Company mentioned.—I am, yours, &c.,

Berlin, May 9, 1892. DR. H. W. VOGEL.

DEPTH OF FOCUS: THE CONCENTRIC LENS.

To the EDITOR.

SIR,—Having been engaged some years ago in making improvements in photographic lenses, I take an interest in the above subject. The work consisted in a battle to obtain with a short focus the utmost sharpness of definition in the oblique pencils at the margin of the picture, combined with a flat field. The difficulty was so great that success was not achieved until a glass was specially manufactured for the purpose, the combination constituting an achromatic of two densities of flint, in place of the crown and flint then commonly known. This glass caused a peculiar refraction on the oblique pencils, by which they became elongated, and so produced a flatter and more extended field than had hitherto been obtained, associated with what is called "depth of focus."

In reference to the term "depth of focus" a great deal of misapprehension exists. Some say that this is an anomaly, meaning nothing else than an optical imperfection in an achromatic combination, which,

* *Berichte der Phys. Kalischen Gesellschaft*, Berlin, January, 1890.

to be perfect, should, as alleged, only give a distinct image in *one* plane. Others say that correct depth of focus is a myth, and has no existence in reality. There may be some truth in this assertion where, as in the compound microscope and telescope, the focal image from the object glass is taken up and magnified by an eyepiece of short focus and considerable power. But in the lenses used in the ordinary photographic camera no secondary magnification of an object occurs, but a reduced image is obtained on the screen itself; and depth of focus may exist to an appreciable degree, so that objects within twenty yards of the camera and distant ones may be equally well defined.

For a plain illustration, I may refer to the effect of a "pinhole stop" adapted to the camera, in place of a lens. This aperture is so small as to approximate to the effect of a single ray from each part of an object comprised in the view. As there is no optical focus, near and distant objects are all equally distinct to the utmost margin of the picture; but, of course, the small amount of light passing through an aperture of necessarily minute diameter renders the "pinhole stop" camera practically useless, even with the most sensitive tissues that can be employed; and further, as the "pinhole stop" cannot be so small as to include a single parallel ray only, but admits exterior or divergent ones, there is consequently a duplication of the image, which causes a blurred appearance in the picture.

Now, if we place a positive lens of very long focus behind the stop—say, the longest spectacle glass used (preferably of the meniscus or "periscopic" form)—the divergent beam of light from the "pinhole stop" will be brought nearer to a state of parallelism, and the depth of focus will still be approximately infinite. This condition will allow us to open out the stop, and so obtain a greater amount of light; but, to continue this operation progressively by such means with lenses of decreasing radius, we then get into all the difficulties of optical convergence, and are restricted by a real focus, at which point only definition can be obtained. The field or picture is no longer in a flat plane, but rounded, and the oblique pencils or margins of the picture are nowhere or obliterated. I give this illustration because, in the conditions of perfectly flat field, with equal definition to the very extreme that light can pass, and in what is known as depth of focus, the new "concentric lens" has all the properties of the "pinhole stop," but so perfectly are the rays combined that the full diameter may be utilised without loss of definition, thus giving an enormous increase of light in comparison. I felt so far interested in these lenses as to pay a visit to the optical works of Messrs. Ross & Co., at Clapham, and fully tested the lenses in question, and I was surprised by a degree of perfection in definition that I had never anticipated in photographic lenses.

The invention of this lens is due to Dr. Hugo Schroeder, who combines the rare qualification of intimate workshop, practical knowledge in optical matters with such high mathematical attainments in the same branch as to place him in the first rank as an optical mathematician; his manners are unassuming, and he is always willing and courteous in explaining his ideas. I recollect the first lens that he designed on the concentric principle. In the list of the Abbé Schott glass, then just issued, Dr. Schroeder noticed two examples of glass that if combined would give a result hitherto unattainable in a combination photographic lens.

After verifying the refraction, and dispersion, and optical properties by means of the very beautiful and accurate instruments of the firm of Ross & Co., Dr. Schroeder at once proceeded to calculate the formula with regard to the focus for central and oblique actinic rays in the entire combination, and so confident was he in the result that he said "it must come right." And so it turned out to be, not a single radius of curvature requiring to be altered.

The lens is appropriately called the "concentric" because the outside surfaces are so; but the singular peculiarity is that the inner surfaces of the lens, or those that face each other, are of shorter radius than the outer ones, so that any one, at first taking up the lens without looking through it, would say that it was a periscopic *negative*, and therefore could not give a focus of convergence or have any magnifying power, as the elements seem reversed. It is this peculiar form which portrays such a magnificent flat field, combined with the depth of focus, which I have illustrated by example of the "pinhole stop" experiment. This lens has been necessarily shelved for a few years, awaiting the certainty of getting the peculiar glass in quantity not to be obtained, and also to test its permanence in atmospheric conditions.—I am, yours, &c.,

May 9th, 1892. F. H. WENHAM.

THE CONCENTRIC LENS.

To the EDITOR.

SIR,—I note in THE BRITISH JOURNAL OF PHOTOGRAPHY the result of the trials of the new concentric lens being that "the new lens, with an aperture of *f*·20, covered an area of large angular magnitude—over 60° on the base line and about 80° on the diagonal—with great sharpness." I have been using the concentric for some days, and find that the stop *f*·16 gives such uniform sharpness as I have never been able to get with any other form of lens with any aperture, and that, except for objects in the *near* foreground, there is no advantage in stopping down to a smaller aperture than that of *f*·16. I have, indeed, sent back the tube of my lens to have it opened out to possible *f*·10, in hope that, if that will not answer for the practical landscape work, something between that and *f*·16 will be found as sharp as the ordinary printing of albumenised paper will require, and that the *f*·10 will give me a diffusion of focus for portraits in the open air which will satisfy the desire for a uniform "softness" of definition, which seems to be the *desideratum* with people whose ideal is the purely artistic, *i.e.*, the resemblance to the work of painting. At any rate, with *f*·16, I have such detail all over the plate as the printer cannot render for me, and with a lens of 6-inch focus on a plate 18 × 24 centimetres (9½ × 7 inches), the circle of illumination and definition goes beyond the longest dimension of the plate, so that I could cut an oval picture 9½ × 7 inches out of the print, sharp throughout, the diameter of the circle of illumination being 10 inches. This comes close on 90°, the Zeiss formula and manufacture, which we have from Berlin, giving 105° and a flat field, though the definition may be less perfect than with the Ross lens. The Roman amateurs generally are more taken with the Zeiss rapid anastigmatic, which, working with an aperture of *f*·7½, is adapted for instantaneous work, which is the *desideratum* here at present.

The favourite testing subject at our Club is the view from our terrace, giving, at the distance of about a mile, the Antonine Column, covered with delicate bas-reliefs, as all the world knows, with architectural details in the foreground in deep shadow, while the sky is crossed by innumerable telegraph wires in various directions. The use of a magnifier will show on the negative the details of the reliefs on the column, which cannot be distinguished with the naked eye, and the telegraph wires, whether they run perpendicularly across the field or diagonally, are as sharp at the edges of the plate as in the centre. The chief difficulty I have found with the lens is that of finding the absolute focus, it being difficult to adjust it within an eighth of an inch, so deep seems the focus.

The concentric lens is for pure landscape workers—a boon such as I could not have, *à priori*, believed possible, and I am still puzzled to understand how the new lens, worked at its largest aperture, can give so nearly equal illumination of the entire field. The use of the smallest stop only slightly enlarges the field and makes the line of demarcation more decisive; but the difference is very slight, though it is the only one by which I can invariably tell whether I have used the stop of *f*·16 or that of *f*·64, the loss of definition in the foreground in the former case being only noticeable when the objects are very near, say twenty or thirty feet. I have several times made negatives with the largest and smallest stops, and been unable to distinguish afterwards which was which. So I think your trials of the lens will give you something brighter than can be got with *f*·20.—I am, yours, &c., W. J. STILLMAN.

Rome, May 8, 1892.

[While we are entirely at one with Mr. Stillman regarding the desirability of having the largest aperture, even with a lower degree of definition, we still find that, with our concentric (which is two inches longer in focus than that of Mr. Stillman), the definition with *f*·20, or, more correctly, *f*·10, is better than that obtained with *f*·16.—ED.]

MR. A. DAWSON ON "PHOTOGRAVURE."

To the EDITOR.

SIR,—Will you please allow me to inform your readers that Mr. A. Dawson, of the Typographic Etching Company has kindly consented to deliver a lecture on *Photogravure* at the rooms of the Photographic Society of Great Britain, 50, Great Russell-street, Bloomsbury, on Tuesday, May 17, at eight p.m.

All those who are interested in the subject are invited to be present.

The Assistant-Secretary has organized a small exhibition of photogravures by English and foreign firms. These specimens will be on view from May 17 for a few days.—I am, yours, &c.,

CHAPMAN JONES, *Hon. Sec.*

Photographic Society of Great Britain, Great Russell-street, Bloomsbury, W.C., May 6, 1892.

"SENSITIVENESS."

To the EDITOR.

SIR,—With reference to the discussion that took place at the London and Provincial Association last Thursday evening on *Sensitiveness*, I may as well, with your permission, add that, if two ordinary bromo-iodide gelatine emulsions be made identical in every respect, except that ordinary commercial nitrate of silver be used for one and fused nitrate of silver for the other, the last will be found more sensitive than the first. I do not think that this has been pointed out before, which is my excuse for troubling you.—I am, yours, &c., J. BARKER.

May 7, 1892.

MR. I. GOODSTEIN sends us a circular, in which he informs us that he has "been appointed by the Photographic Society of Great Britain to superintend the hanging of pictures from exhibitors for the annual exhibition," &c. This statement is altogether incorrect, the superintendence of the hanging of the pictures being delegated by the Society to a small Committee of its own members.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:
Messrs. E. Green & Son, Limited, Manchester.—*Photograph of Mechanism.*

A. J. SIMPSON; H. J. CHANNON; ALFRED WATKINS; G. H. SLIGHT; WM. MATHEWS, and others.—Received. All if possible in our next.

Y. G.—The convergence of the lines is caused by the camera having been tilted.

L. M.—We do not know the price of the book; it is published by Messrs. Jas. Cornish & Sons, of London and Liverpool.

T. R. J. asks: "Is there any solvent for bichromatised gelatine that has been fully exposed to light?"—Try a solution of glacial acetic acid, or a strong solution of caustic potash.

M. CASELY.—Formulæ for the wet-collodion process will be found in the ALMANAC, but space in this column is far too limited to give anything like working details. See London and Provincial report in this number.

C. E. H.—Threaten the man that if he does not return your specimens you will communicate with the Superintendent of Police of his town. If this threat is of no avail, lay a statement of the case before the Superintendent.

SUBURBAN asks if there are good subjects for photography in Kew Gardens, and, if so, is any special permission needed to use a camera there?—Some nice bits are to be had in the Gardens, but a ticket to photograph is required. One may be obtained by application, by letter, to Mr. Thistleton Dyer, at the Gardens.

ALPHO.—Unless you are going a longer sea voyage than just crossing to the Continent, there will be no necessity to have the dry plates packed in a metal-lined case. If the voyage be one of many weeks or months the case is different. Of course there is no objection to the extra protection if cost is not a consideration.

A. M. (Edinburgh) says: "Would you kindly let me know where I could obtain the formula (Mr. Willis's) of the platinotype process of which you speak so highly in last week's number, as I should like to try it exceedingly."—You may obtain the paper and all necessary particulars of the Platinotype Company, Southampton-row, W.C.

R. C. GASSIOT writes:—"I bought a Steinheil 5×4 hand camera and three slides a little while ago and the slides were damaged at the zinc parts. Can you inform me who could do the repairs necessary. I have tried ——, but he thinks it impossible to get them repaired."—Probably some of our readers can give an answer to the question.

A. SIMS sends some examples of his retouching, and asks our "candid" opinion thereon. We regret that we cannot express a very favourable opinion of the work. A great deal of labour has been expended, only to mar the photograph. All rotundity is destroyed, and the face rendered smooth and flat, while the likeness is completely altered. The untouched picture is by far the better.

R. ROACH says: "I want to take the interior of a room that is very dark, having only two small windows of stained glass. I can have the incandescent lights going, but I am afraid the exposure will be excessively long. Would these lights be of any real service?"—The incandescent lights will certainly be of some help; but the best way will be, after the plate has been exposed for some time, to supplement the light with a little magnesium.

A. R. R.—If you are going anywhere on the Continent, except Belgium or Holland, we should advise you to provide yourself with a passport; not that it may be really necessary, but under some circumstances just now it may possibly save some little inconvenience in some parts. One may be had from the Foreign Office by simply filling up a form which is supplied, and having it attested by a banker, magistrate, physician, &c. The cost is but two shillings, and it does for all time.

A PROFESSIONAL.—We do not wish to say anything to wound your feelings, but, from a careful study of your letter, we conclude that the cause of your customers leaving you and preferring the services of your rival may be found in what you rather mistakenly call your independence of manner. An independent spirit is an excellent thing, but it must be largely diluted with tact and suavity when dealing with customers. Never forget the golden dictum that "more flies are caught by molasses than by vinegar."

EMIL A. (Paris), writes, asking whose plates, of English make, we consider the best, and whether they are any better than those made in France?—Our correspondent is probably unaware that it is quite against our rule to express any opinion on the merits of different makers' goods. As to whether English plates are considered better than French ones, that may be, and is, quite a matter of opinion. From the fact that large numbers of English plates are exported to France, it is clear that some people think they are.

HERTS says he is an amateur, and has taken several negatives of friends, and they have ordered copies therefrom. He asks what he ought to charge per dozen, *carte* size. Hitherto, he says, he has charged half-a-crown, but thinks this is not enough.—It is difficult to see how our correspondent can style himself an amateur, seeing that he is trading in portraiture. He should arrange his prices according to the quality of his work and those of *bonâ-fide* professionals in the neighbourhood. But let him no longer class himself as an amateur photographer.

C. WITLEY sends us some pictures with red stains upon them. He says: "These prints have only been done a few days, and you will notice in the delicate portions of them, and in some cases on the faces, a pronounced red staining, though it does not show on the shadows. Can you in any way explain the cause?"—The stains are caused by the mounts. The reddish-brown "enamel" used to surface the cards contains a red pigment that is soluble in water. Hence, when the wet mountant comes in contact with it, solution takes place, and the print becomes stained as complained of. Some brown mounts are very prone to stain the pictures.

F. T. says: "1. *Re* query of last week, my invention is *not* an ordinary actinometer, but an instrument attached to the camera, which works automatically. The only thing necessary is to take cap off lens, and leave it off, the instrument giving a correct exposure to the plate, in any intensity of light, to a fraction of a second. Would this make a successful patent? 2. Can you kindly favour me with the address of Captain Abney? 3. I have taken three negatives of the interior of a church, and on one side of the plates, where a strong light comes between two pillars from a window, there is fogging on one side of the pillars next to the camera. I have examined the camera, which is quite light-proof. Can you tell me the cause of this? Is it the flood of light from the window?"—1. If the instrument does all that you claim, it would assuredly form the subject of a valid patent. 2. South Kensington Museum. 3. Undoubtedly.

BRIXTON AND CLAPHAM CAMERA CLUB.—May 17, *Photo-micrography*, Dr. T. Charters-White.

FALLOWFIELD'S *Remembrancer* for May has reached us, and is, as usual, replete with bargains and the latest things out in photographic manufactures.

PHOTOGRAPHIC CLUB.—May 18, *Reversed Negatives*. 25, *Developers for Bromide Prints*. Outing, Saturday, May 14, Hampton Court. Train from Waterloo at ten minutes past two.

ERRATUM.—In the paragraph on electrotyping in Mr. T. Symmons' paper published in our last, it should have been stated that the copper skin is formed on the wax mould, and the white metal is poured into it after the wax is taken away.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—May 19, Monthly Lantern Night and some New Hand Cameras. 26, *The Photographic Study of Clouds and Lightning*, illustrated by slides, Mr. A. W. Clayden. Visitors are welcome.

CHICAGO EXHIBITION, 1893.—The Royal Commission announce that applications for space in the British section can only be received up to Saturday, May 21. Any applications received after that date will be filed, in case of any space becoming hereafter available, but will not be included in the first allotment.

HOLBORN CAMERA CLUB.—Arrangements for May and June:—May 13, *Exposure*. 14, Outing to Epping Forest. Meet at Chingford Station at three p.m. 27, Lantern Night. June 3, *Hints on Landscape Photography*, Mr. H. West. 6, Whit Monday, Outing to Penshurst, Kent. Meet at Charing-cross Station at nine a.m. 10, *Development in Practice*, Mr. E. Clifton. 11, Official Outing to Pinner. Meet at Pinner Metropolitan Station at three p.m. Tea at the "Swan," Ruislip, at seven p.m. 17, Mr. A. J. Golding will lecture and demonstrate on *Carbon Printing*. 24, Lantern Night. Mr. Hodge's slides. Members, please bring your slides and your friends.

CAMERA CLUB FIXTURES:—Monday, May 16, Exhibition, Description, and Discussion of Hand Cameras. Thursday, May 19, Mr. H. P. Robinson, *A Note on Fading, and our Debt to Science*. Monday, May 23, 1. *On Varying the Colour of Platinotype Prints*, by Mr. Rowland Briant. 2. Discussion of Exposure Meters. Messrs. Hurter & Driffield's Actinograph, described by Mr. A. Cowan; Watkins' Exposure Meter, described by Mr. Watkins. Thursday, May 26, Mr. W. Willis, Demoustration of the New Cold Development Platinotype Paper. Monday, May 30, Exhibition and Discussion of Shutters. Thursday, June 2, Mr. A. F. Stanley-Kent, M.A., *Practical Photo-micrography*.

WITH reference to the proposed exhibition at Lincoln of the pictures by English photographers lately on view at Brussels, we learn that nearly the whole of the exhibitors have sent favourable replies to the requests made. The gallery of the School of Science and Art, at the disposal of the Committee, is almost as large as the Pall Mall one, and there are other rooms, and the lecture theatre for lantern exhibitions is also at disposal; so that, beside the show of photography in the principal gallery, there may be joined a lantern exhibition, as well as demonstrations in photography in another room. Possibly other artists will be invited to forward a small selection of their best work, but the Brussels exhibits will be kept to themselves, as a special show. There will be no prizes or awards.

CONTENTS.

THE BRITISH
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PHOTOGRAPHY AT THE ROYAL SOCIETY'S CONVERSAZIONE.

A more conspicuous example and valuable proof of the great value of the unique position occupied by photography in so many branches of science could not be wished for than that shown at this conversazione. We do not suggest that it formed the apotheosis of the science; but, if proof were needed of the paramount importance of its various modifications, it could be found a hundredfold in the photographs in a multitude of phases that were exhibited on Wednesday, the 4th inst.

Let us first name the astronomical exhibits. Mr. Lockyer had on view a fine spectrum photograph, enlarged twenty-five diameters, of the new star in Auriga taken by a six-inch object glass by the Messrs. Henry, using one of Hilyer's prisms. Also he showed several excellent spectra of stellar objects illustrating points in the meteoric theory. He had, further, photographs of the large reflector (nearly three feet) at Kensington, which is now nearly completed. Mr. Roberts showed various photographs of celestial objects, including the original negative of the Nova Cygni taken with a twenty-inch reflector, the exposure being two hours.

The Solar Physics Committee exhibited what is considered the best series of sun-spot pictures yet produced. They included the great sun-spot visible last February.

Of physiographic interest was the collection of pictures, over a hundred, illustrating coral reefs, coral animals, and the marine fauna generally of the Great Barrier district of Australia. One point of interest in connexion with some of these views was the fact that accurate measurements of some of the reefs photographed had been taken, and thus further growth could be exactly measured.

The archæologists would find much to interest them in the views of Central American monuments and buildings from the ruins at Chichén Itzá (Yucatan), while the anthropologically minded could study the development of racial qualities in a series of over a hundred views of a wrestling match between a black and a white man, the representative of civilisation evidently getting the worst of it.

Students of artillery were afforded an opportunity of examining a remarkable instrument for measuring the velocity of projectiles. In connexion with the electric tram, chronograph photography was utilised to obtain the measurement of the velocity of projectiles, and small periods of time in physiological research, and to the photography of insects and falling drops of liquid. The electric spark is the illuminant, the plate being fixed in a "carriage" forming part of the instrument.

Mr. Boys' name is already familiar from his study of falling drops, aided by photographic means; and at the conversazione his exhibit was, perhaps, the most unique among many truly remarkable ones. They consisted of a series of photographs of bullets shot from a rifle taken by a modification of the old method. The remarkable point in the views was the air waves caused by the rapid flight of the projectile; they appeared in the photograph like the waves produced by a steamer when steaming fast ahead. One slide actually showed the small particles of paper torn out of the screen as the bullet passed through. They were seen rushing through the air, and producing their own air waves, quite as clearly shown as those of the bullet itself. A bullet passing through a wire was photographed, the camera seizing the piece of wire broken off before it had time to fall. A photograph of a magazine rifle bullet piercing a sheet of glass was also to be seen. All the particles and splinters of glass were taken, and, strangely enough, their direction of motion was opposite to that of the bullet itself. Some idea of the neatness and skill required to execute these results will be formed when we state that the various rapidities with which the bullet travelled were from 750 to 3000 feet per second. There was a remarkable exhibit, mention of which, from its connexion with optical or, at any rate, ocular matters, should not be omitted. It was an electrical retina, and shown by Professor Oliver Lodge, and possibly illustrated the meaning of the well-known rod and cone system of the retina of the eye. Radiation from spheres which were in a suddenly disturbed and oscillatory electrical condition were made to fall upon a graduated series of end-on cylinders, which responded by vibrating transversely.

There were many other noteworthy objects too numerous to mention in this brief survey; but we have, we are assured, already more than shown how great a part photography plays in science at present; what it may not do in the future it is difficult to prognosticate.

A QUESTION OF EXPOSURE.

It was commonly said, in the early days of gelatine plates, and no doubt with perfect truth, that half the plates were spoilt by over-exposure, for it was difficult to realise all at once the great advance that had been made in sensitiveness. Moreover, at that time, the plates themselves were not of the character that would bear to be taken liberties with, and comparatively slight departures from the proper exposure, aided by the then less perfect knowledge of alkaline development, sufficed to produce failure. Over-exposure gave results, however, less disastrous than the reverse, and, as it also tended in the direction of a peculiar kind of softness and delicacy of detail unfamiliar to workers of the older processes, it grew almost into a habit, until the cry of want of "sparkle" set photographers to work to attempt better results.

Nowadays, perhaps, the tendency is quite in the opposite

direction, for the great fuss made about the "new instantaneous process" has so imbued the minds of new workers with the idea that everything must be done with the drop shutter, that snap-shots have become paramount, and nothing that is not 'instantaneous" is considered by many worth attempting. The consequence is that a far larger proportion than half of the prints one sees produced by amateurs of the present day are spoilt by under-exposure, and have not even the merit of being interesting as *coups de main* or studies, since all the work except the development is performed by the shutter and the subject.

Since the now general adoption of exposure tables and meters, it might be thought that errors in exposure would cease; but there are various circumstances to be taken into consideration as explaining the reason why it is not so. In the first place, it should be remembered that, however perfect may be the instrument, the tables, and the system of calculation employed, there must always be something left to "judgment;" and too frequently the personal element intervenes to upset their accurate work. Again, while very many—perhaps it would be more correct to say the vast majority—do not use any of these extraneous aids to correct exposure, those who do are too prone to take the actinometer and its tabular assistant quite literally, or perhaps even to strain a point or two in order to make the exposure as short as calculation will possibly permit; and thus, while firmly believing that they are working by correct rule, they are in reality under-exposing.

Now, there is really no necessity—no excuse—for systematic under-exposure except in the case of subjects that must, perforce, be taken with some form of rapid shutter; and even here the practice should be confined to subjects that are worth it, or rather to subjects whose interest lies outside the bounds of pictorial art, for what value, artistic or otherwise, can attach to a photograph that is technically imperfectly executed? For scientific or other purposes it may be necessary or desirable to secure transcripts of scenes or incidents that require the use of the quickest shutters, but no artistic treatment—whose sole value, in fact, consists in their being accurate and indisputable evidence in a graphic form. Here under-exposure may be excused, nay, must be tolerated, since it is probably "Hobson's choice" in most cases.

There is, perhaps, some excuse, though no necessity, for making excessively rapid exposures when the artistic character of the result would suffer more from the movement of the objects portrayed than from the want of technical perfection in the photograph; but such subjects are extremely rare, as most moving scenes or groups that present any features of artistic or other interest can be readily secured with exposures of such comparatively long duration that, with suitable lenses, will give a photographic result of good, if not of perfect, quality.

In the pre-gelatine days there was not only every excuse for shortening the exposure as much as possible, but often it was practically impossible to expose long enough. The drop-shutter men of to-day know little or nothing, most of them, of the days when exposures running into *minutes* in full summer sunshine, or perhaps into hours in diffused light under less favourable circumstances, were by no means unknown to the workers of dry plates; and when, even with the quickest wet plates, an open landscape might require twenty or thirty seconds. There hangs not far from us as we write a photograph of somewhat large size, taken about a quarter of a century ago, an open view, which received, if we remember rightly, an exposure of an hour and twenty minutes, but that was before lenses of the modern "rapid" type had come into general use. Another instance we remember of an amateur who wished to get the interior of a church for the vicar, and who, after one or two unsuccessful efforts, was reduced to the necessity of setting up his camera after service on Sunday evening, as it was inconvenient to do so on Monday morning, and leaving the plate to expose until he was compelled to remove it in time for service on the following Wednesday evening; and, even then, owing to the non-actinic colour of the glazing, the time was far from sufficient.

Then, we repeat, little blame could attach to any one who curtailed his exposures to the utmost possible limit; yet there was far less done in that direction than at the present day, for the amateur of the period was a steady-going methodical being, whose object was pictures—results worth showing. Looking back at some of the best-known and remembered workers, both wet and dry, and with whose works we are familiar, they are invariably men who favoured long exposures; and we venture to assert that, if the best pictures, wet or dry, of bygone times could be examined, and the details of their production given, they would all be found to have had long exposures.

We were present at an out-door meeting of one of the London Societies a few years back when one of the members was making drop-shutter exposures, the subjects being pure landscape. Another member, an "old stager" of the wet-plate days, rallied him on the subject, delicately hinting that he could scarcely hope to get any decent results with such short exposures. Our shutter man argued the point, averring that with the light and general conditions prevailing a fraction of a second was quite sufficient for *him*, and finished up by pointing at the landscape before them and exclaiming, "Now, then, look there! You could do that in a tenth of a second." "Oh, yes!" was the dry reply; "I could *do* it, *but I don't want to waste a plate.*"

While there is nothing, beyond what we have already admitted, to be said in favour of curtailing the exposure, there is very much, if not everything, to recommend the giving of a full exposure even if it should extend as far as slightly *over*-doing it. Without making any great use of the hackneyed phrase, "latitude of exposure," we may remark, and few will contradict us, that a variation of ten per cent., or even more in the exposure, in excess of what is absolutely necessary to give a first-class result, will have absolutely no effect in depreciating the quality of the result, and very much greater departures may be made from the normal with practically no ill effect if the plates be good ones. The plates which suffer most seriously from slight over-exposure are not, as many suppose, those that are most rapid, but those which suffer from some defect in preparation, chiefly from want of "body," but also from some kinds of inherent fog. A well-coated and clean plate will stand a considerable amount of exposure in the camera in excess of that absolutely necessary without showing any ill effects; not so in the case of under-exposure, for every fraction of a second of deficiency means a corresponding deficiency in the action of light, which cannot be made up by any modification of development. Therefore, while there is no inducement to, or excuse for, under-exposure—except the ill-judged rage for "snap-shotting"—there is, on the contrary, every reason for giving a full and a fairly good excuse for over-exposure, if habit should gradually lead in that direction.

But, it may be asked, what are the advantages, or, rather, what is the use of running the risk of over-exposure, when a

correct exposure will answer perfectly, and can be arrived at by means of calculation? Well, the use, the advantage, is just this, that, as slight over-exposure does no harm, it will keep us on the safe side of accidents, at any rate. Nothing or nobody is infallible, whether we look at actinographs and tables or at human beings. The former may be perfect as machines, but, to some extent at the mercy of the "judgment" of the latter, they are helpless to secure perfection in the results given. If, therefore, an error occur on the *under* side, a barely sufficient exposure becomes converted into under-exposure, which is bound to damage the quality of the result. With an already slightly excessive exposure, another small error in the same direction matters very little, and therefore, we claim, no possible harm can be done, but good may result, from systematically adopting our recommendation.

As an illustration of this, some years since we had a "day out" with the camera, the slides being partly filled with "Instantaneous" and partly with "Ordinary" plates, which differ very considerably in sensitiveness. By an error, which we did not detect until we came to develop, we found we had wrongly exposed the two kinds of plates, which had been placed, the one in the earlier numbered slides, and the others in the later; but we had somehow mentally reversed them, and the slow plates had had the shorter exposures. However, thanks to our invariable habit of giving full exposure, they had had sufficient, while the more rapid ones, with far longer exposures, were well within bounds of development, and every plate of the dozen made a good negative. If our practice had been to give the shortest "correct" exposure possible, one-half of the plates would have been lost.

But, further, there is this to be borne in mind, a well-exposed plate develops more rapidly and with a weaker developer than one that has been only just sufficiently timed. Consequently, it is exposed for a shorter period to the chances of fogging by light in the dark room, or of staining by the developer, and any slight fog that exists in the film itself is less likely to be brought out than would be the case when the development required to be more prolonged or more energetic.

We might go on enlarging on the advantages of systematically giving what is termed a "full" exposure, which we ourselves consider a proper though others may deem it an over-exposure; but we think sufficient has been said to show the unwisdom of adopting the opposite course. However, as the season is about opening, we beg our readers who have not already done so to try the plan, and compare the results with those obtained by cutting the time as fine as possible.

Mr. Valentine Blanchard.—This veteran photographer, who has been honourably associated with many phases of the art science for a long span of years, is about to retire from active photographic work. Mr. Blanchard has always identified himself with the art aspects of photography, upon which his dicta have commanded general respect. He will, in future, reside at Harston, in Cambridgeshire, with the intention of devoting himself entirely to literature, as a profession, into which we are sure he will carry the good wishes for success of his many friends.

Mr. Ives' Second Lecture.—On Tuesday last, at the Royal Institution, Mr. F. E. Ives delivered his second lecture on *Photography in the Colours of Nature*. The syllabus was as follows:—Sensitive plates and selective colour screens used in composite heliochromy—Special cameras for composite heliochromy—Different methods of superposing the three coloured images—The triple lantern—The heliochromoscope—Permanent colour prints—Exhibition of results by optical lantern projection. A number of very effective views of Yellowstone Park were projected on the screen, as also the picture of a bunch of multi-coloured flowers. The latter, it was stated, was taken on an Edwards's Isochromatic Plate.

M. Lippmann's Latest Advances.—Before the Académie des Sciences on April 25, M. Lippmann stated that using albumeno-bromide plates, orthochromatised by azaline and cyanine, he had obtained brilliant spectrum colours, including red, without the interposition of coloured screens, and with an exposure of from five to thirty seconds. Two of the plates viewed by transmitted light showed the colours complementary to those seen by reflection. He showed four plates, having faithful representations of a coloured window in red, green, blue, and yellow; some coloured drapery; oranges and poppies together; and a multi-coloured parroquet. The drapery and the bird had an exposure of from five to ten minutes in electric light and sunlight, the other objects taking some hours in diffused daylight. A blue sky was rendered on the plate as indigo.

"How to ascertain when the Fixation of a Silver Print is Complete."—Had that amusing conception of the novelist's brain, Mr. Richard Swiveller, been a photographer, he would surely have characterised a question from the box, which was read at the last meeting of the London and Provincial Photographic Association, as an "unmitigated staggerer." The questioner wished to know "how to ascertain when the fixation of a silver print is complete?" The information forthcoming constituted no clear answer to the question, which, it appears, was put to the students who sat for a recent City and Guilds Institute examination in photography. It was finally decided to ask Mr. Lyonel Clark, the examiner on that occasion, to furnish the answer to his own question "for the benefit of photography." Photographers, we are sure, will be very pleased to have the information.

"Natural-Photography."—As a result of several years' experimental work, and aided by eminent opticians and others, Herr Eugene Hackh, of Stuttgart, has, it is said, succeeded in perfecting a method of taking instantaneous portraits in the size of the original, and, we suppose, larger if necessary. Inasmuch as the method is to form the subject of a patent in this and other countries, no details are yet available, but it seems that M. Hackh employs an artifical illuminant of his own invention, which is ignited by explosion, without casting harsh lines on the face of the sitter or inconveniencing him in any way. The full power of the light is utilised by a special system of reflectors, of which we are unable to obtain any particulars. The results are spoken of by painters and others as possessing great artistic merit, while practical photographers are said to regard the process favourably. It is even hinted that it will interfere with the business of professional enlargers. We shall see.

Photographing on the West Pier, Brighton.—In reference to Mr. George Grossmith's recent passage of arms with the authorities of the West Pier, Brighton, who, being unaware of his distinguished identity, refused to allow him to take photographs from that structure, we are informed that the necessary permission is granted on payment of 2*s.* 6*d.* This is about 2*s.* 4*d.* too much to an ordinary member of the public, and, on the authorities' own showing, exactly 2*s.* 6*d.* in excess of the charge to be expected from a popular comedian. Evidently, kissing goes by favour at London-super-Mare. We understand that the restrictions on photography in Preston Park have been withdrawn for the present, although the use of the camera is still interdicted in Steyne Gardens. It would be an admirable thing if Photographic Societies at popular places of resort would make it their business to endeavour to remove the rules against the taking of photographs on piers, &c., where the holiday-makers most do congregate.

Photogravure.—There was a capital attendance at the Photographic Society of Great Britain's extra meeting on Tuesday night to hear a lecture by Mr. A. Dawson, of the Typographic Etching Company on *Photogravure*. If there was any expectation that Mr. Dawson would go into the practical details of the process which he and others work with so much skill and success, nothing but disappointment was the result. In that regard the meeting dispersed in just about the same state of wisdom as it gathered, Mr. Dawson contenting himself by confining his remarks to the economic and artistic aspects of his subject, and making brief references to the outlines of those photogravure processes which are to be found in all the text-books. There is a small but admirable collection of photogravure work on view in the Society's rooms which is well worth inspection, Messrs. T. & R. Annan & Sons, W. L. Colls, Paulussen (Vienna), the Typographic Etching Company, Annan & Swan, the Autotype Company, and Haenfstangel (Munich) contributing examples of their work. Messrs. Annan & Sons' reproductions of oil and water-colour paintings are, particularly the latter, extremely fine. Indeed, all the specimens are difficult to separate critically.

Painters and Photography.—It is usually very amusing testimony that is given by artists—painter artists we refer to—when they are called upon to give evidence, as experts, in a court of law. Notably was this so at Bow-street recently, in the case of Mr. Rudolph Blind's work, *The World's Desire*, as to whether it was an indecent picture. According to a report of the proceedings, Mr. Frederick Goodall, R.A., said, "You never got a perfect figure in nature. It was necessary to idealise. Photographs from the nude were offensive, and the proportions were always wrong." There is no gainsaying the fact that the majority of photographs from the nude are offensive—nay, more than that—but there is no reason why they should be, when artistically treated, any more than is a painting from the nude, similarly arranged. We have seen many that were less so than some paintings that have been publicly exhibited. Mr. Goodall says that proportions in a photograph are always wrong, and that you cannot get a perfect figure. Poor photography, and poor nature, both wrong again! If photography so misrepresents, why is it that painters make so much use of it in their work? Why do they have their models photographed? Why do they often paint their landscapes almost entirely from photographs? Surely they cannot use them to see what to avoid. The pictures to be seen in the different exhibitions—the Royal Academy, now open, not excepted—proves the contrary. Why, then, should painters decry that which is of so much assistance to them? But there, some do not, but graciously acknowledge its value to them.

OBSOLETE PROCESSES.

No. 2.—Calotype.

From the earliest time of working the calotype process, the invention of the late Mr. H. Fox Talbot, it was found that the paper employed—just as it is in the present day in all silver processes—was an important factor in the case. Unless it was of the right character, good calotype negatives were an impossibility. The make of paper most in favour with the majority of workers was that bearing the watermark of "Turner, Chafford Mill," which used to be supplied—if they were not the sole agents for it—by Messrs. Horne & Thornthwaite. Although this brand of paper was at one time in such high repute, it is now quite unknown in connexion with photography.

The first thing in the preparation of the paper was to iodise it, which was to obtain in, and upon, it a perfectly even coating of iodide of silver containing neither an excess of silver nor of iodine. This was done by treating it first with a solution of nitrate of silver of from fifteen to twenty grains to the ounce of distilled water. Different operators had different methods of applying the solution. Some applied it with a flat camel's-hair brush; but, as that was liable to disturb the texture of the paper—a very undesirable thing to do at this stage—the more favourite method was to spread it over with a glass rod. The paper was placed on several sheets of blotting-paper, then the rod was laid on one end of the paper to be prepared, and a little of the silver solution poured along it. Then the rod was passed to the other end with an even sweep, carrying the solution before it, the excess being driven off to be absorbed by the blotting-paper. The paper was then hung up to dry spontaneously.

When dry, it was floated upon a solution containing about twenty grains of iodide of potassium and four or five grains of cloride of sodium to the ounce of distilled water. The time of floating was of importance, inasmuch as, if the paper were left too long on the bath, some of the iodide of silver first formed would be redissolved, iodide of silver being soluble in excess of iodide of potassium. The time allowed was generally from thirty to forty seconds only. When removed from the bath, and slightly drained, the paper was laid horizontally—face upwards, of course—so that the solution would be evenly absorbed, and thus convert the whole of the nitrate into iodide of silver—an important point—otherwise marks or stains would arise when the negative was developed.

Now, it will be seen that the paper, at this stage, contained not only the iodide and chloride of silver, but also the nitrates of potassium and sodium, resulting from the double decomposition of the silver nitrate with that of the potassium and sodium salt, as well as an excess of iodide of potassium. All these substances had to be removed before the paper was sensitised, and, as the outer layer of iodide of silver was but loosely adherent to the surface of the paper, this had to be carefully done. When the paper had laid till it had become partially dry, it was floated for ten minutes or so, face downwards, on one or two changes of distilled water. After this treatment, the paper was dried, when it had a perfectly even coating of the yellow iodide of silver. In this condition the paper would keep for a long period without deterioration, provided, of course, it was preserved in the dark; hence it was usual to prepare a good stock at a time.

For use the paper had yet to be sensitised. This was done with "gallo-nitrate of silver." Two solutions were prepared, one a saturated solution of gallic acid in water; the other, forty grains of nitrate of silver and one drachm of acetic acid to the ounce of water, distilled water being used in each instance. These solutions had to be mixed in equal proportions just before they were applied to the paper, as after mixing they rapidly decomposed. There were several methods of applying the sensitising solution. The most common one was to place a clean glass plate, somewhat larger than the paper to be treated, upon a levelling stand, and pour on, and evenly distribute it with a glass rod, the mixed solutions. Then, taking the paper by the opposite corners, it was gently laid on the solution, in the same manner as in sensitising albumen paper, when it was allowed to remain for from ten to twenty seconds. It was then floated on, and finally washed in several changes of distilled water. The paper, when sensitised, would not keep more than a day or two, in hot weather less. It was usually exposed, while still moist, between glass plates, which served the double purpose of keeping the paper flat and preserving it in a moist condition. Double dark slides, similar to those now in use, were generally employed for the purpose.

If enhanced sensitiveness was desired, a stronger solution of nitrate of silver was used, and the exposure made immediately after preparation, as, the more sensitive the paper was rendered, the shorter time it would keep. As compared with the modern plates, the exposure was very long, but with a portrait combination and a good light a portrait could be taken in the studio in from twenty to sixty seconds. With a landscape lens having an aperture of about *f*-30 out of doors, the exposure would be from three to ten minutes in a fair light. If the exposure had been very full, or the paper was kept for some time between exposure and development, a more or less faint image was visible on the paper when removed from the slide by reason of the developing action of the gallic acid present.

The developing solution was similar to that used for sensitising, namely, gallo-nitrate of silver, except that, generally, it contained rather less silver. It was usually applied in the same manner—the solution was poured on a glass plate, and the print floated face downward upon it. If the image was tardy in making its appearance, as it used to be when the temperature was low or the picture was underexposed, heat was applied. A hot iron was usually held an inch or two from the back of the paper. Sometimes the heat was applied locally, to force out detail in the shadows that could not otherwise be obtained.

As soon as the development was completed, the negative was quickly washed in several changes of warm water, to stop further action of, and to remove, the developing agent. Then it was pressed between folds of blotting-paper, to remove all excess of water before it was put into the fixing bath. That was simply a dilute solution of hyposulphide of soda; an ounce of the salt to a pint and a half of water was about the usual proportion. The time of immersion was from five to ten minutes. After removal from the fixing bath, the negatives were again pressed between blotting, to get out as much as possible of the solution before they were put into the washing water. During the washing it was very customary to blot the pictures off between each change of water. After washing, the pictures were dried, and, very frequently, ironed with a hot laundry iron; and, to facilitate printing and also with the view to ameliorate the granularity of the paper they were often rendered transparent by waxing.

By the calotype process, notwithstanding its troublesome manipulation, its slowness, and the fact that the negatives were on paper, good pictures used to be obtained, which would yet bear a fair comparison with those produced nowadays, particularly if they are of large dimensions.

AMERICAN NOTES AND NEWS.

Death of Mr. J. Moss.—We are sorry to learn of the death of Mr. J. C. Moss, the founder of the Mosstype Engraving Company, New York, said to be one of the largest firms of its kind in the world. Mr. Moss commenced his experiments in process work so far back as the year 1858. The method which his Company has been so extensively working for many years was not patented, some of the most important elements in it being, it is stated, not of a kind that a patent would protect. Mr. Moss was only fifty-four years of age, and owed a large share of his success to the assistance and devotion of his wife.

"Aristotype" in America.—Collodion and gelatine emulsion papers, which so far, in this country, have not secured more than a moderate share of public favour, appear, in America, to have obtained very great popularity. Their manipulation and treatment form the chief topic of discussion in the photographic papers just now, and the portrait studies which our contemporaries delight to present to their readers are generally printed on aristotype. The competition and rivalry among the makers of the various commercial brands is very keen, which the *American Journal of Photography* thinks should surely produce a perfect paper in the near future. This rather discounts the qualities of commercial papers at present available.

Complicated Formulæ.—In two of our American exchanges we find protests against the multiplicity of ingredients included in many of the formulæ given for the combined toning and fixing bath for prints of the emulsion class. One of these extraordinary baths is made up of hypo, ammonium sulphocyanide, lead acetate, alum, acetic acid, citric acid, lead nitrate, gold chloride and water, in all nine substances. We can fully understand the part that each of these bodies is supposed to play in toning and fixing, but we strongly question whether the individual action really takes place; and, even if it did, we don't admit the necessity of it. Such formulæ are perplexing and troublesome in the extreme, and we shall do our best to discourage the epidemic of faddishness and mock photo-chemical science which is responsible for their production.

To Remove Silver Stains from Negatives.—The *Scientific American* indicates the following as an effective remedy. Having dissolved off the varnish, mix the following solutions, and apply:—

A.—Ammonium sulphocyanide	½ drachm.
Water	1 ounce.
B.—Nitric acid	½ ounce.
Water	1 ounce.

A fresh solution should be made for each negative, which should be finally washed and treated with chrome alum. Perhaps our many correspondents who, are constantly asking us to indicate the best means of removing silver stains from negatives without injuring the deposit, will try the method suggested.

Prices in Canada.—According to the *Canadian Photographic Journal*, the photographers of Ottawa lately came together, and agreed not to work at less than three dollars per dozen pictures, cabinet size, we suppose. We learn from our contemporary that at present work is being done at ruinous rates in various parts of the Dominion, and especially in Ontario. In Quebec better prices and more harmony prevail among photographers, but elsewhere the hostility to the "cut-throats" and "Cheap Johns" is of the bitterest nature. There are many English photographers who will be able, without much effort, to sympathise with the feelings of their Canadian *confrères*. We also gather that the Canadian dealers have adopted a slightly increased price-list, the list being signed by every dealer of note in Canada. Some dealers would like to accomplish the same sort of thing in this country, we believe.

A New Toning Bath.—Mr. John R. Clemmons, of Philadelphia, has lately been experimenting with the aluminium salts as toning agents for silver prints, and at the last meeting of the Photographic Society of Philadelphia showed some plain silver prints toned in the ordinary gold bath with the addition of aluminium chloride. Warm brown tones of great beauty, it is said, result with very clear whites. The bath is made up as follows:—

Aluminium chloride	20 grains.
Bicarbonate of soda	85 „
Water	12 ounces.

Half an ounce of gold solution 1 : 15 is added. It is stated that prints in a 1 : 6 hypo bath fix in about five minutes, and that there is but a slight change in the tone produced. The whites of the prints remain quite clear, and the details in the shadows are remarkable.

Inaccurate Description of Lenses.—Before the Photographic Society of Philadelphia, on March 9, Mr. W. A. Cheyney read a short and, on the whole, sensible little paper, pleading for a more accurate description, by the opticians, of photographic lenses. Theoretically, we agree with him that, in stating the covering power of a lens, it would be better to have indicated the diameter of the circle which is sharply delineated, instead of the size of the plate; but in practice we believe it would create confusion in the mind of the unreflective amateur, who, as a rule, understands his lens less than any other item of his photographic equipment. Mr. Cheyney quotes some manufacturer as saying that photographic objectives are not instruments of precision, and very neatly remarks that, if they are not, we are paying too much money for them. We hope, in defiance of Mr. Cheyney's assurance to the contrary, that it is the exception, and not the rule, that the stated equivalent foci of American lenses vary half an inch or so from the actual measurement.

[Since writing the above, we deeply regret to learn that while visiting New York, Mr. Cheyney suddenly dropped down dead while purchasing a ticket at one of the railway stations.]

A NEW FORMULA FOR THE DUSTING-ON PROCESS.

Comparatively few modern photographers have any practical knowledge of what is known as the "dusting-on process;" and, though it is frequently mentioned in these columns, it is very rarely that any attempt is made to arrive at an explanation of its meaning and uses. And yet it is a process that, more almost than any other of those not strictly falling within the lines of negative and print production as generally understood, lends itself to many purposes.

It is not so much in the direction of the production of vitrified enamels, enlargements, and reproductions on a large scale, and other similar uses to which it was originally put, that we may look for its adoption at the present day, but rather to the reproduction and modification of defective negatives, the introduction of skies and clouds, the production of opals, and even of transparencies of large size for decorative purposes, to all of which uses it is peculiarly adapted.

Although many formulæ have been published for the sensitising liquid—and several are given at the end of the Almanac—none have proved hitherto entirely satisfactory, except in the most careful hands. Of the various ingredients—gum, gelatine, sugar, glucose, honey, glycerine—some are more manageable than others. The best formulæ

are the simplest, and, if it were possible to work with only a single organic element, that method would be the one I should adopt. Unfortunately, however, this is not the case, as there are varying condition, to satisfy which necessitate the employment of different substances and not infrequently the alteration of their proportions.

Gum arabic has usually been the favourite substance employed to give body to the film, but it is inclined to present difficulties in coating the glass, and also to blister in the operations subsequent to development. Still it is better than gelatine, which either does not take the pigment freely, or else flies to the opposite extreme and takes it indiscriminately, causing smears and veil which utterly ruin the result. Of the hygroscopic agents, sugar and glucose—that is, cane and grape sugar respectively—has each its supporters, the latter being, perhaps, the one that exhibits most body, as well as undoubtedly the highest attraction for moisture. Honey, another form of saccharine, is in some respects, perhaps, superior to either, since its non-saccharine constituents give to it a "body" which renders it capable of use alone or in conjunction with glucose if care be exercised in the various manipulations.

The trouble experienced in using the saccharine substances alone, that is, without some non-hygroscopic matter, arises not from any insensitiveness or inability to form an image, but, perhaps, rather the reverse of the latter, the too great *readiness* to take the powder. A film of glucose and bichromate alone will *commence* development as satisfactorily as any by the most elaborate formula; but, owing to its highly hygroscopic character, a stage is soon reached at which it becomes unmanageable, owing to the rapidity with which it attracts moisture when the heat of the plate is entirely gone. The alternative is to be content with a coarse and "smudgy" result, or to be constantly redrying the film and starting afresh, which is, to say the least, a tedious and troublesome process. The presence of a little gum or gelatine, by hardening the film, reduces the tendency to excessive affinity for moisture, and so brings the manipulation within the range of convenience.

Chief among the mechanical difficulties must be reckoned that of securing a perfectly smooth film, entirely free from dust or other specks. It will be readily comprehended from the very nature of the process, both as regards composition of the film and modified development, that any inequalities of surface must be in the highest degree detrimental to success. As a matter of fact, a minute speck of dust in the film forms a nucleus round which, at every sweep of the brush, more and more of the powder collects, until the once scarcely visible point becomes a hideous blemish. This form of trouble arises in two directions: in the difficulty of closely filtering the viscid and syrupy solutions; and in the proneness of the coated film to attract and arrest floating particles.

In the first respect, an entirely new solution I have been recently using is far superior to any other I have hitherto tried, and it is, at the same time, free from the special faults peculiar to those substances I have already named. Indeed, it is not to much to say that it almost puts a new aspect upon the working of the dusting-on process, so greatly are the manipulations simplified.

The chief variation from the ordinary formulæ lies in the substitution of mucilage of linseed for the gum arabic or other non-saccharine matter, and with this may be combined either best English loaf sugar or, preferably, sugar-candy. Glycerine is frequently added to increase the affinity for moisture in specially dry weather, though I always prefer to submit to slower development, rather than resort to its use, when possible. More reliable than glycerine, however, I have found to be the finer grades of molasses known as "golden syrup," the particular sample I have used successfully being a highly refined kind, sold in tins, and known as "Lyle's golden syrup." The advantage of this over glycerine is that it is less violently attractive of moisture, and therefore less liable to "rush" the development when used in full quantity.

The formula I have been using consists of the following ingredients:—

Mucilage of linseed	20	ounces.
Sugar candy (or loaf sugar)	1	ounce.
Liquor ammoniæ fort.	½	"
Potas-ium bichromate	1	"
Golden syrup as required.		

The linseed mucilage is made as follows:—Take a moderately heaped teaspoonful of clean *unground* linseed, wash it in two or three changes of cold water to remove dust and dirt, and allow it to soak for some hours. The husks will then be found to be surrounded by a glazy mass of gelatinous mucilage, and the whole should then be transferred to an enamelled saucepan and raised to the boiling point, stirring well the whole time. After simmering for five or ten minutes, remove from the fire, and when ebullition has ceased, if the liquid be thick or "ropy," add more water and strain through fine muslin, while still quite hot, to remove the seeds. Afterwards filter more closely in front of the fire, to keep the liquid hot, and then allow to cool; and still further thin if it flows unevenly when poured on to glass. When quite cold add the ammonia, and, after some hours, again filter, and then set aside for some days, until the liquid becomes quite clear and bright and has deposited any flocculent matter that may be unremovable by filtration.

The bichromate of potash should be added in crystals a short time before required for use, and, if convenient, the solution should be heated, filtered, and used warm, a finer and more even film being obtained in that way. When newly mixed, the sensitive solution is a bright yellow orange colour, which gradually changes to a brownish tinge with age. It remains useable, however, if kept in a cool, dark place, for some days, but should be thrown away when very dark.

W. B. Bolton.

THE CAMERA AND THE CONVENTION; OR, PICTURESQUE SCOTLAND AND PHOTOGRAPHY.

III.

West from Edinburgh, Linlithgow stands out as the first place of interest. At Linlithgow Palace Mary Queen of Scots was born. Two or three hours can be well spent here. We remember seeing a very artistic view of this palace, with a bit of the loch in the foreground. It was a photogravure, produced by Mr. Balmain, of Messrs. Tunny & Co.'s, also from a negative of his own, we think. It was given as a presentation print by the Edinburgh Photographic Society. This picture must be familiar to many and it is a good illustration of what can be done at Linlithgow. There is the "Cross Well," and St. Michael's, a good specimen of the ancient Scottish parish church. The village itself is not picturesque.

On proceeding to Stirling we pass Bannockburn, but there is nothing of photographic value there. Of course, there's the "Bone Stone," in which the Royal standard was raised, still to be seen, but it is below the level of the ground, and protected by railings.

Stirling.

Stirling is a good centre, with its hilly town, its castle of renown, and its marvellous winding Forth. Some time should be allowed to do this historical place justice. The interior of the castle alone would supply a day's work for the camera. The view from the battlements of the castle is beautiful, and embraces a very extended area, the windings of the Forth, from this elevation, showing well, trailing and twining out and in like the twisting of a serpent. But, to enjoy the pleasures of this phenomenal stream, the best way is to come to Stirling by steamer from Granton, in a line of seven miles from Alloa to Stirling—these turnings take up a waterway of over twenty miles—and as you approach Stirling by boat the changing position of town and surroundings is very puzzling—now in front, now behind, changing every minute, until you begin to wonder if ever you will reach Stirling at all.

The castle and the town can be photographed from many points with advantage, so that a walk round before beginning to work will tend to the saving of plates, besides giving you the points that commend themselves to you as the most effective and pleasing. We have taken some good pictures of the town with the castle in the background, and the river Forth in the foreground—from near Combuskenneth Abbey. This abbey and surroundings are worth a plate or two, although the abbey itself is too square and plain for artistic effect. After photographing the places of interest in town, there is the Wallace Monument within an easy distance, and, a little further on, a good general view of Bridge of Allan may be had.

Bridge of Allan and Dunblane.

From Bridge of Allan to Dunblane there is three miles of river scenery rich in effects. Dunblane, as a village, is not any use photographically. The cathedral may be worth a plate or two, but it has been renovated lately, and not improved. From the other side of the water, with the river in the foreground, is, we think, the best point for a picture of the cathedral.

From Stirling a good day's outing may be enjoyed, going by rail to Rumbling Bridge at Dollar. The river Devon, in this vicinity, is rich in waterfalls and foliage, and, to be compressed into so small a compass, contains some of the most beautiful effects we have ever seen. Here, also, Castle Campbell, the old fortress of the Argyll family, stands, high up on the hill over the village of Dollar. It is a considerable pull up to the castle, but it is worth the trouble. Instead of by rail, we have driven from Stirling to Dollar, a distance of some twelve or fourteen miles along the base of the Ochil Hills, passing the villages of Menstrie, Alva, and Tillicoultry on the way. In the hills behind Alva there is a very picturesque glen and waterfall, where we have spent half a day very enjoyably with the camera.

Donne Castle and Callander.

From Stirling to Callander is about an hour's journey. On the way a halt might be made for a couple of hours at Donne, to get impressions of Donne Castle if desired. It is not easy to get pleasing pictures of this ruin, it is so square and plain; but, by crossing the river and ascending the hill opposite, we managed to get a good view of the side of the castle, the trees that grow on the embankment of the stream breaking in upon the long, straight lines of masonry, and giving a fairly successful result.

Callander is the flood-gate to some of the finest scenery in Scotland. It is a pleasure beyond compare to stand upon the bridge that spans the Teith and look upon the ever-varying landscape stretched before you, with shimmering rivers glistening in the sun, and shaggy hills that mount up from the plain higher and higher until reflected against the sky they reach a climax on Ben Ledi's head.

Callander as a centre would delight the lover of landscape for a long time. The nearest place of interest to the village is Bracklinn Falls. They are situated on the River Kelty, and are about a mile and a half distant. They are wild and precipitous, and form a very interesting study. From the river bed some of the best pictures are taken.

The River Leny.

The Leny is on the other side of the village from Bracklinn. It is a river that runs from Loch Lubnaig to the Teith. Loch Lubnaig is five miles from Callander, and the road to it is called the Pass of Leny. About a mile out from Callander we strike upon the Leny, which from this point runs close to the road all the way to the loch. Every foot of the way is filled with pictures of mountain and flood, of rapid and of waterfall. On the way, and nearer the loch, we come upon what is called the Chapel of St. Bryde. Once upon a time we went to photograph this chapel, being led to suppose that it was a ruin of some importance. When we got there we found nothing to photograph but a little bit of a dyke like a sheep-pen, or the boundary wall of an old churchyard. You can imagine how disgusted we were. Just beyond this is Loch Lubnaig. Should there be no boats on the water, this loch does not compose well. The stretch of water is too expansive, and the hills around too distant to make an effective picture. We made some pictures, bringing in a length of the foreshore, which relieved it considerably. Two miles beyond this loch is the village of Strathyre. Nestling in the hills, it stands well for making some good studies.

If the foregoing, embracing the Leny to Strathyre, can be overtaken in one day, it certainly would be a busy day.

A Scotch Washing.

Staying at Strathyre, and going to King's House in the morning, could be done, or the other way, going back to Callander and starting back in the morning for King's House. (There was no station at King's House when we were there last, but if you tell the guard he will stop the train and let you out there.) This is the nearest railway point to Rob Roy's grave at Balquhidder. The walk to the grave is about three miles, considerably barren of trees; but there are highland huts and whins, and ferny hills and dales, all more in keeping with the wildness of the spot, and with this material there is no lack of work to do.

On a previous visit to this spot we came upon a Scotch washing, with the tubs, and bundles of clothes, and fire, and pot, with all the other paraphernalia necessary to complete a hill-side washing outfit; and the position chosen for their work was very good, behind a little one-arched bridge, with the running stream beneath. On the bank an old woman, slightly bent with age, was tending to the pot and fire, whilst a strapping lassie of twenty was stramping away at the clothes in the tub, with petticoats kilted to the knees, kicking away right lustily. We asked liberty to photograph her, and she was laughingly willing; but the old woman, who was evidently her mother, would not consent at all. She thought it was unlucky or something of that kind; but, after a little argument, we got the young one's picture—and that of the old one too, unknown to her.

After exhausting Balquhidder, when in this locality Loch Voil should be visited. It is quite near to the graves of the McGregors.

Lochearnhead.

On the return journey, about three miles from King's House, north, we come to Lochearnhead. The head of the loch is about a mile and a half from the station. This is a favoured district for artistic bits, the very high roads being cut through the most romantic of scenery. But all along the Oban line it is almost impossible to err in choosing spots crowded with natural beauties. We have Killin and the junction to Lochs Tay and Kenmore, and further on Dalmalley and Lock Awe, possessing within themselves surroundings that are almost endless in their profusion of nature's pictures.

Loch Venachar.

Coming back to Callander, we start another little trip by crossing the bridge over the Teith and turning to the right at the end of the bridge street. This is the popular walk to Loch Venachar. It is a stretch of about three miles, and well wooded the most of the way. Here we are upon ground made famous by Sir Walter Scott in his *Lady of the Lake*. The river Teith passes close to the belting of wood all the way, and the old bridge that crosses it half way to the loch makes a good picture. Behind the pretty little cottage belonging to the Water Works, close to the loch, Coilantogle Ford, is situated "Clan Alpine's outmost guard." This is the spot where Roderic Dhu challenged FitzJames to single combat. When we got there, however, we were much disappointed at the want of any prominent feature to make a picture. The light was against us certainly; but, suppose that had been right, the ford did not seem more than a weir in a dam, without any interesting surroundings except what it has gained from the poem, and we could not transfer that to a plate. The loch itself at this end is very flat and barren—the upper end improves—none of it striking, but the wooded way from the village to the loch supplies plenty of good material and opportunity for picture-making.

Returning, the village may be reached by crossing the old bridge and making a circular tour to Callander by the Trossachs road. Coilantogle Farm, and some other interesting points, will be found on this road.

WHY PHOTOGRAPHS FADE.

V.

During development or toning we can see to what extent the porous condition of the vehicle containing the silver haloids controls the results, but unfortunately in the hypo and washing baths we have not the same advantage, and, to an extent, we shall have to depend upon circumstantial evidence in our inquiry.

In fixing a print, the chloride and organic salts of silver are first converted into hyposulphite of silver, which is dissolved, as it is formed, in the excess of hyposulphite of soda present. But test-tube and other experiments teach us that if this necessary excess of hyposulphite of soda is not present *at first*, that an insoluble state of hyposulphite of silver is formed, which, when once formed, cannot afterwards be dissolved in hyposulphite of soda. In a test-tube, with sufficient silver and hypo, one can obtain the yellow and black forms of this salt, but in a print it is in such a small quantity as to be invisible until the sulphur in the atmosphere combines with it, and we then get the true yellow sulphide.

I think that here we have a clue to the cause of the deterioration of nine-tenths of our silver prints—viz., that, through the physical density of the vehicle, or on account of slight differences in manipulation, that *at first* there is not sufficient excess of hyposulphite of soda able to get at the silver chloride unreduced by light to dissolve the hyposulphite of silver as fast as it is formed, and that insoluble hyposulphite of silver is left in the film in consequence.

I have shown above how the physical condition of the vehicle affects the development and toning of the photographic image, and I have proved by sulphuretted hydrogen tests that the action of the hypo bath is governed, to a great extent, by the same conditions, so that I think we can say that it is very doubtful whether the whole of the silver can be removed from the high lights of a print which cannot be toned by the ordinary acetate or borax baths as easily and as rapidly as an ordinary albumen print, and I do not think we can depend upon a print being properly fixed if it can only be toned in a strong sulphocyanide toning bath.

We now come to the cases of the fading of prints where the physical conditions of the vehicle are identical, and yet we find that some prints stand for years without any change, others deteriorate

very soon. This difference must be due to slight changes in the method of manipulation. I do not know whether others have noticed the same, but it has seemed to me that, as a rule, small prints stand better than large ones. If it is so, it is probably due to the small prints being moved about more freely in the hypo bath at first. We will suppose a 15 × 12 print toned and washed, and laid face upwards in a 16 × 13 dish, and then the hypo bath poured over it.

On the face of the print there is an insoluble deposit of silver reduced by light plus the deposit of gold upon it. The hypo has then to get through these deposits somehow to the non-reduced silver chloride, &c., behind them. The paper is already saturated with water, which further weakens the strength of the hypo which manages to get through. Can we wonder that, in this case, there is not sufficient excess of hyposulphite of soda able to get at the chloride of silver at the back of the imago to prevent the formation of insoluble hyposulphite of silver there. Or, we will say that the hypo has been poured into the bath first—a print is put down into it, then another on the top of that, then another, and so on. In this case we get only a small amount of hypo between each print, in some places they are probably sticking together. This small amount of hypo between the prints will combine with, and be weakened by, the water in the paper, and we get the same insoluble salt of silver formed before the prints can be turned over and fresh hypo can get at the silver unreduced by light which is at the back of the image, and this is just where any combination of silver and sulphur will cause the most damage and produce fading; it is greedy for more sulphur to form a pure sulphide, which it obtains from the sulphuretted hydrogen in the atmosphere, and then the metallic silver, which is with the organic matter forming the image, begins to think it would prefer to combine with sulphur rather than the substance to which it had been previously united, and when it does that the poor photograph suffers and fades, because there is not sufficient silver present to give the requisite opacity when in the form of sulphide of silver.

It is generally acknowledged that albumen prints prepared now fade more quickly than those did which were printed twenty or thirty years ago. Can we wonder at it when we think of the much greater difficulty that the hyposulphite of soda must have to get at the silver chloride, &c., bound up in the coagulated film of the double albumenised papers?

Then, when we use papers sized with partially insoluble substances, to get a better surface image, we find even greater difficulties, because the silver unreduced by the light at the back of the image is between the insoluble image on the surface of the film and the insoluble sizing of the paper; and how can we expect a print to be properly fixed, or the hypo washed out, under such conditions, and yet some manufacturers do not seem to give a thought about such matters.

And now a word of caution as to prints on opal glass. Here all the silver dissolved by the hypo has to be got away through the image on the front somehow. I do not know where to put my hand on the results of my experiments of some years back on this subject, but if I remember right, emulsion prints on opal glass, when tested with sulphuretted hydrogen, yellowed more readily than prints with the same emulsion on paper, because, in the latter case, the hypo and silver would get through the porous paper at the back, and yet we hear people say, "Prints must be permanent if they are on glass." I also found that if prints on opal glass were stood up on end to dry, that the hyposulphite of soda and silver that the washing water could not get out of the film must have drained down through the gelatine between the image and the glass, because the lower end readily yellowed by the formation of sulphide of silver.

All this seems very simple after it is once worked out, but things of this kind cause a rare lot of work before they can be run to earth, and we must now see what lessons we can learn to apply to our everyday work.

It is very evident that the great thing required is, that the whole strength of the hypo bath must be concentrated as rapidly as possible on the chloride and organic salts of silver at the back of the image, that have not been reduced by light, so as to have sufficient excess of hyposulphite of soda getting through the paper to dissolve the hyposulphite of silver as rapidly as it is formed.

The water in the paper ought to be squeezed out of the print, or the latter ought to be put between blotting-paper before being put in the hypo bath, so that the hypo soaking into the paper is not diluted by any water already there.

There should always be an ample amount of solution in the hypo bath for the number of prints to be fixed, which must not be allowed to lay close together, but there must be plenty of room for every part of each print, both front and back, to obtain the full action of the hypo during the time it is being fixed.

I feel convinced that, when a print stands well, it has been fixed under these favourable conditions; but, if it yellows and fades rapidly, that the deterioration is due to these necessary requirements not having been carried out in a satisfactory manner.

There are some points in connexion with toning and washing of the prints that have an important bearing on their permanence, but I must leave them for a further communication.

HERBERT S. STARNES.

ADVANCED PHOTOGRAPHIC WORK FOR AMATEURS.

I.

AMONG the great army of amateurs who now practise photography as a pleasurable pastime, doubtless there will be found a large number of ladies and gentlemen who, having mastered the elementary part of photography, aim at something higher than the mere exposing of plates, with the subsequent development of same, and finally printing their own negatives by any of the commonly known methods of printing, such as the ready sensitised papers procurable from photographic dealers. To such, no doubt, a very agreeable change will be found by giving some little thought and attention to opal work. By this I do not mean the use of the common form of gelatino-bromide opals, which are advertised in nearly all photographic periodicals, and which necessitate development after exposure by contact or through the camera, but the more easily manipulated and cleanly, good old form of printing-out opals, whereby most beautiful results may be obtained by merely placing a sensitised opal in contact with a suitable negative in a printing frame, in exactly the same manner as they would a piece of sensitised silver paper.

Such method of printing is by no means so well or largely adopted as it might be, doubtless on account of the inability of amateurs and others to get a supply of such opals ready sensitised from the various dealers, like they obtain other requirements. Still, to any one desirous of departing from the beaten track, and striking out into fresh pastures, there is really no trouble or any reason whereby such should not, with the greatest certainty of success, prepare their own emulsion, and coat and dry their own opals.

Kind reader, at the outset do not let me frighten you away from this delightful method of printing by the mere mention of any one making their own emulsion and coating their own plates. Do not conjure up visions of grovelling in dark rooms, with its attendant tedious boiling operations, and all the other bugbears in its train. Such is not required in the production of the emulsion I am dealing with; whilst to those who are inclined to undertake something they have never previously attempted in photography, I can safely say, once they experience the delight of making their own emulsion and preparing their own sensitised opals, they will never regret having taken such a departure, for very likely it will open their eyes to see and understand much that in the past was quite beyond their ken.

Let any one, therefore, so inclined, and who having beside them a stock of spoiled opals, proceed without delay to wash off the gelatino-bromide films. This is best done by making a saturated solution of washing soda, into which place the opals for, say, twenty-four hours; then take a flannel pad, and, having obtained from the kitchen-maid her Bath-brick, proceed to rub off the old emulsion. Powdered Bath-brick is the best thing I know of for cleaning soiled opals; it is far and away ahead of powdered pumice-stone. Having got a supply of clean opals, let them be stowed away until a small quantity of emulsion be made, an operation which takes less time to perform than it takes me to write particulars about. Within recent times the cost of opals has fallen very much in price, and those not having any soiled ones can at a very trifling cost procure a supply from any photographic dealer, and they can be had either with matt or glazed surfaces. The former, I would suggest, should be used by any one who for the first time undertakes this work; but of this I shall speak more fully when I come to refer to the coating of the plates. Now as to cost. Surely a modest sixpence is not an extravagant sum for any one to expend in amateur emulsion-making, yet for this small outlay sufficient emulsion can be made to coat two dozen half-plates.

Then, as to facilities of making emulsion and drying of the coated plates. The whole operation can be performed without any mess at an ordinary kitchen fire, or on a parlour table, provided the operator has the luxury of a good Fletcher gas-stove.

Begin working in ordinary gaslight by getting the cook to provide you with a clean jam pot, into which place two ounces of clean cold water. Then add to, and dissolve in the water, six grains acetate of soda, after which add forty grains hard gelatine. Place the jam pot in a saucepan of water, and warm the water in the saucepan up to 100° Fahr., not more; the gelatine in the jam pot will soon be melted. Now, having obtained from any chemist or elsewhere

thirty grains of nitrate of silver (it will cost threepence), place same in a glass measure, and dissolve the silver in one ounce of clean cold water, add this to the melted gelatine in the jam pot with vigorous stirring. Next, place in a clean glass measure, or other suitable vessel, two ounces clean cold water, into which place eight grains acetate of soda, and four grains chloride of ammonium, dissolve, and with vigorous stirring add the same to the melted gelatine in the jam pot. Keep the water in the saucepan gently warmed, not over 100° Fahr., at no stage should it exceed this. A stem thermometer will easily enable an operator to keep the water in the saucepan at the proper temperature. Next, take 160 grains hard gelatine, and soak the same till softened in clear cold water, then pour off all the unabsorbed water, and add the gelatine to the emulsion in the jam pot. Stir well with a glass rod till all the gelatine is melted, then cover over the jam pot with a clean cloth, tied over the top, and set aside in any dark cupboard, or old hat box for twenty-four hours—or say till next evening—when, on examination, the jam pot will be found to contain a jelly-like mass; the pot is now again placed in a saucepan of warm water, not over 100° Fahr., till melted, and having provided another clean jam pot, over the top of which a clean handkerchief has been stretched, damp the same with clean warm water, but do not run any water into the jam pot. When the jelly-like mass of emulsion is melted, add half ounce alcohol—or methylated spirit will do—and pour the emulsion through the handkerchief into the clean jam pot; this, if done properly, will filter the emulsion quite well enough for the class of work we are considering. Finally, add two ounces of clean cold water, and the emulsion is complete, and the same may be at this stage used for coating the plates, or it may be set aside in a dark box for use at any future time. When, say, it is desired to coat only an odd plate or so, it is best to take out with the fingers, or a horn spoon, just sufficient of the jelly-like mass of emulsion when it is cold, and only heat as much as is about necessary to coat the number of plates required. This can be easily done by placing the lump of emulsion broken off from the mass in a clean tumbler, and by placing the tumbler in a pan of warm water, melt it, and keep it at an even temperature, with water not above 100° Fahr., during the coating of plates. This method saves the too frequent melting of the entire pellicle of emulsion when only a small quantity of plates are needed.

T. N. Armstrong.

PHOTOGRAPHIC SURVEY OF WARWICKSHIRE.

The formal presentation, of the photographs which have been taken by members of the Birmingham Photographic Society in prosecution of the scheme for a photographic survey of Warwickshire, to the Mayor for safe custody on behalf of the citizens, was made on Saturday afternoon at the Art Gallery, where the survey pictures are now on exhibition. The presentation was made by Mr. J. B. Stone, as President of the Birmingham Photographic Society, and, in addition to the Mayor, there were present Alderman Johnson (Chairman of the Free Libraries Committee), and Messrs. J. Satchell Hopkins, S. H. Baker, H. S. Pearson, Joseph Hill, John Collier, Whitworth Wallis, A. B. Chamberlain, and several of the gentlemen who have contributed to the collection.

Mr. J. B. Stone said the undertaking in which they had engaged was one of enormous difficulty and magnitude, and, although already over 1000 excellent pictures had been sent in, they formed only the mere fringe of the whole scheme they had in view. They hoped that it would eventually embrace, not only the architectural and antiquarian aspects of the county, but also its botanical and geological aspects, and also copies of the portraits of Warwickshire worthies which were hanging on the walls of many ancient buildings of the county, or were otherwise obtainable. The Society desired that their contributions should not be regarded as in any way examples of photographic art, but purely as historical records. The work had been warmly taken up by the members of the Society, and they hoped in the future to have the assistance of many other Photographic Societies in the county, and that for several years to come they would be able to add annually to the collection which they were now inaugurating, and which they left confidently to the safe keeping of the Mayor and Free Libraries Committee.

The Mayor said if Science had provided the means, and the inhabitants of the city and county had had an opportunity of making records of what existed in past generations, it would now have been of the utmost value to Birmingham and the county at large, and, by deduction, they themselves knew how great the value would be to the future of what they had done and intended to do. It was a source peculiarly pleasant that this gift should have been made to the city through the hands of Mr. J. B. Stone, whose interest in photography, and desire to do that which he had now accomplished, they all knew.

The collection, which consists of some 500 photographs, represents about one half of the work done during 1891 in connexion with the survey, and some fifths of the exhibits have been contributed by members of the Local Society, some few having been sent in by the archæological section of the Midland Institute, and some others by outsiders. The photographic element of Coventry, Leamington, Rugby, and Wylde Green, together with the Arden Club, of Solihull, were asked to assist, but did nothing. The exhibits, which are all printed on platinotype paper, and from whole, half, and quarter plate negatives, have been prepared on a truly scientific and systematic basis. On the back of each is written a quantity of detail as to the object itself, and the conditions under which it was photographed, which will be of inestimable value to the archæologist, and would enable an architect to reconstruct the original if it disappeared. The work of surveying was last year done rather casually, but this will not be the case in 1892. The Council have mapped out sections of a square mile each on the ordnance map, and allotted them to one or more members, with advice to special individuals to adhere to special sorts of work. They supply a list of the most suitable objects to be taken, and issue special permits for the workers. Under all circumstances it is not surprising to learn that the survey may take some years to complete. Mr. Whitworth Wallis has prepared an excellent catalogue, for which Mr. Jethro Cossins and Mr. James Simkins have written historical and architectural notes.

In the evening the Council of the Survey, on the invitation of Mr. J. B. Stone, met the Mayor at dinner at the "Colonnade Hotel," in celebration of the presentation of the first instalment of the photographic records. Among the guests were Messrs. J. H. Stone, Jonathan Pratt, Alfred Hayes, J. Simkins, J. A. Bagnall, J. F. Mousley, F. G. Lyndon, W. J. Harrison, Whitworth Wallis, E. H. Jaques, W. Roche, W. Buncher, Joseph Hill, H. Baker, E. H. Leeson, J. H. Pickard, W. S. Horton, John Collier, E. W. Badger, A. R. Longmore, W. Jones, E. C. Middleton, &c.

Mr. Joseph Hill proposed "The Warwickshire Photographic Survey," and said there could be no more agreeable task than that on which those taking part in the Survey had entered. The Archæological Section of the Birmingham and Midland Institute had done most valuable work in the past in the series of photographs taken for them by Mr. Collier of subjects which it would now be impossible for them to obtain. But there was very much more to do than this Section could possibly undertake, and the Survey was exactly the thing wanted. They were deeply indebted to Mr. Jerome Harrison for having suggested it.

Mr. Jerome Harrison replied to the toast, and said, though the honour had been claimed for him of having broached the idea of the Survey, its practical accomplishment was almost entirely due to Mr. Stone, and the success which had been achieved in Warwickshire would render similar work in other parts of England much easier than would have otherwise been the case. Already a dozen or more Photographic Societies in other parts of the country had copied their example, and they hoped before long to see the whole of the 300 Photographic Societies in the country engaged in the work.

Mr. J. H. Pickard (Hon. Secretary to the Survey Council) and Mr. Simkins also briefly acknowledged the toast, and the former prophesied that the next annual collection would show a great advance on that now being exhibited. The latter said the present exhibition consisted really of desultory work, but very shortly the Organizing Committee of the Survey would issue their prospectus for the next year's work, and it was hoped that more systematic and concentrated effort would result.

Our Editorial Table.

The First Principles of Photography.

By Clement J. Leaper.

This work is an elementary treatise on the scientific principles upon which practical photography depends, and embodies in it the substance of the courses of lectures on photography annually delivered by Mr. Leaper since 1882 at the Dublin Mechanics' Institute and City of Dublin Technical Schools. It would be extremely difficult to discover any topic connected with photography which Mr. Leaper in these thirty-five lectures has neglected to touch, and to treat in a thorough and facile manner. It contains 260 pages with numerous illustrations. Published by Iliffe & Son, St. Bride-street. Price 5s..

Practical Enlarging.

By John A. Hodges, Vice-President of the West London Photographic Society.

In this manual, also published by Iliffe & Son (price 1s.), Mr. Hodges discourses in a practical manner on the various methods of making enlargements as practised at the present time. He also gives directions concerning the production of enlarged negatives. He expresses the opinion that an enlargement produced from a small negative must necessarily be superior to a print from a large negative taken direct, on account of the greater depth of definition given by a small lens of short focus. Eighty-seven pages.

The "Imperial" Plates.

The Imperial Dry Plate Company, Cricklewood.

Some samples of this new brand of plates (of the Extra Rapid kind) which we have recently tried yielded us exceedingly bright

and vigorous negatives. From a technical point of view the plates appear to be excellent. It is an additional point in their favour that they are amenable to the action of the chief ordinary developers in common use.

The Pocket Changing Bag and Focussing Cloth.

By W. R. Baker, Wallington, Surrey.

In this Pocket Changing Bag Mr. Baker has made several improvements upon the one intrdouced by him in July last year. The bag is formed of a soft pliant material, lined with a flexible red fabric, both of them of such close texture as to prevent admission of light. The window in front (shown in the cut) is so constructed that the

amount of light can be regulated. While small enough to go into one's pocket, it is so expansive when opened as to permit plates up to whole-plate size to be changed. A species of domino mask held close to the eyes by elastic bands prevents light from getting to the interior. The sleeves are also light-proof. It is a cheap seven-and-sixpennyworth.

The Strand Magazine for May.

If we except the rather namby-pamby photographs of "May Queens," the illustrations in the May number of the *Strand Magazine* are excellent. This is especially the case with those of Sir John Lubbock's article, "Beauty in Nature," and "Adventures of Sherlock Holmes." The "Portraits of Celebrities" in this number consist of Madame Mary Davies, Walter Besant, James Rice, Marcus Stone, R.A., Alphonse Daudet, Lionel Brough, and Henry W. Lucy ("Toby, M.P."). These, as usual, are well executed, and show the various subjects at intervals from youth up to the present period.

Received :—*A Short and Easy Road to Photography*. By Charles W. Brumwell. The "easy road" is indicated in half a dozen pages, the remainder of the pamphlet being devoted to a price list.—*My Camera and How to Use it*. By W. Scorer. This is also a brief pamphlet, treating of the subject in clear and easily understandable language.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 8316.—"Improved Plate-holder or Dark Slide for Photographic Purposes." T. Scott.—*Dated May* 3, 1892.

No. 8324.—"Improvements in Photographic Hand Cameras." J. S. B. Bell.—*Dated May* 3, 1892.

No. 8328.—"Improvements in and Connected with Photographic Sensitised Celluloid Films." E. H. Fitch.—*Dated May* 3, 1892.

No. 8432.—"Improvements in and Adjustments for Optical Lanterns, Fronts, Tubes, Jets, and Holders thereto." W. H. Oakley.—*Dated May* 3, 1892.

No. 8497.—"Improvements in Photographic Printing Frames." W. Middlemiss.—*Dated May* 5, 1892.

No. 8503.—"An Improvement relating to Photographers' Roll-holders." D. Roy.—*Dated May* 5, 1892.

No. 8618.—"Improvements in Photographic Cameras." R. de Barril and J. O. Fowler, jun.—*Dated May* 6, 1892.

No. 8646.—"Estcourt's Patent Changing Back for Films and Plates." E. Estcourt.—*Dated May* 6, 1892.

No. 8650.—"Improvements in and Relating to Film Packages for Photographic Cameras." B. J. Edwards.—*Dated May* 6, 1892.

No. 8667.—"Improvements in Photographic Cameras." A. H. Garman.—*Dated May* 7, 1892.

No. 8701.—"Improvements in the Production of Photographs and Photographic Transparencies in Natural Colours." V. Mathieu.—*Dated May* 7, 1892.

No. 8742.—"A New or Improved Shutter for Photographic Exposures." W. B. Parselle.—*Dated May* 9, 1892.

No. 8882.—"Improvements in Photographic Dark Slides for use with Celluloid and other Films." H. E. Colville.—*Dated May* 10, 1892.

No. 8967.—"Improvements in or relating to Photographic Plates or Films." Communicated by G. Eastman. A. J. Boult.—*Dated May* 11, 1892.

No. 8979.—"An Improved Photographic Negative Washer." G. F. Firth.—*Dated May* 12, 1892.

No. 9097.—"Improvements in Photographic Cameras." S. S. Gostick.—*Dated May* 13, 1892.

SPECIFICATION PUBLISHED.

1891.

No. 2725.—"Photographic Cameras."—Sanders.

PATENTS COMPLETED.

Method of and Apparatus for Reproducing Photographs.

No. 7785. Bernard Krantz and Hermann Zeissler, 13, Bunhill-row, City of London.—*April* 9, 1892.

This invention has for its object the reproduction of photographic pictures in ink at a small cost.

According to this invention we take from nature or from pictures or prints a negative either in the usual way, or with a "Raster" or grained plate interposed between the lens and the sensitive plate.

A transfer print is made from the negative by any of the well-known methods. We then take a piece of calico and spread on one side thereof a film of sensitive gelatine. We transfer the print to the gelatine (by exposure to light) and high etch the latter by means of glycerine and liquid ammonia, thus producing what we call the calico and gelatine block.

When finished the calico and gelatine block is mounted on a piece of wood or metal provided with a handle, to enable it to be used as a hand stamp, and then prints or impressions can be taken from it in the usual way.

Improved Method of Photo-etching on Zinc and Copper.

No. 8121. Bernard Krantz and Hermann Zeissler, 13, Bunhill-row, City of London.—*April* 9, 1892.

The object of this invention is to produce, by means of photo-etching on zinc and copper plates, suitable for producing in "half-tone," the highest class of printed work, such plates being prepared ready for printing from in less time and at a smaller cost than any plates of whatever description now used for printing from.

According to our invention, we take a tin plate of suitable size and shape, and cover the same with a coat of lampblack, and when this is dry, we coat over the lampblack with Chinese white, and thoroughly dry the plate. We then, by means of an ordinary ruling machine, rule on the prepared plate, through the white only, diagonal, horizontal, vertical, or crossed, straight, waved, or jagged lines. This operation leaves the plate showing black lines on a white ground. We then throw an enlarged image of the picture or design to be printed on the ruled plate by means of a magic lantern. We then take a negative of the dimensions of the finished print by means of a photographic camera in the usual way from the picture or design as thrown on the tin plate by a magic lantern, and print from such negative on the zinc or copper plate, which has been previously sensitised with bitumen, and develop the picture on the zinc or copper by the aid of turpentine in the usual way. If the plate used is of zinc, we next immerse it for about thirty-five minutes in a bath of three parts nitric acid and twenty parts water by measure. When removed from the bath, we sponge off all the acidulated water with a solution of gum arabic and water. The deep shadows will now be well visible. We next immerse the plate for about five minutes in a saturated solution of carbonate of soda, and then place it under running water for a short time, and lightly rub it with a soft rag or brush for the purpose of cleaning the picture from any deposit of nitrate of zinc. When the plate is sufficiently washed, we ink it with ordinary printer's ink, and dust it well with powdered resin; the loose powder is blown off, and the plate again immersed in the acid bath, and, after allowing it to remain therein for about an hour, we remove it therefrom, and wash it well with oil of turpentine. We next ink the plate with etching ink, composed of equal parts of paraffin wax, tallow, and printer's ink, and replace it in the etching bath for about thirty-five minutes.

To accelerate the etching process, we may add to the bath for the two last etchings, a little at a time, a small quantity of both sulphuric and hydrochloric acids, the quantity to be in proportion to the hardness of the plate. When sufficiently etched, the plate is mounted on wood, and is then ready for printing from. If the plate to be prepared for printing from consists of copper instead of zinc, we for the first two etchings substitute for the nitric acid an equal quantity of a saturated solution of perchloride of iron in the etching bath above described, the bath for the third etching being the same as hereinbefore described for zinc plates. Or, instead of photographing an enlarged picture on to the ruled plate, as hereinbefore described, we may take a photographic negative direct from the picture, drawing, or object to be reproduced, and another negative (wet plate) from the ruled plate. These negatives we place in a magic lantern, with the negative from the ruled plate in front, and throw the combined image from both negatives for a sufficient time direct on to the zinc or copper plate, which has previously been sensitised with bitumen. After the picture has been developed on the plate by turpentine, the plate then etched and prepared as hereinbefore described. This process is also sui

able for preparing zinc or copper matrices for making indiarubber stamps, and for engraving zinc or copper seals or dies in intaglio or relief; but when engraving in relief is required, a positive photograph must be used instead of a negative.

Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, we hereby declare that what we claim is:—1. In the process of photo-etching on zinc and copper, the taking of a photograph from a picture or design thrown by a magic lantern on to a ruled plate, as and for the purpose hereinbefore stated. 2. In the process of photo-etching on zinc and copper, the throwing by a magic lantern of the combined image from two negatives on a zinc or copper plate sensitised with bitumen, substantially as described. 3. The improved process of photo-etching on zinc and copper, substantially as herein described.

Improvements in Apparatus for Photographing Engineering Drawings and the like.

No. 9591. William Palmer, 1, Greenvale-terrace, Dumbarton, Dumbartonshire, North Britain.—*April* 9, 1892.

My said invention has for its object to obtain increased efficiency, convenience, and economy, in photographing engineering drawings and the like; and it is applicable for making white-ground, blue-ground, or other analogous prints.

In carrying out my invention I employ, for the printing operation, a frame having a glass plate, which is curved instead of being of the ordinary flat form, and I secure the tracing or original, and the photographic paper on the convex surface of the glass plate by means of straps, or a cloth which can be highly stretched or bound over them, the arrangement being such as to allow of the tracing and paper being made free from creases, and applied very closely to the glass. In general, the frame may be placed so that the light will act on the concave side, through the glass; in some cases, however, the photographic paper may be placed next to the glass, and the tracing upon the paper, the light acting through the tracing, and on the convex side, instead of the concave side.

For developing the print I form it into a roll, and attach it to a rod, or convenient holder, and immerse it in the chemical liquid contained in a tall vessel of glass, or other suitable material, of a circular or other simple form in horizontal section. The said vessel is proportioned to contain a quantity of the chemical liquid just about sufficient for the operation on the print without unnecessary excess. Where drawings of various sizes have to be photographed, vessels of suitable sizes may be provided. With these arrangements, a smaller quantity of chemical liquid is required for each operation than with ordinary apparatus for the same purpose, this being an important advantage, especially for white-ground prints, for which the chemical liquid should always be as fresh as possible.

Improvements in the Methods of Producing Two or More Coloured Prints.

No. 6634. Eugene Albert, Schwabing, near Munich, Germany.—*April* 16, 1892.

This invention relates to the methods of making two or more coloured prints from colour plates or stones, and of photographically producing autotypic colour blocks or stones, and has for its purpose to attain more perfect results than heretofore.

When making a double print from an autotypic block in black colour, either the double prints differ only by greater intensity of colour from the simple prints, that is to say, the lines or grains coincide in the second printing precisely with those first printed; or the lights of the double prints appear grey, and the deep shades, disturbed by the two consecutive printings, have undergone a parallel displacement relatively to each other; or in large quiet surfaces dark stripes are observable, which vary considerably in distance from each other. The latter irregularity is produced by a slight turning of the two printings relatively to each other. The lines, therefore, cross each other at interstices, which are the smaller the greater the said turning has been. At the crossing points the lines lie upon one another, at all other points beside one another. Two lines lying upon each other appear lighter than two lines lying beside each other. The more acute the angle under which the lines cross each other, the more extended is that part where the lines lie upon and cover each other, that is to say, the larger become the light interstices between the dark stripes. When said angle becomes infinitely acute, the interstice becomes infinitely large; no stripes are formed, and the prints coincide absolutely. This latter result is, however, in general, very seldom attained, owing to the influence of the temperature on the paper, and by other reasons. That a very slight displacement or turning suffices to produce the said irregularities, may be gathered from the fact that autotypic blocks generally have five to seven lines to the millimetre, and that consequently the interstice between the lines amounts to about one-tenth to one-fourteenth of a millimetre.

The above applies naturally also, and in a greater measure, to the consecutive printing with several blocks which correspond to different colours, especially if they have been produced by photography.

When printing consecutively with several blocks in different colours, the prints again either happen to fit exactly, or a displacement or turning takes place. If the prints fit precisely, certain rays are absorbed, and only those colour rays which are common to two coinciding colours appear as the result of mixture, *i.e.*, pigment mixture is produced. If, however, the prints are parallelly displaced, the rays proceeding from adjoining points are only united in the eye of the observer, *i.e.*, optical mixture takes place, which has results differing from those of pigment mixture. If the prints have been turned relatively to each other, we have pigment mixture at the covering or crossing points, and optic mixture at all other places, whereby stripes of different lightness, as well as such of different colours, are produced, which, with printing in different colours, frequently result in most peculiar patterns. This formation of patterns, which renders coloured printing from line-plate blocks impossible, is entirely obviated by the application of line-plate systems which are inclined under a certain angle relatively to each other.

As mentioned above, the more acute the angle formed by the crossing of the lines, the more extended is that part along which the lines cover one another. It is evident that this part becomes shorter in proportion to the increase of said angle. Said part, with a crossing angle of thirty degrees, is so much shortened that no more stripes are formed. As with autotype printing, a line-plate system consists of two relatively vertical lines, each system must be turned for sixty degrees for printing three colours upon each other by means of autotypic blocks. With two colours, the above crossing angle may vary between thirty and sixty degrees. Also the other drawback, viz., that the colours are mixed either optically or as pigment, is obviated by the improved method, the lines being compelled through the large angles to cross each other at small intervals, whereby optic and pigment mixture is always produced simultaneously.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
May 23	Dundee Amateur	Asso. Studio, Nethergate, Dundee
,, 23	Gloucestershire	
,, 23	North Middlesex	Jubilee Hall, Hornsey-road.
,, 24	Great Britain (Technical)	50, Great Russell-st., Bloomsbury.
,, 25	Bath	Roy. Lit. & Sc. Inst., Terrace-walks.
,, 25	Burnley	Bank Chambers, Hargreaves-street.
,, 25	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 26	Birmingham	Lecture Room, Midland Institute.
,, 26	Camera Club	Charing-cross-road, W.C.
,, 26	Hackney	Morley Hall, Triangle, Hackney.
,, 26	Halifax Photo. Club	Mechanics' Hall, Halifax.
,, 26	Hull	Royal Institution, Hull.
,, 26	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 26	Liverpool Amateur	Crescent Chambers, 3, Lord-street.
,, 26	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 26	Oldham	The Lyceum, Union-street, Oldham.
,, 27	Cardiff	
,, 27	Holborn	
,, 27	Maidstone	"The Palace," Maidstone.
,, 27	Richmond	Greyhound Hotel, Richmond.
,, 27	Swansea	Tenby Hotel, Swansea.
,, 27	West London	Chiswick School of Art, Chiswick.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

May 17,—Mr. W. E. Debenham in the chair.

Photogravure.

Mr. A. Dawson read a paper on *Photogravure*, chiefly dealing with the subject in its economic, practical, and artistic aspects. In his introductory remarks he said that it was quite impossible for one man to master all the details of modern photography. In the progress of any particular branch one could never learn or practise too many of the details. Modern workers were largely indebted to the efforts of the late Robert Hunt. The copper-plate process was of many years' standing, but the cost of the plate was fixed, and it was now only a question of the greater or less ease with which the plate could be printed. The lights of the old mezzotint were more beautiful than process plates, because there was more clean paper in a mezzotint, but the latter was more expensive to print. Photogravure cost a penny per impression for labour only, and this, added to the cost of a plate, say, 4*l.*, made it necessary for several thousand prints to be made before the cost of production yielded a profit. A number of subjects on one plate gave an economical method of printing, and separated prints could be made before a book was ready. If printed on thin paper, the latter had to be backed up with a thick paper. For mounting, labour was cheap. Collotype gave some idea of copper work, especially if printed on thick paper without any gloss. He was surprised that photogravure was not taken greater advantage of in work for presentation plates. Discussing the artistic aspect he thought the artist's ideas should always be consulted. In the ideal photogravure the touch as well as transparency should be preserved. He complained of the narrowness of the photographic scale as given by negatives, and regretted that he should have to make parts of his lights and shadows artificially. There was a physical resemblance between photogravure and many of the little plates found in modern illustrated books, the latter simply being photogravures in negative. Treating of other processes, he said hand work was generally apparent, and in photogravure this would not do. He had often been asked as to the possibility of printing from a coloured plate. Martin's method was probably the best. In this, parts of the plate were coloured, and then scraped away as required, the printing being done in careful register. Three or four printings were necessary, but the registration was difficult. He did not see his way to making a plate in "nature's colours," as the plate mark would have to be cut away. He concluded by enumerating ten photogravure processes, by Waterhouse, Klic, Niepce, and others. Waterhouse had obtained a grain by means of ground glass. He (Mr. Dawson) had added a little stearine to sand, and had also inked over the tissue with tallow and oil, and bronze powder. He had also resensitised the exposed bichromated film, developed the picture, greased it, and applied bronze powder and printed in the daylight. In the Goupil method, the film was like a sponge on the plate. He was sorry that this process, which was a secret one and due to the late W. B. Woodbury, should have been allowed to leave the country.

Mr. T. Bolas agreed with a remark of the Chairman's that the lecture was a most interesting one, and thought it justified a few more details from Mr. Dawson.

The Chairman said that Mr. F. E. Ives had that day, at the Royal Institution, indicated the kind of colours that must be used for inking plates, and had shown results. The colours were not the old primaries, nor those which were now recognised as primaries, red, green, and violet-blue, but their complementaries, yellow, a sort of lilac, and blue-green. Thus a negative

taken through a red glass would be printed with the colour complementary to the red. He was sorry to hear that Mr. Dawson had to make his lights artificially, and hoped for the time when photography would do its work throughout. Drawing attention to the examples of photogravure on the walls, he said the process had been practised more completely in Germany, though doubtless Goupil's work was better known, on account of the subjects reproduced. There was a large amount of hand work in them. There were often fine examples of photogravure in the German periodicals, having a depth in the shadows not often seen in matt prints. He suggested study of the German works on the subject.

Mr. E. CLIFTON suggested that it would be a good thing for the Society to start a representative historical collection of prints. They had often wished to possess such a collection. It should be produced by a process free from the charge of evanescence. It would add to the importance of that Society, and the collection should be a national record of photographic history and progress.

A vote of thanks having been passed to Mr. Dawson, the meeting closed.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 12,—Mr. A. L. Henderson in the chair.

AMATEUR AND PROFESSIONAL.

Mr. A. HADDON referred to recent demonstrations and papers on the wet collodion process given before the members, and suggested that amateurs should make wet collodion positives instead of gelatine negatives, and thus remove the slur which professionals cast upon them, of interfering with professional photography. Mr. A. Haddon further mentioned that the Committee of the Association had arranged for a series of lectures to be given before the members which would afterwards be produced in book form. Promises had been received from Mr. J. Traill Taylor (who would discourse on *The History of Photography*), Mr. W. E. Debenham (*On Lenses*), Mr. A. Cowan (*Cameras*), Mr. A. L. Henderson, and others.

Mr. A. MACKIE asked if Mr. Haddon was serious in suggesting that amateurs should go back to positives? When they made wet-collodion negatives, prints were wanted from them just as they were from gelatine negatives now.

Mr. W. E. DEBENHAM said wet collodion positives were capable of giving better delineation than prints obtained in the ordinary way, and did not afford the same facilities for spoiling by retouching. Professionals should hold themselves above the paltry consideration of amateurs taking the bread out of their mouths. If amateurs' work was better than professionals', why, then the professionals must suffer.

Mr. F. A. BRIDGE mentioned that the photographing of [engineering] work had largely gone from photographers, many firms now getting it done at nominal cost by their relatives or *employés*.

Mr. P. EVERETT asked if a professional photographer had any prescriptive right in such matters? It seemed to be looked upon as a grievance that he did not get so many orders as hitherto.

Mr. MACKIE said that probably so many people knew the prices of photographs now that they would not buy them. The ordinary professional photographer was a very narrow-minded man, who, with the chemist, always thought he must have a monopoly.

Mr. W. G. BLACKIE, of the Blackfriars Photographic Company, exhibited and described the Anschütz Instantaneous Camera, and also a number of pictures of animals, &c., taken with it. Mr. Blackie subsequently passed round a collection of celerotype prints from negatives by Mr. Hudson.

QUESTIONS.

The following question from the box was asked: "How can you ascertain when the fixation of a silver print is complete?"

The CHAIRMAN suggested using the hypo pretty strong and giving the print plenty of time.

Mr. MACKIE said that then the print would not necessarily be properly fixed, and Mr. HADDON described the chemical changes produced in fixation.

Mr. FOULKS-WINKS suggested a second fixing bath, and testing it for silver.

Mr. S. J. BECKETT said that the question had been put at a recent City Guilds' Institute examination.

Mr. T. BOLAS suggested that the examiner be written to, asking him to tell them, for the benefit of photography, how to ascertain when the fixation of a silver print is complete? Having put the question, the examiner (Mr. Lyonel Clark) would no doubt be able to answer it.

Mr. Bolas's suggestion was agreed to.

Another question was, "What is the best means of cutting opal glass?"

Mr. A. COWAN suggested an old diamond, and Mr. G. W. ATKENS a wheel cutter, which stands more pressure than the diamond.

Mr. J. E. SMITH wished to know whether, as it was recommended to let a mixed gold and acetate bath stand for twenty-four hours, the gold and soda, if mixed separately, could not be used at once. The answer given was, No.

A third question asked a rule for calculating the exposure of an enlargement to a given size with a lens of a given size.

Mr. DEBENHAM said: Take the number of times that the length of the original is contained in the length of the image, add 1 and square the sum. Thus, in copying to the same size, the length of the original is contained once in the original 1, add 1=2, squared =4. For twice the size of the original, the result would =9, and thus a picture copied double the original size would require two and a quarter times the exposure of a picture copied same size with the same lens and stop. Mr. Debenham also said the rule was applicable to reductions as well as to enlargements.

TELEO-PHOTOGRAPHY.

Mr. H. M. HASTINGS had used a negative eyepiece in conjunction with a rectilinear lens, as recently suggested by Mr. J. Traill Taylor, and had tried the combination on the eclipse of the moon at a quarter to twelve the previous night. With an exposure of fifteen seconds there was considerable movement of the image. Reduced to three seconds, however, the remaining exposures were correct. The rectilinear lens was fourteen inches in focus, the draw of the camera being nineteen inches. What was the focus of the combination? Unfortunately he had used a nonachromatic eyepiece. Mr. Hastings showed several pictures of the eclipse, as also views of a house at 400 yards distance with an ordinary and a tele-photo lens respectively, the camera in the latter case being drawn out to sixteen inches.

MR. F. E. IVES.

Mr. BOLAS adverted to the work of Mr. F. E. Ives, which he said he had studied carefully, and said that he considered it a real advance. It was surprising how one saw photographs in colours in their true relation in the examples shown by Mr. Ives.

It was decided to invite Mr. Ives to lecture before the Association on the subject, and Messrs. T. R. Dallmeyer and J. Traill Taylor to lecture on teleo-photography.

Hackney Photographic Society.—May 12, Annual General Meeting, the President (Dr. Roland Smith) in the chair.—A satisfactory report was read by the Hon. Secretary, and the Treasurer reported 15*l.* in hand to carry over to the next season. The following officers were then elected:—*President:* Mr. Herbert Robertson.—*Council:* Messrs. W. L. Barker, R. Beckett, F. W. Gosling, F. Houghton, W. P. Dando, and Dr. Roland Smith.—*Curator:* Mr. Arthur Dean.—*Treasurer:* J. O. Grant.—*Hon. Secretary:* Mr. W. Fenton Jones, F.S.Sc., 12, King Edward-road, N.E. The night of meeting was changed to Tuesday, and also will, after June, be every week. The entrance fees remain as before. It was also agreed that the Club quarters be changed to a place of more social character, and premises have been secured where all the advantages of club life can be had. The Society has ninety active members, and promises well for the future. During the past season papers, &c., have been given by, amongst others, Messrs. T. C. Hepworth, A. L. Henderson, Henry Sturmey, Mackie, Foulks-Winks, Sinclair, &c. A most successful exhibition was held last October, when Captain Abney presented the prizes to the successful exhibitors.

Kensington and Bayswater Photographic Society.—May 9, Mr. Frogbrook in the chair.—Five questions from the question-box were read and discussed. Two of these seemed to give some difficulty in answering. They were as follows:—1. I have found fifteen seconds at one foot from a certain light to be the correct exposure for making a lantern slide by contact from a certain negative. What will be the correct exposure for making a lantern slide by reduction, using the same negative and light, the stop used being *f*-16, the negative being placed three feet from the lantern plate? 2. The above gaslight exposure being known for contact work, can the correct exposure for daylight be ascertained in any way from it? Mr. JONES gave a demonstration on *Photo-micrography*, showing some excellent microscopic slides and the lantern transparencies produced from them. He also showed with his instruments the best way of fixing the microscope and camera together.

Richmond Camera Club.—Friday, the 6th, was an extra Lantern Night. Slides were shown by Messrs. Kelsey (chiefly boat-race shots), Davis, and Ardaseer, and a fine selection of professionals' slides, lent by Messrs. Dick, Hunter, and Alabaster.

South London Photographic Society.—May 2, Mr. A. G. Banks (Vice-President) in the chair.—The Autotype Company's representatives (Messrs. Brown and Burton) attended to demonstrate the working of the carbon process. After giving a short history of the process, they explained the means by which the issues and temporary supports were prepared, and the method of printing. They proceeded to develop a large number of prints, both on single and double transfer tissue, in various colours. The means by which prints were completed were then dealt with. A large number of finished prints and transparencies were exhibited in the room. There was a large attendance of members (fifty), many of whom showed themselves to be very much interested in the working of the process, and seemed surprised at the simplicity and ease by which good results could be obtained by it. It was announced that Mr. Kirby had contributed a number of scarce photographic works to the Society's library.

Croydon Camera Club.—May 9.—Mr. E. J. WALL delivered his lecture on *Development*. The discourse proved to be mainly directed to a repetition of the assertion that the printing character of the negative cannot be influenced by the system of applying the developer. In order to prove his thesis, Mr. Wall exhibited a number of negatives which had been exposed on graduated squares, the series of squares being numbered from one to twenty-four, No. 1 being the extreme white, and No. 24 the extreme dark. A large number of plates were exposed in succession before this series for sixty seconds each, the illuminant (a paraffin light) being kept as constant as possible, and the distance being in each case the same. In every instance the development was carried to "fogging point." It is here impossible to tabulate all the many experiments which the lecturer described in modifying the proportions of the various ingredients in developers operated with; but his illustrations were mostly in some such form as follows:—First series. Plate (1) developed with, per ounce, 2½ grains pyro, 2½ grains bromide, 2 minims ammonia. (2) Same, but double the bromide. (3.) Without bromide. The resulting negatives were certainly more in accord with the popular notion than with the theories of Messrs. Hurter & Driffield. Series 2 illustrated the effect of altering the proportions of pyro. Series 3, of altering the proportions of ammonia. Eikonogen and hydroquinone were also similarly treated. At the end of an unusually interesting and suggestive paper a lively discussion ensued on development in general. Mr. D. E. GODDARD advocated the oxalate developer for all work except where considerable under-exposure is suspected; even then, by using a small proportion of hyposulphite with the developer, detail may be brought out. Mr. C. F. OAKLEY favoured rodinal being given a trial, he having obtained good results by using a strong solution (one to fifteen) for snap-shot work. Mr. J. PACKHAM mentioned that a variation in Beach's developer, by adding a small portion of ammonia in place of part of the other alkalies used in the solution, was very promising. In the discussion it was the general opinion that Mr. Wall had proved his case. On May 14 Mr. S. E. Burrows conducts a party of members to Mitcham; train leaves West Croydon at half-

past two. On May 21 the President (Mr. Maclean) conducts members to Nutfield; train from East Croydon at forty-seven minutes past two. May 23, Lantern Night; members' slides.

Birkenhead Photographic Association.—The meeting opened by passing a vote of condolence to the family of the late member, Mr. John Hartnup, the astronomer, who was killed by a fall off his observatory at Bidston last month. Mr. John N. Welch gave a demonstration of the new Ilford printing-out paper, and passed round an album showing the results he obtained with it. Mr. Lange and other members passed some of their slides through the lantern.

Bolton Photographic Society.—May 3, Mr. William Banks in the chair.—Messrs. J. T. Cooper and W. Abbott were elected members of the Society. Mr. C. K. DALTON read a paper on the *History of the Stereoscope*, and many stereoscopic transparencies and slides were exhibited by Messrs. A. Knowles, J. Young, A. Harper, J. E. Austwick, and others, a number of the slides being from negatives taken at the Society's recent visit to Miller's Dale. Messrs. R. and J. Beck exhibited a mirror stereoscope, and Messrs. Husbands, Bristol, one of Harding Warner's panorama stereoscopes, and Mr. Young a complete set of apparatus for producing stereoscopic transparencies.

Derby Photographic Society.—May 7, First Outdoor Meeting.—Fifteen members were present, leaving Derby by the thirty-eight minutes past one train in two compartments kindly reserved by the Midland Railway Company. They soon arrived at Kegworth, rather astonishing the good people at this place by the large array of cameras, tripods, &c. A pleasant walk of a mile and a half brought them to the very quaint village of Lockington. Cameras were soon unpacked, and a number of pretty views taken. They next wended their way to Hemington, which appeared to be more particularly noted for its ruined church, founded A.D. 1450; journeying forward to Castle Donington, where several more views were taken. A group of the members present was taken by Mr. Lowe. Altogether forty-two plates were exposed. Derby was reached at eight p.m. Mr. A. B. Bennett officiated as leader.

Southport Social Photographic Club.—The usual monthly social was held at Mr. Cross's studio, 15, Cambridge-arcade, on Wednesday evening, when the competition for the best set of six cloud and marine views was decided. The prize, which is presented by Mr. Cross, was won by Mr. Dickin, who sent in a much-admired set. The prize for next June will be for the best six views of the exterior of churches and chapels in Southport and the neighbourhood, when it is hoped a large number will compete. At the Committee meeting, held previously to the above, a letter was read from Mr. Cartmel, announcing his resignation, owing to his leaving the town and neighbourhood, as Secretary and Treasurer, an office which he has most ably filled since the formation of the Club, and which was received with very great regret; and at the request of the Committee Mr. J. R. Cave, of Nevill-street, consented to undertake the duties.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

PHOTOGRAPHY IN THE COLOURS OF NATURE.

To the EDITOR.

SIR,—Dr. Vogel's letter, on p. 318, merely contains a repetition of certain statements which he made some months ago in *Anthony's Photographic Bulletin*, to which I replied fully at the time.

Eminent scientists, Professor Sylvanus P. Thompson among others, do not admit that one colour may have several complementary colours, and my position is fully sustained on that point.

My claims to originality in orthochromatic photography were fully sustained by the Franklin Institute of Philadelphia, after giving Dr. Vogel a full hearing, and submitting my statements to him to disprove if he could, and were recognised by the award of the John Scott Legacy medal by the city of Philadelphia.

My method of colour photography is positively inconsistent with Dr. Vogel's alleged principle.

Dr. Vogel never recognised the Young-Helmholtz theory of colour vision in connexion with the subject of colour reproduction by photography until after I published my principle representing the application of that theory, and he never gave instructions for operating any process consistently with the facts which support that theory.

According to Mr. Bothamley's translation, Dr. Vogel gave *five* as the minimum number of negatives and prints that could be made to carry out his alleged principle as published in 1885. Nothing was heard about his trying to do it with three until after I proved, by theoretical considerations that three only are required in accordance with true colour theory.

Does Dr. Vogel realise that I have actually reproduced nature with what is practically a single photograph, and a device no larger than a hand stereoscope?—I am, yours, &c.,

FREDERICK E. IVES.

7, *Devonshire road, South Lambeth, May* 13, 1892.

DEPTH OF FOCUS.

To the EDITOR.

SIR,—The letter of Mr. F. H. Wenham, in your last issue, is calculated to revive the notion amongst photographers that "depth of focus" is a quality possessed by some lenses notably more than by others of the same aperture and focal length and of equal defining power in other respects. Will Mr. Wenham be good enough to show by diagram and explanation how, in such a case, the obtaining of depth of focus is possible; illustrating his argument not by reference to a pinhole stop, but by examples of two lenses of the same ordinary practical aperture and length of focus?

The rules for finding any specified amount of so called depth of focus are based in the text-books on the aperture and length of focus merely, and if any other factor steps in, these rules must be modified.

To clear the way, it may be as well to specify two or three cases suggesting exceptions which are rather apparent than real.

1. A lens having great spherical aberration may be moved to a greater distance from the focus than may a corrected lens, and still give some sort of image of a brilliant point, such as a star against a black ground, intense contrast allowing the few rays focussed at the out-of-general-focus plane to assert themselves. With such ordinary objects, however, as the photographer has to deal, these attenuated and feeble rays are eclipsed by the light from the neighbouring points, so that no real increase of depth of focus results.

2. With lenses having the most perfect spherical and chromatic corrections, the definition will be finer at the focus than with imperfectly corrected lenses, and consequently at planes so near the focus as not to be manifestly wanting. This quality should rather be recognised as finer absolute definition than as depth of focus. It comes to this, that, starting from a finer point, it is farther before a certain degree of bluntness comes in.

It may be noted that the two cases cited are opposite in character, but I have known each put in support of a claim for depth of focus, and in each case professed to be supported by photographs to illustrate the claim. When, however, the photographs were examined, it was found that the photograph taken by the standard lens, with which the others had been compared, were not focussed on the same point as those taken by the other instruments, and consequently were quite inconclusive. What definition was gained in background was lost in foreground, or *vice versâ*.

3. When the stop is moved a considerable distance from the surface of the lens, the depth of focus may be affected, but rapidity is also changed, and the depth should then be calculated according to the rapidity or effective aperture.

I await Mr. Wenham's demonstration of the position he takes up. Up to the present I look upon a claim for depth of focus as merely an advertising one, and hold with Petzval (whom I quote from memory) that depth of focus, as claimed for photographic lenses, is an expression only calculated to darken the intellect of the worker.—I am, yours, &c.,

May 16, 1892. W. E. DEBENHAM.

THE CONVENTION.

To the EDITOR.

SIR,—Pending the issue of our programme, which will be ready by the beginning of June, I ask you now to publish for the guidance of your readers who are members of the Convention the following particulars of the excursions, dinner, group, &c.:—

On Tuesday, July 12, there will be an excursion to Melrose and Dryburgh.

On Thursday, to St. Andrews and Dunfermline.

On Friday, to Dalmeny and Cramond Bridge, and to Roslyn and Hawthornden.

The group will be taken on the Wednesday, at noon, probably in Prince's-street Gardens.

The dinner and smoking concert will be held on the Friday evening in the "Waterloo Hotel."

The headquarters of the Convention at Edinburgh during the week of the meeting will be at the "Royal Hotel" and at the "Waverley Temperance Hotel."—I am, yours, &c.,

F. P. CEMBRANO, JUN., *Hon. Secretary.*

10, *Cambridge-gardens, Richmond, Surrey, May* 14, 1892.

MR. PARK'S PAPER.

To the EDITOR.

SIR,—In answer to your contributor "Cosmos," with regard to one or two statements in my paper on *Bromide Enlarging*, I hardly think they are incomplete. He says, in reference to my paper, "He usually takes his negatives for enlarging with stop *f*-32, but he omits to tell us the focal length of his lens." I do not think that the focal length of the lens has any material value, as I have always understood that *f*-32 is practically the same for all lenses, the object of using *f*-32 stop being, in this case, to obtain good definition in all planes, as well as at the edges. At the same time I may say that the focus of my lens is six inches on a quarter-plate.

Again, with reference to the density being greater in the centre when a large stop is used, he says, "He is, I think, making a statement which is possibly open to serious objection if it is to have a general application."

I think I could not do better than quote from an article, by Henry W. Bennett, which appeared in your JOURNAL a short time ago. In your issue of March 4, 1892, he says, in speaking of the rapid rectilinear lens, "A third objection is inequality of the amount of light reaching different parts of the plate when the larger stops are used, the beams of light forming the margins of the picture being much smaller in area than those in the centre. Diagram 8 shows this. A central ray, the full diameter of the stop, can pass through the lens intact, but the width of the marginal ray is determined by the extent to which it is cut by the lens mount, or the portion that the lens itself is capable of transmitting. The full diameter of the stop is shown by the dotted lines. In negatives exposed under those circumstances, where full advantage has to be taken of the rapidity of the lens, this inequality of illumination is a serious objection, as the centre of the plate frequently develops denser than the edges, and this detracts strongly from the value of the gain in rapidity."

In conclusion, as lenses are usually supplied with stops or "diaphragms" varying from *f*-5·6 to *f*-32 or *f*-64, I think there is no difficulty in describing those from *f*-5·6 to *f*-10 as large stops, and those from *f*-24 upwards as small ones.—I am, yours, &c., FREDERICK PARK.

52, *Collingwood-street, Newcastle-on-Tyne, May* 16, 1892.

FUSED SILVER NITRATE.

To the EDITOR.

SIR,—With regard to the greater sensitiveness of emulsions made with fused silver nitrate over those made with the ordinary kind, is it not possible that the fused nitrate, containing less water than the ordinary crystallised, if used in the same proportions, would practically make an emulsion with a larger excess of silver, and thus account for the extra rapidity?—I am, yours, &c., E. DUNMORE.

27, *Glenthorne-road, W., May* 17, 1892.

AMATEURS AND PROFESSIONALS.

To the EDITOR.

SIR,—I note in your latest issue an observation from "Cosmos" relating to the Bath Floral and Art Exhibition. I believe I am right in saying that amateurs are only restricted by not being allowed to affix a price to their exhibits: they are quite at liberty to sell, and no doubt will if a buyer presents himself. I do not think there is any unfairness about this. Does "Cosmos" expect amateurs to be placed on the same level as professionals? It is only proper that there should be a distinction between the two.—I am, yours, &c., W. COOPER EDMONDS.

Bath, May 15, 1892.

RECRYSTALLISED SILVER NITRATE.

To the EDITOR.

SIR,—It is not because "Cosmos" assisted his employers in cheating the public that other and respectable dealers and makers of photographic chemicals are to be considered as having always defrauded buyers by selling commercial silver nitrate at the much higher price of the recrystallised salt. I think it must be well known to you that a bath made with recrystallised silver nitrate would keep in good working condition much better than one made with commercial silver nitrate. I have some very strong evidence to this effect.—I am, yours, &c., SILVER BATH.

May 17, 1892.

A QUESTION OF "STYLE."

To the EDITOR.

SIR,—Your high-born, critical correspondent, Mr. Brown—from that serene atmosphere of literary supremacy in which he permanently resides—condescends to point out the shortcomings of some of those unworthy scribes who supply pabulum to the photographic papers. Some of those ignoramuses have actually spoken of Sirius as if Sirius were only a beam of light, instead of being a substantial astronomic actuality. Others of them have wandered wildly among sugar-bags and soap! There can be no doubt that these note-takers and note-makers should be more discreet in their lucubrations. For a fair share of this high-toned animadversion, "a Mr. Mathews" comes in. Mr. Mathews has had the audacity to employ the word "transference" when he should have said "transposition," and "unison" when he should have said "correspondence." And because he has done this his style is "pedantic and grandiose." That the uninitiated reader might the better understand, Mr. Brown proceeds to explain that certain portraits had been "out in two." In this tell-tale expression, he has himself incontinently dropped down among the feeble ones. With sufficient clearness he reveals that Mr. Brown is of that class of caterers for a sympathetic but ungrammatical public to whom we are on occasion indebted for the news, that yesterday John Smith "fell *in* the river" and was drowned. Our "penny-a-liners" do not really mean to say that John was already in the river when he fell, but only that, when he fell, it was *into* the river he fell. Furthermore, our modern Admirable Crichton dilates lucidly on "style." Now, of styles of writing there are, undoubtedly, many. There is the style of writing of Macaulay, and there is the style of writing of Carlyle. But, I pray you, in whose style of writing does the learned Mr. Brown pick up the phrase, which he launches with so much force at Mr. Mathews, that "this style of *writer* probably thinks more of sound than sense?"

Touching the topic dealt with in the phrases quoted, nothing need here be said; that is a matter which will stand or fall upon its own merits, despite the feeble flings of Mr. Brown. But, assuredly, one thing in this case is clear, our arquebusier has been hoist with his own petard. Hence Mr. Brown may at least learn this well-worn lesson, that those who reside in houses constructed with vitreous material should themselves refrain from projecting missiles.—I am, yours, &c., WM. MATHEWS.

Clifton, Bristol, May 7, 1892.

BOILS THROUGH USING OXALATE SOLUTION.

To the EDITOR.

SIR,—I would like to know the cause and cure of boils arising from the using of oxalate solution in developing bromide paper. I have been making enlargements on bromide paper all the winter, and have been troubled with small boils, till at last one has broken out on me as large as a halfpenny, which I have not been able to heal. I did not think up to now that it was the developer, but I feel sure it must be, for I have not been troubled with anything of the kind before. I have read, I think, in the JOURNAL, some time ago, of others that have been afflicted with the same complaint, and I have no doubt that both amateurs and professionals alike are troubled with the same complaint. Any information as to cure and prevention of this complaint will be thankfully received.—I am, yours, &c., S. SIDEY.

35, *Richmond-road, Dalston, E., May* 6, 1892.

FADING OF PHOTOGRAPHS AFTER DEATH.

To the EDITOR.

SIR,—In a railway train the other day a fellow-passenger said to me, quite seriously, "It is curious that when people die their photographs begin to fade." Now, as I never before heard of such a thing, I wonder if it is a kind of popular belief, for, however absurd it seems at first sight, it would be easy to bring forward any amount of proof of its correctness. Any one might, on the death of a friend, look up his photograph and find that since it was last seen a most perceptible fading had taken place, and half-naturally ascribe it to some sort of sympathy with the death of the individual, rather than to chemical changes.—I am, yours, &c.,

May 11, 1892. GEO. H. SLIGHT.

SPEED OF PLATES.

To the EDITOR.

SIR,—Messrs. Hurter & Driffield, by their careful and laborious investigations, have undoubtedly done great service to the science of photography; but, as efforts are being made to induce plate-makers to adopt their method as a standard means of marking the sensitiveness of plates, I feel bound to point out that there are serious objections to this course. My main objection is that Messrs. Hurter & Driffield's method only expresses the relative sensitiveness of plates to white light, and plate-makers, by dearly bought experience (for I put down the comparative failure of the Warnerke sensitometer to the same cause), have already found that such a scale, however accurate it may be, is very often at fault in expressing the *camera sensitiveness* of plates.

This is explained by the fact that, in most groups of objects which are photographed, the object which has to be exposed for, and which governs the length of exposure, is a *coloured* one, as, for instance, in a landscape, the grey green of foliage; or, in buildings, the grey orange of red brick. If the ratio of sensitiveness between white light and (for the sake of illustration) grey orange were the same in every plate, the proposed standard would be a suitable one; but plates vary greatly in their relative sensitiveness to different parts of the spectrum, and the adoption of a scale of white light sensitiveness would lead to errors of, in many cases, 100 per cent., if used as a guide to camera exposures.

I fully acknowledge the great need of a standard scale of sensitiveness, but it still remains to be devised. I also acknowledge that a good scale of white light sensitiveness would be some improvement on the present want of method.

If a scale of white light sensitiveness is considered "near enough," I feel sure that the use of Spurge's sensitometer, by means of light reflected by a white screen from a standard light at a standard distance, possesses practical advantages over Messrs. Hurter & Driffield's complex method. The apertures illuminating the various chambers might be numbered according to the U. S. values of the Photographic Society, and

f a low opacity were fixed upon as a standard, and the plate developed in ferrous oxalate for twenty minutes, errors due to development would be reduced to a minimum.

It will be observed that no *measurement* of opacity would be required, only *comparison* (in a suitable instrument), with a glass of the standard opacity, a fog slip of unexposed plate, developed with the other, being placed over the standard to make the requisite allowance for fog and opacity of the gelatine film. As a minor objection to Messrs. Hurter & Driffield's method, it should be noted that the standard sperm candle they use is by no means accepted by other experts as being reliable. Mr. Spurge objects to it (see last Camera Club Conference), as being subject to variation.—I am, yours, &c., ALFRED WATKINS.

Hereford, May 8, 1892.

THE PRICE OF PLATES.

To the EDITOR.

SIR,—You might allow me a small space for a few words on the above I, as a professional—or putting in my time as same—fail to see how the price of large-sized plates should be dearer in proportion to smaller-sized plates. Take, for instance, a 10×8. They cost 7*s.* 3*d.* per dozen. Now, you cannot get six quarters out of that size, and if the makers are able to sell one single dozen at 1*s.* per dozen, surely they are able to sell less than six dozen at 6*s.* per dozen, although there are nearly six plates in one. Again, to my knowledge, there is more time lost in cutting up quarters than there is in 10×8's. There are six boxes and six packings required for quarters; for 10×8 there is one box and one packing required! Now, how many amateurs use 10×8? Very few in proportion to those that use halves and quarters. Then I consider that the professional who works large plates pays more for his than the amateur, because the most of them are wrought by professionals. But, as I am only a young cock just beginning to crow, perhaps some of the old veterans will be able to give me an explanation how it is that the large plates come to be dearer in proportion to the smaller ones.—I am, yours, &c., W. T. TAYLOR.

Kirkcaldy, May 9, 1892.

[The explanation of the fact that large-size plates cost much more in proportion to smaller ones is, probably, that the price of the glass per foot advances with the large sizes. Cost of labour and risks of failure are also very likely increased.—ED.]

STAINS ON PRINTING-OUT PAPER.

To the EDITOR.

SIR,—I bought some of the above paper a short time ago, and was very pleased with it. The second lot I had was not good, as blood-red marks came in sight while I was printing, which did not go in the toning. I wrote to the makers and told them of the red marks and the poor tone; they supposed I had had hypo or other chemical on the paper, and advised the use of more gold. I bought two more sheets, cut it up, and printed at once. It came out just as bad, although I used twice the usual quantity of gold, viz., two grs. gold, to eighty grs. borax. I sent the makers some of the paper I had used, and also some new pieces which I signed, asking them to try them, and at the same time to send me two sheets direct. The two sheets have arrived, but nothing has been said about the paper I sent. Can any of your readers tell me the cause of red marks? Is it bad paper, or is it my fault? If my fault, what have I done to cause the stain?—I am, yours, &c., ALFRED MEION.

Ash Hall, Stoke-upon-Trent, May 16, 1892.

CORRECT EXPOSURES.

To the EDITOR.

SIR,—The estimation of the correct exposure necessary to be given in photographing any object is admitted on all hands to be of great importance in order to obtain a good photograph of that object. If, then, the following remarks should bring into prominence one of the essential points to be taken into account for that purpose, it will form an excuse for asking you to find a place for them in your paper.

In estimating the duration of exposure, one of the factors to be taken into account is the amount of subject included on the plate. It is difficult to express the principle more lucidly; but perhaps an example will explain what is meant, and, at the same time, establish the truth of the statement.

Suppose, then, that a portion of a uniform subject is being photographed, and requires an exposure of four seconds to obtain the best results. If, now, all the other conditions remaining the same, we substitute for the lens first used one working at the same intensity (*i.e.*, the same ratio of aperture to focus), and such that it enables the plate to represent four times as much of the subject, four times as much light will be transmitted from the subject to the plate, and therefore the exposure required to obtain a similar result to that previously obtained need only be one-fourth as long, viz., one second.

Of course, in actual practice, a case so simple in its conditions as that just given can only very rarely occur; but, nevertheless, the principle holds good, and ought to be taken into account in estimating the exposure necessary under ordinary conditions. A less abstract example will show the importance of this to the practical photographer. Often two views of an interior are required, the one to take in as much of the subject as possible, the other being of some special part of interest, and it is found that both can be best photographed with the camera in one and the same spot; if the lighting be fairly equally distributed and the different lenses worked at the same intensity, the view embracing the wider angle will require the less exposure.

It is strange that this factor should be so imperfectly allowed for in most of the exposure tables, and should be completely ignored in the instructions issued with some of the instruments sold for the purpose of determining the time of exposure. No doubt practical photographers have unconsciously learnt by experience to take this into account, and the absence of directions in the exposure tables and instruments indicating the difference to be made in cases which experience tells them require different exposures may account for the suspicion, and often contempt, with which they regard these tables and instruments.—I am, yours, &c.,

May 15, 1892. M. J. MICHAEL.

Exchange Column.

*** No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Will exchange Marion's 12×10 rapid rectilinear lens for good safety bicycle.—Address, T. S. SIMSON, Leven's-park, Milnthorpe.

No. 9 Ross' portable symmetrical (29,001), want Optimus euryscope, 9×7, with shutter.—Address, W. HUTCHINGS, Hairdresser, Ealing Dean, W.

Will exchange seascape, interior and exterior, flatted oil on rollers, for other backgrounds.—Address, J. JACKSON, 7, Trafalgar-street, Coventry.

Will exchange 12×9 mahogany box printing frame with plate glass for two ordinary 8½×6½ printing frames.—Address, R. SMALLEY, 12, Park-road, Blackburn.

Half-plate lens by Ross, and square camera by Spencer, 7½×7½, in exchange for a diamond frame safety bicycle, ball bearings.—Address, JAMES DENTON, 70, Sheffield-road, Barnsley.

Will exchange profile pedestal and balustrade, and iron head and body-rest, for studio accessories or exterior background, 8×7, lighted from right.—Address, GEORGE MOORE, Buckfastleigh, Devon.

Background frame (new), takes five grounds on rollers, also two backgrounds (flatted oil), in exchange for studio furniture or accessories.—Address, G. S. COUSINS, Photographer, Westgate-on-Sea.

Will exchange C.-de-V. portrait lens, by Colfier, Paris, for wide-angle landscape lens by good maker or wide-angle rectilinear.—Address, HUGH MCMASTER, Blantrey, Port William, Wigtownshire, N.B.

Six volumes of THE BRITISH JOURNAL OF PHOTOGRAPHY and *Photographic News*, 1871 and upwards, exchange for folding tripod, instantaneous shutter, or offers.—Address, H. COUCH, 11, Waterloo-crescent, Dover.

Will exchange 10×8 rapid rectilinear, in good condition, for quarter-plate camera, tripod, three double backs, and fitted with Optimus 5×4 euryscope lens.—Address, SMITH & Co., High-street, Seadon, near Leeds, Yorkshire.

Wanted, studio furniture and accessories, in exchange for background frame (new) takes five grounds on rollers; also a plain background, dark one side, light the other; also a scenic background.—Address, G. S. COUSINS, Photographer, Westgate-on-Sea.

Exchange half brass-bound camera, three double slides, Ross's R. S. and P. S. lenses, Watson's shutter in velvet-lined leather case, complete, for light 12×10 camera (must be modern), developing tent, backgrounds, or eight-inch hot rolling machine.—Address, J. ASTON BARNES, Whitby.

Will exchange landscape background 8½×7½ for cloud or graduate same size, also Optimus cabinet burnisher for cabinet rolling press, with two rollers; also quarter-plate portrait lens for Lancaster half-plate Combination Rectograph with Iris diaphragms.—Address, T. H. PITCHFORTH, Photographer, Saltburn.

A CORRESPONDENT writes: "It may be possibly of some interest to your readers, amateurs and others, to know that if they travel over Righi they will find a commodious dark room at Righi-Schaldegg, offered at very liberal conditions to any one who may use it."

THE pictures lately on view at the Exhibition of English Photographic Art in Brussels will be shown by the Lincoln Camera Club, in the galleries of the Lincoln School of Science and Art, from June 8 next. The following have promised their Brussels exhibits for Lincoln:—Messrs. H. H. Hay Cameron, W. J. Byrne, William Crooke, George Davison, Adam Diston, J. Gale, A. Horsley Hinton, Richard Keene, H. P. Robinson, Ralph W. Robieson, Lyddell Sawyer, Frank M. Sutcliffe, Robert Slingsby, Robert Terras, Henry Van der Weyde, G. West & Son, W. W. Winter. Photographers are invited to contribute exhibits, which should be sent, carriage paid, to the Secretary of the Exhibition, at the School of Science and Art, Lincoln.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

NOVICE (Leeds).—The "stain" is due to light getting into the dark slide through the top of the shutter groove.

A. P.—To our knowledge there is nothing on the market resembling the screen of which you send us a photograph. It would possibly be a commercial success.

W. HARVEY.—If the sulphite of soda was in the form of a white powder, it no doubt accounts for your trouble. A village chemist's shop is not where we should expect to get good sulphite of soda.

S. BOWYER.—It is only by working with the best materials that you can expect to obtain the best results. You had better procure those specially prepared for the purpose, notwithstanding that they are somewhat more costly, particularly in the experimental stage.

EXPERIMENTALIST asks if bitumen more sensitive to light than that usually sold, namely, that which has been treated with ether, &c., is to be had commercially.—We believe it is. We fancy it is supplied by several London dealers.

E. T. CUMMINGS.—The stains on the negatives arise from imperfect fixation. It is not sufficient to leave the plates in the hypo till all the bromide of silver has disappeared. They should be allowed to remain as long after the bromide is dissolved as the time it took to dissolve; a little longer does no harm.

LINCOLN.—Probably the fault lies with the negatives. To obtain good reproductions of engravings, the negatives must be strong, with the lines as nearly bare glass as possible. The best results with this class of work are got with wet-collodion negatives. With dry plates, only those specially prepared for photo-mechanical work should be used in copying engravings.

ALOE.—Clearly the shutter does not work quick enough. Considerable movement of the figures is apparent, while the plate is much over-exposed. You say the shutter was set for its quickest, and, as we know that it is one of the most rapid in the market, we cannot but surmise that there is something that retards its movement, such as dust, or maybe some portion is slightly bent.

BROMIDE says: "I have a ten-inch focus portrait lens, with both back and front combinations measuring three inches, no name on mount, but the stops and under side of the lens mount are marked with the letters 'L. C.' Can you tell me from this who is the maker of the lens and the value of same?"—The maker of the lens was Coiffier, of Paris. It is probably an excellent instrument.

S. K. G. says: "Kindly let me know if 'immersing bromide prints in an alum bath to harden' is calculated to render them more liable to fade; and, if so, would subsequent washing in clear water prevent it?"—We do not apprehend that the proper use of an alum bath with bromide prints is likely to conduce to fading, hence subsequent washing is of little consequence in that connexion.

M. FRANKE.—There need be little difficulty in photographing the collection of old china if you are careful in illuminating the subjects. Reflection and false light must be avoided. A single lens, or one of the rapid type, will answer very well. The formula quoted is an excellent one for treating the plates by. A pale yellow screen should be used with them. Give a full exposure, but do not over-expose.

FITZ B.—1. For copying oil paintings, orthochromatic plates are necessary. 2. There are several manufacturers of gelatino-chloride paper whose advertisements will be found in our outer pages. 3. We cannot tell you where to find the description "of a self-made good lantern for the dark room." Surely, out of the numerous advertisements of dark-room lamps, you should be able to select one suited to your requirements.

RICHARD PAINTER (Blandford) asks if double albumenised paper and thickly albumenised paper are not one and the same thing.—No. A paper may be thickly coated without being doubly coated, and *vice versâ*. The double method strictly consists in applying albumen, whether salted or unsalted, to the surface, and then coagulating this by steam or analogous means, the salted albumen being then applied. It is evident that this latter cannot sink into the paper, but must remain on the surface, thereby conferring brilliance.

NOVICE IN CARBON complains that he cannot succeed in getting his carbon prints to adhere to the temporary support for development, and asks the reason.—There may be more than one reason for the trouble. 1. It may be that the "safe edge," that is protecting the margins of the negative from the action of light by means of strips of opaque paper or black varnish. 2. The tissue may have become insoluble, in which case it will be impossible to make it adhere. 3. Possibly the tissue was allowed to remain for too long a time in the water before it was squeegeed on to the support. These are the principal causes of this trouble.

J. WESTWOOD asks if any English firm supplies paper *ready prepared* for printing by the Woodburytype and Stannotype processes. He says "he believes it is the usual Rives paper, which has undergone a special treatment with shellac and heavy rolling, and is told it is not to be had in this country."—The paper, ready for use, is an article of commerce in some parts of the Continent. Liesegang, of Düsseldorf, if we mistake not, supplies it. Possibly, however, some firms who work Woodburytype here will supply the paper.

R. A. J. writes: "Can you tell me if the large negatives, reproductions of the paintings in some of the Continental galleries, from which the excellent prints to be seen in the shops abroad and sometimes here, printed in carbon, are by the wet-collodion process or on dry plates? I presume, whichever process is employed, the plates are orthochromatised."—The majority of the negatives of the class referred to, if not all, are by wet collodion. The reproductions of our National Gallery pictures by Braun a few years ago were by the wet-collodion process. In all cases the plates are orthochromatised to obtain the fine effects we see.

P. BOWMAN.—Supposing the varnish be the ordinary spirit varnish, which is usually employed for negatives, there need be no difficulty in removing it so that the negative may be intensified. Place the plate in a dish of strong methylated spirit, and let it soak for a quarter of an hour or twenty minutes, with occasional rubbing with a tuft of cotton wool. Then empty away the spirit and apply fresh, and repeat the operation. Then rinse the negative with a little fresh spirit. If by this time the whole of the varnish is not removed, more spirit must be used. In very obstinate cases a small quantity of caustic potash may be dissolved in the spirit to increase its solvent power.

F. E. G. says: "I want the loan of some good negatives from which to make enlargements. The subjects must be interesting to the general public—views, figures, cherubs, sculpture, &c., photographs of good steel engravings or pictures that are not copyright. I would be much obliged if you, or any of your readers, could advise me how best to obtain such negatives on reasonable terms. I enclose for your inspection a photograph on which the name and address has been photographed. I have no intention of registering this novelty, but would be glad to have your opinion as to whether this style could be made copyright."—1. We can only advise you to advertise for such negatives as you require. 2. Copyright is only applicable to the pictures themselves, not to the style in which they are done.

H. WILLIAMSON sends us some photographs of prize medals gained by a business firm, who intend to use them for advertising purposes. He says: "The people have returned them, saying that they are of no use, as they are not good enough. I enclose a print of some coins they have sent me. They say, unless my work is as good as these, they will cancel the contract. Now, I must confess that my work, as you will see, is not nearly so good as that forwarded by them. Can you kindly suggest any means by which I can obtain a better result? I shall esteem it a favour if you will please return the prints in the stamped and addressed wrapper."—The specimen print is certainly very much better than the other, and there is a very good reason why it should be. The negatives were not made direct from the coins, but from reproductions of them in plaster of Paris, hence their superiority. Our correspondent should get his customers to have their medals so reproduced in the same way, then he will be able to get a similar result. Usually the plaster of Paris is slightly tinted with some dark pigment, such as burnt umber, to take off the excessive whiteness, which is an assistance in the work.

PERPLEXED says: "Will you please give me your opinion of the stains on the enclosed prints. We have been troubled with them now for some weeks. They do not appear on all the prints in the same batch. For the first few weeks they only came on the cabinets, now we have them on different sizes. I may say the mounts we are using are the last of a large stock, and we have never been troubled with marks or stains until now. Before mounting, the prints are clean and good. If they are kept unmounted for weeks, they are still the same. The prints are thoroughly washed, and every care is taken as regards cleanliness in every process. We always mount with starch. Now, we have tried different makes, Glenfield Photographer's Starch included, but the stains are just the same. Now we are at a loss what to do, and should be glad if you could help us out of the difficulty."—It does not appear that the mounts are at fault, although they may be. Any impurity in them could only be detected by chemical analysis. The stains are similar to those produced by imperfect fixation and washing. Mount the half of a print on one of the mounts, and compare it with the half print that has not been mounted at the end of a few days, and let us know the result.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—At the Technical Meeting, May 24, the properties of the new concentric lens of Messrs. Ross & Co. will be demonstrated. Members are invited to bring their best lenses for comparison with it.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—May 26, *The Photographic Study of Clouds and Lightning*, illustrated by slides, Mr. A. W. Clayden. June 2, *The Tele-Photographic Lens*, Mr. T. R. Dallmeyer. 21, Outing to Eltham.

PHOTOGRAPHIC CLUB.—May 25, *Developers for Bromide Prints.* June 1, *Photo-micrography*, Mr. T. Charters White. Outing next Saturday (21st inst.) to Eltham, under the guidance of Mr. E. A. Newell. Train from Cannon-street at fifteen minutes past two.

CONTENTS.

THE BRITISH
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No. 1673. Vol. XXXIX.—MAY 27, 1892.

LENS DIAPHRAGMS FOR BINOCULAR CAMERAS.

As to the utility and convenience of the Iris diaphragm there will not be two opinions. But this useful appendage to the lens may prove quite different when applied to a single and to a double-lens camera. The lovely smoothness with which the leaves fold and unfold in response to the touch of the button or the rotating ring outside is such as to charm every one who has once experienced its use. And yet this very facility of movement and adjustment may, and often does, prove hostile to its effective employment in the case of stereoscopic cameras.

It is exceedingly difficult to adjust, by means of the engraved graduated index-ring outside, a pair of lenses so that each shall be identical with its fellow; and, unless they are absolutely identical, there will be a lack of equality between the two pictures, one receiving a relatively longer exposure than the other. In some cases even the engraved lines of the index circle are, assuming their accuracy of position, of such a breadth that the mere adjusting the arrow-head to the one margin or the other of the line will cause a difference.

For this reason we have always recommended, and employ, Waterhouse diaphragms in the lenses of our stereoscopic camera. And even these diaphragms are not altogether an unmixed blessing, especially as supplied by our best opticians at the present day. They give us too much for our money. A multiplicity of stops, each differing from another in but a slight degree, is apt to bewilder; and our advice to a tourist using a binocular camera is to select only three, or at most four, and leave all the others at home. Nay, more, he will greatly consult his convenience by "pairing" his stops so as to render it impossible for dissimilar ones to be employed even when working under the greatest conceivable pressure of time.

Let us explain. At a cursory glance there is no appreciable difference between, say, *f*·27 and *f*·32, that is, when the stops are merely looked at, and their dimensions estimated without examining the figures, and such an unequally matched pair may be, and to our certain knowledge have been, worked simultaneously, with the result that one picture is more fully exposed and denser than the other, and wise men, at the societies or clubs where they are exhibited, account for the difference by the supposition that one lens must have become discoloured without its being apparent, and therefore slower in action. The system of pairing stops which we recommend is simple in the extreme. It consists in removing the black, by means of emery paper, from the thumb piece of each alternate pair of stops. Thus, selecting from the battery of diaphragms, say, *f*·32, *f*·22, *f*·16, and *f*·11, the thumb pieces of the first and third of these will be black, while those of the second and fourth will be bright brass, rendering a mistake as between adjacent sizes quite impossible, as a bright stop in one lens, and a black one in the other, would indicate inequality. It need scarcely be said that this brightening must only apply to the projecting thumb piece, and not to the area of the diaphragm.

We have spoken of the difficulty that may arise in the case of having a pair of lenses with Iris diaphragms accurately matched. But this may be effected by the application of the check system now so frequently adopted with iris diaphragms, by which at certain apertures there is a check to further rotation by the action of a spring point falling into a notch. If this were made sufficiently stiff, and identity between the two lenses could be relied on, this would serve the purpose; but only equalling the efficiency of Waterhouse stops to which the pairing system we have just described has not been applied, for there would still be the possibility of one size being employed in one lens, and another in the other. The real remedy, could it be easily effected, would consist in having the pair so connected one with the other that both would be automatically operated by one movement. So much mechanical ingenuity exists among opticians and photographers that we do not doubt of this desideratum being accomplished.

THE PRESERVATION OF MODERN PRINTS.

The question of the permanency, comparative or otherwise, of modern prints by various processes is one that is constantly recurring; but, in most of the discussions that have taken place, the major portion of the attention has been devoted to the stability of the image itself rather than to that of the support. In other words, the point that has been the more carefully considered is whether the metallic or other deposit forming the image is subject to change with lapse of time or under stress of atmospheric conditions, while the inalterability of the paper support has been comparatively ignored. It is true the question of the possible discolouration of the paper from one cause or another has been discussed on more than one occasion; but this class of deterioration is more particularly connected with the photographic side of the question, since it generally arises from faulty manipulation, and may therefore be placed under the heading of fading or alteration of the image, but the physical deterioration of the support itself has scarcely yet been adequately considered.

In confining ourselves to modern prints, we do so because the fading of albumen prints has come to be almost universally, and perhaps correctly, set down to the liability of the albumen itself, not only to decompose, but also to form silver compounds that are peculiarly liable to decomposition, both spontaneously and under slight atmospheric provocation. Silver images in collodion films have long been regarded as far more permanent than the ordinary albumen prints; indeed, it has been claimed for the developed collodion negative image that it is absolutely permanent within the limitation we have already referred to.

Similarly it has been alleged in favour of gelatino-bromide and chloride pictures that they are, if not absolutely permanent, at least practically so, partly in the case of developed prints, by reason of the different composition of the image, but mainly because gelatine is supposed to be free from the peculiar tendency of albumen to decomposition, and to the formation of decomposable products. This may or may not be the case, but there is probably a good deal of truth in the claim; still, it may be asked, is gelatine itself wholly free from reproach in a physical sense, or, for that matter, even chemically?

Personally, we are very far from taking that view; on the contrary, given two prints, one on albumen paper and the other with gelatine as the basis, equally carefully treated in preparation, and equally free from chemical impurities, we consider that the albumen print is better calculated to stand the ordinary vicissitudes of our climate than the other. This may appear to many a strong if not a reckless statement, but let us say a word in explanation of what we really mean. What *are* the "ordinary vicissitudes" of climate in this country? Well, damp is certainly the first, and changeability, both as regards temperature and degree of moisture, comes next. Beyond these, the abnormal conditions to which a print may be submitted cease to be ordinary, and if we choose to hang our photographs in an atmosphere of sewer gas, or in a chemical factory, we must expect them to suffer. Alternations of heat and cold, of dryness and moisture may therefore, we think, be safely taken as representing the conditions to which the majority of photographers are subject.

Now, which, we ask, is the more likely to pass through a lengthened exposure to such conditions without change, pure coagulated albumen or pure gelatine? We are treating the respective prints as if they were theoretically perfect, that is, consisted only of pure gelatine or albumen and metallic silver, or some perfectly insoluble and equally inert compound thereof. If it is not possible in practice to attain to this state of affairs, it is no more difficult to make a fairly near approach to it with albumen than with gelatine; perhaps, really, it is easier. Now, pure coagulated albumen is one of the least changeable of all the forms of animal organic matter, and little, if at all, subject to decomposition from moisture; while pure gelatine—well, perhaps the less said the better. Gelatine, even when hardened as completely as it can be with ordinary or chrome alum, is still very subject to swell and change under the action of moisture; but the treatment to which the majority of prints are submitted, even when they are "alumed," is scarcely such as to ensure the maximum burdening effect being attained.

A wide difference is to be recognised, however, between developed and printed-out proofs. Not only has the hardening effect of the development to be taken into consideration in the first case, but it is an almost universal practice to use alum in the preparation of the emulsion, and also in a clearing and hardening application to the print after development. On the other hand, the printing-out papers have usually perfectly soluble films, better colours being obtained under such conditions, and are also deprived of the indurating action of development, while alum may or may not be used after toning and fixing; so that, on the score of hardness alone, the developed print would seem to have a better chance than the other.

But emulsions for development are made under such conditions that the gelatine is seldom or never for long submitted to the action of free silver, while the printing-out emulsion contains as one of the essentials to its successful use an excess of soluble silver salt, and this exists in the film itself in a more or less dry state until the time comes for toning. Here, then, we can foresee a greatly enhanced opportunity for the formation of dangerous silver compounds which, though they may show us immediate signs of their presence, may still be there to work injury in the finished print if aided by warmth and moisture.

It is many years since the practice was introduced in connexion with albumen prints of impregnating them with some substance more or less impervious to water or moisture in order to render them less liable to deterioration from such influences. It is not necessary to cite instances of the value of such treatment, it may suffice to say that such simple treatment as coating with collodion, polishing with wax or encaustic paste, a preparation of wax or the more elaborate system known as enamelling, have all been proved to add to the permanency of a silver print, though not to render it altogether unalterable.

From what has been said respecting gelatine it seems more than ever necessary, or, at least, desirable, to apply some such treatment in order to render the prints as little subject to change as possible; for, while it may fall short of rendering them absolutely permanent, it is very little trouble, can do no harm, and serves to impart a feeling that we have at least done the best we can.

The methods we have enumerated in connexion with albumen prints are equally applicable to gelatino-bromide or chloride surfaces; but their preservative effect is far inferior to that of another method we shall name, and which with gelatine is infinitely more effective than even with albumen. We refer to the application of a coating of aqueous solution of shellac, made by dissolving bleached lac by boiling in a weak solution of borax. This forms a pale yellow solution, which dries without colour upon paper, and forms a perfectly insoluble film, is perfectly flexible—short, of course, of actually creasing the paper, when, of course, it will break, and, in fact, making the print as nearly waterproof as anything will. It may be made to dry without gloss, or, if preferred, a high glaze can be given to the surface, and it is equally applicable to the smoothest and roughest papers.

But the chief point of advantage in its use is, that whereas with an albumen print the coating of varnish would be entirely on the surface if the print were floated, or in the pores of the paper in addition if immersed, in the case of gelatine, floating alone suffices to thoroughly *impregnate the gelatine film* with the waterproofing material, and the treatment may be extended to the paper support or not, as preferred. The fact of the pores of the gelatine being filled with shellac ensures that the individual particles forming the image are surrounded with waterproof material, and so at any rate approximately isolated, and thus, if the seeds of change should exist within the film itself, their power for harm is greatly lessened, if not altogether destroyed.

The varnish is made by dissolving about one hundred grains of borax in a pint of water by boiling in an enamelled saucepan, and when dissolved adding an ounce of good bleached lac broken into small fragments. Continue boiling and stirring until the shellac is dissolved, then filter first through muslin, then through bibulous paper, and finally set aside for some days until a fine sediment falls, and leaves the solution clear and bright, of a pale straw colour. It may be made stronger or weaker, as desired, using the borax and lac in the proportion of about 1 : 5 respectively.

On this varnish the print may be floated, or it may be

altogether immersed, and then hung up to dry. We prefer to dry the prints first, and immerse them in that state in the lac solution until quite limp, then pin up to drain and dry.

USE AND ABUSE OF THE HAND CAMERA.

Close observation convinces us that the hand camera in some form or another is destined to keep its present popularity for a considerable time, inasmuch as the uses to which it is specially applied are not likely to disappear before the means of ministering to them. As an item of the tourist's or traveller's outfit, as the companion of the artist, the newspaper correspondent, the architect, and the antiquary, and many others, the hand camera has, as it were, opened up for itself a field of indispensability which the stand camera would never, *per se*, have been capable of creating or occupying; and it is on these grounds that we are induced to predict a long lease of life for it rather than on its partial supersession of the ordinary camera among those who fail therewith to secure the *desiderata* of lightness, compactness, and portability in combination with efficiency as an instrument of precision for different kinds of photography.

Among those photographers, however, to whom the employment of the hand camera is not dictated by a necessity equally as great as that which obliges the classes of persons previously mentioned to confine their photographic work to the fruits of that instrument, we are not confident that the latter is sure of a continued popularity. It is seldom that we find, amid the enormous number of photographs taken by means of the hand camera, that the quality of the work, either in an artistic or technical sense, approximates to that which is executed in the usual way, although we hasten to allow that there are a large number of photographs so produced which are at least creditable on those two counts. But of really good hand-camera work there is no plethora. We have invariably found that that which fairly challenges comparison with the best stand-camera pictures is the production either of men of exceptional skill, who have devoted a large amount of time and study to the proper use of the hand camera, or of those who are equally expert in picture-making in the common method.

It is consequently, because it appears to us that the production of the finest quality of results with the hand camera demands a high degree of skill in addition to that necessitated by stand photography, and which is, therefore, doubly difficult of acquirement, that we should not be surprised if, in course of time, the hand camera for ordinary work was quite relinquished by those whose aspirations it failed to assist towards realisation. At present, such cameras are largely employed under circumstances which preclude good pictures being made except by a miracle. For example, they are much used for taking difficult architectural and dark landscape subjects pure and simple, without any moving figures in the pictures, for interiors, and for groups. We leave our readers to conjecture how often, in the first case, the lines of the subject escape distortion, how near to correctness the exposure approximates in the second and third, and in the fourth how the grouping and lighting are satisfactorily accomplished without the aid of a focussing screen.

In such work as this the hand camera, particularly in the case of those of only moderate ability, takes away in technical or artistic qualities what it gives in portability and convenience. For its thoroughly successful use, it entails the expenditure of a fund of common sense, thought, care, and downright cleverness which far exceeds the average possession of these qualities. On the single score of exposure, we maintain that, for most subjects, excluding moving figures, the drawback of not being able to carefully examine the image on the screen deprives one of the power of exercising that judgment which, in the absence of artificial aids, is absolutely essential to giving approximately correct exposures with any degree of certainty. Hence it is that we so rarely find hand-camera work properly exposed. As to pictorial composition, careful selection of subject, arrangement of light and shade, and proper proportion of picture, they, if not out of the question, are rendered vastly more difficult of attainment with a hand camera than otherwise. In short, the hand-camera worker's mind is, by the necessity of his position, too often *in* his camera and its appurtenances, instead of in the picture, with disastrous results to the latter.

The sphere of the hand camera is, as we have already remarked, clearly defined. Besides those to whom it is a constant *sine quâ non*, it has a distinct claim upon the ordinary amateur worker at times, as, for example, in street scenes, in animal work when it is necessary to follow up the subject, and on many other special occasions when the use of a camera on a stand would be out of the question. In these respects the hand camera—though the quality of the pictures must too often partake of the nature of compromises—occupies legitimate ground, and we believe, considering the ingenious mechanical improvements of which it is constantly the subject, will continue to do so in the future to increased advantage. By no means do we wish these remarks to be accepted as intended to deter the users of hand cameras from this kind of work; on the contrary, we indicate such a field of photography as one to be cultivated with every assiduity. That is a proper use, and not an abuse, of the hand camera, and we applaud it.

At the commencement of the season for outdoor work we have perhaps not unfittingly invited attention to the fact that hand cameras are too often employed on subjects which lie peculiarly within the domain of the stand camera. One fact more than another confirms us in our view that ere long the hand camera will be largely abandoned by those who abuse it in the manner we have pointed at, and that is the unsatisfactory nature of the pictures it invariably yields in ordinary hands. Where it is always possible to produce better work with less trouble, there surely may we look for dissatisfaction; and, as dissatisfaction is a strong incentive to progress, the moral will doubtless not be lost on many hand-camera workers. There is a proper place for the hand camera in photography, which we have clearly traced out; but, when it is employed on stand-camera subjects pure and simple, we are not sure that photography is not harmed rather than benefited by the facilities it affords of degrading its capabilities for picture-making.

A New Fixing Agent.—We are informed that a new fixing agent in place of hypo will shortly be introduced by a firm of manufacturing chemists. The nature of the compound is, so far, unknown to us, except that it has an acid reaction, and that it will work at a higher degree of dilution than the hypo solution.

Fine Art Exhibition.—The sixth International Exhibition of the Fine Arts in the Crystal Palace, Munich, which will open to the public on the 1st of June, is, we are given to understand, one of the finest hitherto held. As the Bavarian capital has always been a home for fine art it, would be surprising if its exhibitions were not great successes. Etching and engraving find a place in the Exhibition, but

not photographs or photo-engravings. It is a little surprising that the latter do not, for the art is worked to a higher state of perfection in Germany, perhaps, than in any other part of the world. More particularly is this the case with the reproduction of paintings both by the old and modern masters. However, photogravures are not shown.

Old Presentation Prints.—*Apropos* of the recent exhibition of very ancient silver prints, it used to be the custom with most of the old photographic societies to give a presentation picture to its members annually. These pictures were generally about the best photographs that could be obtained at the time. The negatives were made by various methods and modifications, and the prints sometimes by one process and sometimes by another. Now, there must be thousands of these prints still in existence. If a collection of them, whatever be their condition, could be got together, it would be interesting, as well as instructive. In a measure it would illustrate the state of the art, at its best, at certain periods, and what was done by different processes; also, in the case of prints by the various methods, how they have stood the test of time.

To Prevent Unsightly-looking Bottles.—Most photographers have an experience of the untidy and unsightly appearance of the bottles on their shelves, caused, after pouring, by the running down of a portion of the contents over the sides of the vessel, and crystallising there, or perhaps sullying the label. According to a correspondent of the *Chemical News*, this can be entirely obviated by simply painting the lip or rim with melted paraffin. Care should be taken to cover only the side of the lip—none should be put on the upper surface. It can be accomplished most easily by using a small hog-hair brush, and a wax of low melting point, such as is used for embedding sections. It will be found that, besides preventing the solution trickling down the outside, it enables the reagent to be delivered in single drops, without resorting to the plan of partially withdrawing the stopper. Those who have vainly endeavoured to deliver drops from the mouth of a bottle will appreciate the advantage of the latter recommendation.

The Aërial Graphoscope.—At a recent meeting of the Physical Society was exhibited, as a "new instrument for showing the effects of persistence of vision," an apparatus under the above title, which, we presume, is the same instrument (or a similar one) as that exhibited at the last exhibition of the Photographic Society of Great Britain in Pall Mall. It consists, as visitors to the Exhibition will remember, of a narrow wooden lath mounted on a whirling machine so as to be rapidly rotated in its own plane. When rotated it presents the appearance of a nearly uniform screen or disc, owing to the persistence of impression. For exhibiting the latter effect the instrument is, of course, a useful, if cumbrous, affair; but for practical lantern projection it is, as we have before pointed out, practically worthless. The loss of light is, perhaps, ninety-five per cent., and there is the further disadvantage of this ninety-five per cent. going to illuminate the rest of the room, though, of course, it would be practical to place a black-velvet screen behind to absorb this; but then the *raison d'être* of the machine would be gone.

Photochemical Action.—Messrs. P. Askenasy and Victor Meyer have been experimenting upon the action of light upon mixtures of gases capable of detonation. Of particular interest to photographers are those upon the photo-chemical induction of chlorine. They say that, in regard to Draper maintaining that a chlorine-detonating gas, composed of chlorine and hydrogen, previously exposed to the action of light, possesses the power of continuing to form hydrochloric acid even in the dark, their experiments prove the observation to be incorrect. Bunsen and Crowe have rejected the observation as being incorrect, showing that chlorine which had never passed outside the laboratory through a glass room exposed to the heat of the sun, and was then mixed with hydrogen similarly treated, remained inactive on mixture with the latter in darkness. The first-named experimenters, in order to remove every possible objection and element of doubt, repeated these experiments with every precaution against possible contamination of the gases, and made the exposure to light continue for several hours, concentrating the rays of the sun (in July) by a concave mirror. No combination or production of hydrochloric acid occurred.

A Unit of Measure of Light and Colour.—At the Physical Society, Mr. Joseph W. Lovibond read a paper on this subject, and illustrated it with diagrams, models, coloured charts, &c. The principle of the measurements depends on the selective absorption of the constituents of normal white light by coloured glasses, red, yellow, and blue. The depths of tint of the glasses are carefully graduated to give absorptions in numerical proportions. For example, two equal glasses, each called 1-unit red, give the same absorption as a 2-unit red, and so on. The units of red, yellow, and blue are so chosen, that a combination of one of each absorbs white light without colouring the transmitted light. Such a combination he calls a "neutral-tint unit." By the use of successive neutral-tint units, white light can be gradually absorbed without showing traces of colour, and the number of such units required to produce a complete absorption is taken as a measure of the intensity or luminosity of the white light. The influence of time of observation on the penetrability of different colours was illustrated by diagrams, the results of 151 experiments in colour being explained. Mr. and Miss Lovibond showed the methods they used for colour-matching and measuring.

An Unrecognised Use of Photographs.—A few weeks ago it will be remembered that a lady was muleted in penalties and costs for lending season tickets of admission to the Crystal Palace to other persons, such tickets being "not transferable." Now, there is no question that season tickets for exhibitions, railways, &c., are very frequently used by people to whom they were not granted, and who have no right to utilise them. Impositions of this kind are very difficult of detection under the present system; but, if photography were made use of, this fraud might at once be exposed. Those granting season tickets, whether for exhibitions or railways, can, of course, fix their own conditions. If one of these were that the holder was to have his photograph attached to it, bearing the Company's impressed stamp, fraud would be next to impossible, and photography, from a business point of view, would be benefited. Many portraitists would be glad to make terms with the companies to take portraits for the purpose at a reduced rate, on the chance of obtaining orders for duplicates. It is rarely that a portrait is taken, if it is satisfactory, that a number of duplicates are not ordered. Here is a hint to railway companies and others. We are quite aware that the idea is not new, and, if we mistake not, has been carried out in connexion with more than one international exhibition on the Continent with success.

What is "Right Exposure?"—At the present time there are before the photographic world various "exposure tables" and different forms of instruments for gauging the quality of the light, their object being to enable the inexperienced worker to rightly time his exposures. Now, if we examine these several tables and instruments, we find there is a great diversity between them. Yet each have their advocates, who assert for them that they are perfectly reliable. Now, how is the discrepancy to be accounted for? Perhaps it may be from the great latitude of exposures allowable with modern dry plates. Any error within reasonable margin may be compensated for in the development. But this is not all. Ideas as to what is a correct exposure differ widely. Given three workers—not novices—with the same plates, if they, independently of one another, took the same view, the chances are that they would all give different exposures, and that difference might vary as much as two or three hundred per cent. Yet each would produce good printing negatives. Some operators go for a minimum of exposure and a somewhat forced development; while others proceed conversely—give a maximum exposure, and follow what some would term a restrained development. Seeing that both classes of workers get equal results, who shall decide as to what is "proper exposure?" Or is there such a thing?

Safety of Electric Lighting.—The popular belief in the perfect safety from fires of electrical modes of illumination has received several rude shocks of late, so much so as to leave a possibility of the opposite extreme of belief being held. But a lecture recently delivered by a well-known expert, Mr. W. H. Preece, at the rooms of the Royal Institute of British Architects, puts the matter in its proper light. The lecturer admitted that sometimes the light was not safe, but the danger chiefly lay in the use of imperfect materials in cheap contract work. Good design, perfect materials, first-class workmanship, and rigid inspection combined the elements of complete safety. In proof of this Mr. Preece stated that no fires had occurred in buildings fitted up under the rules and regulations, and inspected by the officers of, the insurance companies in this country. Those of our readers who contemplate the erection of an electric-light installation, or the alteration of existing fittings, will therefore do well to remember Mr. Preece's advice that everything ought as much as possible to be kept in view, and that the conductors ought not to be hidden under wainscots or floors, or above ceilings. He further stated that the glow lamps excited by three watts per candle was at present the most perfect source of domestic light, and when the patent expired—in a year or two—would be obtainable at about one-third of the present price.

Unsafe Hotel Dark Rooms.—As the photographic season has now fairly commenced, and during the next few months tourists, both at home and abroad, will frequently have to avail themselves of the accommodation provided at hotels for changing their plates, it will not be inopportune to give a word of caution as regards the light used. This is often of an unsafe character, particularly with highly sensitive plates. Here is a case in point, which has just been brought to our notice. A gentleman, recently travelling on the Continent, wanted to change his plates. He was shown into the hotel dark room. It was illuminated with a window about eighteen inches square, of very deep ruby glass, which admitted very little light indeed. After waiting for the eyes to get accustomed to the almost darkness, it was noticed that what little light there was had a peculiar tint. As our friend would as soon think of travelling without his pocket aneroid as he would his spectroscope, the latter was soon brought into use. It was then seen that, little as was the light passed, it contained a considerable amount of blue and some green—quite sufficient to fog a rapid plate, even with but a moderate exposure to it. However, by working in a corner of the apartment, shielded from the window, the plates were changed in safety. As every one does not carry a pocket spectroscope with him, tourists would do well, when using strange dark rooms, as a matter of precaution, to look upon the light with suspicion, even if it be perfectly safe, and expose the plates to it as little as possible.

Bleached Lac.—The basis of almost all the photographic varnishes, as most are aware, is shellac. Usually the bleached resin is the kind employed. Now, all who have made the varnish know quite well when the ordinary white lac is employed that only a portion of the resin is dissolved, and that a considerable residue remains, which takes a long time in subsiding, and is very difficult to filter out if filtration be resorted to. Another point in connexion with bleached lac of the usual kind is that if it be kept long after it is bleached it becomes brittle and more or less insoluble. This deterioration may, however, to an extent, be retarded by keeping the resin damp. Reference to this subject is brought about by the fact that we were recently shown a sample of white lac that was free from these defects, except that of becoming brittle, but even that did not appear to interfere with its other qualities. In appearance it was silky white. It had been exposed, dry, to the atmosphere for some weeks, and was so brittle that it could be easily broken with the fingers. When an ounce or so was placed in common methylated spirits, it dissolved readily, and made a perfectly clear and nearly colourless solution that proved an excellent varnish. Unfortunately we could learn no particulars about it, except that it was of foreign production, probably German, and was about three times the price of that sold in England. The method we believe usually employed in bleaching lac in this country is to dissolve the resin in a boiling alkali, then add hypochloride of lime, and afterwards pour in some mineral acid. Chlorine is liberated, which bleaches the lac, which at the same time separates largely mixed with lime, which is not altogether separated in the after-treatment. Some years ago the following method was published:—The lac was first dissolved in boiling alkali, then chlorine gas was passed through the solution, when the lac was precipated free from colour. We tried the process at the time, and obtained a perfectly colourless lac, which behaved in precisely the same way as the sample just referred to. Possibly it was bleached by a similar process.

PHOTOGRAPHY IN MILITARY RECONNAISANCE.

The importance of knowing the topographical features of a country where military operations are likely to take place is so far recognised by the authorities that officers have to pass examinations in road-sketching, map-making, and reporting of features of ground prior to receiving appointment on the staff.

Much has been done in the way of simplifying instruments, with a view to obtaining particulars quickly, and making sketches rapidly, but it is freely acknowledged that very few men can draw well, and when they have artistic ability the disposition is to make pretty sketches and maps rather than give *exact* reproductions of what they see. Naturally photography has been considered as a substitute for eye-sketching, and, although only taken up in isolated cases, it has been shown that it is of the greatest assistance in reconnaisance.

Lieutenant F. E. Davies, of the Grenadier Guards, recently read a paper at the Royal United Service Institution on *The Employment of Photography in Reconnaisance*, and also showed examples of maps made of the country passed through during a journey extending over some weeks, in very bad weather, and illustrated the map with marginal photographs instead of the orthodox sketches.

The value of these pictures in connexion with maps was favourably commented on by general officers and professors present at the lecture, for it was at once recognised that if definite particulars were wanted respecting a bridge to be blown up, or a fort to be captured, the style and proportions could be at once gathered from a photograph with but little additional information.

Then, again, with respect to time, a sketch must of necessity take considerable time, even in the experienced draughtsman's hands, and, for the same reason that special correspondents of our leading illustrated papers have recourse to photography to get their details and general disposition of the groups or crowds forming the special subject of interest, so military officers, whose duty it is to report what is going on in the enemy's country in time of war, or for manœuvring purposes in time of peace, will find it of invaluable assistance.

The choice of apparatus is an important matter; but, as Lieut. Davies justly said, as there are no less than eighty different kinds of hand and portable cameras in the market to choose from, there should be little or no difficulty in finding one suitable for the particular purpose required. It must, of course, be portable, and capable of being rapidly and sometimes secretly used. The films or plates must be so arranged that they can be transported great distances without fear of breakage, or suffering from meddlesome tampering prior to exposure, or on being returned for development. As the map is constructed the photograph representing the part desired to be illustrated would bear a number, and when printed would be placed on the position assigned to it by a similar number on the margin of the map. In this way the officer, if need be, could send an orderly back with the map and negatives to be developed at headquarters for the information of the general.

If necessary, development and printing could be done in the field, and by using bromide paper it was shown in about a quarter of an hour after a negative was sent out of the lecture-hall, it had been developed and a print made. A number of negatives could be developed and printed proportionately quicker, and, in fact, it was stated by one of the speakers that five or six had been so treated in half to three quarters of an hour.

For military purposes those troubles so familiar to photographers, such as yellow stains, hardness, &c., may be disregarded, as accurate indications are more important than pretty pictures. The large number of photographs shown indicated very fairly the average excellence of the result, and, when it was stated that some were taken on a cloudy day in February with no sunshine, and snap-shot exposures, it was admitted the claim for recognition of the camera as a military adjunct was fully supported.

It was recommended that the plates or films should be specially

manufactured to stand extremes of heat and cold, and concentrated developers that can be used several times over be employed. Very few dishes need be taken, two, probably, being enough, one for developing and one for fixing.

The paper, as before mentioned, recommended is bromide, for it can be used while the negative is still wet, and when thus used no printing frame is required. The printing, being by artificial light, can be done at night.

It was found that, by lining a military tent with blue material, developing could be well performed by moonlight.

A bucket of water would be required, and for very rapid work the negatives need only be washed for a few minutes, and, after the prints are taken off, providing they are washed for three or four minutes, they will retain their colour for several days. A washing of two hours makes them, of course, permanent; and, when the negatives are required for future use, they should be subjected to the usual washing after the prints immediately required have been taken off. Clearing solution would be used, but no toning is necessary for the prints.

For surveying by photography it is necessary to measure a base line. Take magnetic bearings, and photograph the objects from each end of the base, taking care to level the camera each time, and to observe and record the magnetic bearings of the axis of the lens. By a mechanical arrangement in the camera, the horizontal line and a vertical line, representing the vertical plane, are marked on the negative, and consequently appear in the print. The point where these two lines cross is called in perspective the "principal point," and should agree with the axis of the lens.

The focal length of the lens must be known, and this is equivalent to the distance between the point of sight and the principal point. If we photograph a range of hills, and we wish to plot them on the paper, we draw perpendiculars from, say, the two highest points down to the horizontal line. We then plot the base on the paper, and from each end of the base we draw a line having the bearing (recorded), in each instance as the bearing of the axis of the lens, making each of these lines equal in length to the focal length of the lens; at the ends of these lines further from the base draw lines at right angles to represent the horizontal lines; the ends of the base will be the points of sight, and the points where the lines from the end of the base meet the horizon lines will be the principal points. We now measure on the photograph the distance from the "principal point" to the point where the several perpendiculars from the objects fall on the horizon line, and mark off similar distances from the principal points on horizon line on paper. If we join the end of the base with the points so marked on the horizon lines, we shall be drawing the bearing of the objects from each end of the base, and shall thus be able to fix their relative positions by intersection.

In a similar manner, by the application of this method, we can ascertain height of objects represented on the photograph. This description merely gives the outline of the method by which surveys can be rapidly executed and the triangulation carried out. Lieutenant Reed, United States' Army, has given very considerable attention to this subject, and has published a work on the subject entitled *Photography applied to Surveying.*

It will be, of course, apparent how useful photography will be in time of war if balloons are employed, and also for the reproduction of maps, sketches, or even despatches or instructions, supposing, for the sake of future reference or multiplication, it became necessary and no mechanical process was available.

For measuring the base line, a simple range-finder, such as the "Labbez telemeter," would be invaluable, as it gives ranges at sight in any measurement, and a good prismatic compass, or a Verner's complete sketching instrument, would assist in recording bearings, and the latter for plotting same, and showing vertical as well as horizontal angles.

G. R. Baker.

THE CAMERA AND THE CONVENTION: OR PICTURESQUE SCOTLAND AND PHOTOGRAPHY.

IV.

Crieff and Drummond Castle.

Being now at Callander, before going further west, we might take a run to Crieff for a couple of days. Its surroundings are rich in lovely spots with scenery of such a nature as lends itself to the production of good photographic work. From Callander to Crieff is within an hour and a half's railway journey. Drummond Castle is one of the most prominent points of interest there. We had to get a permit to be allowed to photograph at the Castle. Mr. Curr who was the factor on the estate when we were there (and likely is now) granted us permission with great pleasure

The avenue, garden, and castle are all composed of material for much good work. The garden is a little too trim and formal perhaps, there being a tendency to map it out into designs and patterns, that produces a considerable stiffness in the pictures; but the outside grounds quite make up for any deficiency in this part of the policies. When visiting the Castle we showed our pass to Donald, the Highland custodian; he remarked, "You did not need no pass, I would have let you photograph whatever you pleased." We wanted to have a cabinet bust of this old Highland worthy, he is so well known all round the country side, but thought we had no chance the morning we were there, he was so busy showing a lot of visitors round the exhibition part of the Castle, but remarked in passing, "Some other day, Donald, when we come again, we would like to make a picture of you; we would have done it now but see you are too busy."

"Na, na, I am not too pisy," he replied, "I will be with you in one minute." The bait was evidently tempting, for those visitors were off the premises in an incredibly short space of time, and Donald was with us in his full Highland garb ready to be taken. We got some good pictures of him, and sent him copies which pleased him highly.

Ochertyae.

Then there is Ochtertyre, about a mile and a half from Crieff, the grounds of which are generously open to the public at all times. It is the seat of Sir P. Keith Murray.

The use of the camera is not forbidden in these grounds, and the blending of wood and water is very charming, producing pictures at every turn.

There is a loch in the centre of the park, where boats are supplied to the visitors free of charge.

Water lilies were growing in patches every here and there, and swans in great numbers were gracing the surface of this loch at the time of our visit.

Within a radius of three miles there are two or three waterfalls, wild enough and picturesque enough to well repay a day spent amongst them. The most prominent falls are Spout Hoich and Barvie; and, for streams, there are the Turret, the Keltie, and the Shaggie, all possessing considerable interest and beauty.

Comrie.

If the stay at Crieff extend for a day or two, places of photographic interest will be found all round. The village of Comrie lies some six miles further on, on the north bank of the Earn. This small town can be reached by two roads, equally picturesque. The one passes the grounds of Ochtertyre, and the other is by the foot of the town. Comrie is a village famed for its earthquakes. It is a quiet, sleepy place, looking as if it would be none the worse of an earthquake now and again, just to shake it into life. After exposing a few plates here, another drive of six miles brings us to St. Fillans, which is situated at the foot of Loch Earn. You will remember, when going up the Oban line, we touched at the head of this loch. The other end, which we have now reached, is equally beautiful, and there is no lack of pictures to be taken—as long as your plates hold out.

And now we had better retrace our steps, and start again from Callander.

Lake of Monteith.

The next outing should be to the Lake of Monteith. On leaving Callander for Loch Venachar, you will remember we turned to the right at the end of Bridge-street; on this occasion we turn to the left, keeping the river Teith on our left hand the first two or three miles of the way. The drive to the Lake of Montelth from Callander is about six miles. On the first part of the way, for a mile or two, the Teith is fairly near the road. It is profusely wooded, and gives opportunity for considerable choice of subject. But after this we have to strike over the hill to the right, and for some three miles on there is not much of importance photographically, the hills being bare and heathery, no trees nor foliage of any kind until we reach within a mile of the loch, when a glorious view bursts upon us as we reach the incline of the hill. A fruitful valley surrounded by hills, where the village and the lake lie basking in the summer sun, the church spire peeping up from amongst the trees, the hotel nestling amongst the foliage by the margin of the lake, while in the distance the island of Inchmahome lies sleeping midst the rippling waters that surround it.

The Isle of Rest.

The Port and Lake of Monteith are of peculiar historical interest, for at Inchmahome (the Isle of Rest) Mary Queen of Scots spent some of the earlier years of her life, and it was to this place that her mother sent the four Marys to be her companions, to help to brighten up so quiet and secluded a home.

This island is the chief attraction of the place, and here stand the ruins of that monastic institution where Mary dwelt. The ruins are well arranged for pictures, with windows and doors in and about, that are just in a perfect state to please the enthusiast who revels in the ruins of the architectural work which in its slow decay still keeps telling us the story of the past. And for those who look at the matter from a more romantic point of view there will be found the hawthorn that Mary planted, and the summer-house where she sat, which are shown as objects closely associated with the pleasures of the girl queen. Many artistic bits will be found on this island quite free from the ruins.

Boats to convey you to the island can be had at the hotel, and a row of twenty minutes will take you there. The village itself is small, but very pretty, and many charming studies are to be met with without the trouble of seeking for them.

Aberfoyle.

Leaving Monteith, and driving on for other six miles, we arrive at Aberfoyle, the spot so intimately associated with Scott's Rob Roy—a spot that has been visited again and again by all sorts and conditions of photographers. And we have never been able to discover why so many people go to this place from a picture-taking point of view.

It is rich in story, certainly, but very poor in scenic effect; and we feel that the land of the McGregors at this spot is not inviting, and in the clachan they have taken to building houses, and that of such a *poor-house* type that it tends to make the place look worse than ever.

Of course, the Bailie's poker still hangs to the tree at the side of the hotel—but one can't make a picture of that—and the bridge close to the hotel has been photographed by everybody, and at the best it is not much. Upon the hill at the back of the hotel there is a little row of thatched-roofed, dry-stone-built cottages, that make a good picture with the auld kail-yard situated at the end, surrounded by the broken-down dry-stone dyke—all broken down and filled with thorn bushes in parts—a kind of unkempt decay that helps up a picture wonderfully.

Loch Ard.

Leaving the Aberfoyle Hotel, we take the road to Loch Ard, which lies in front about two miles further on.

On the way there will be found one or two typical cottages of the "White-Wand-at-the-door" class; and it is worth having a peep at the interior of one of these, for it will at once explain why Major Galbraith and his Highland friends raised such an objection to have the Baillie and Francis forced upon them when they by custom had engaged the house, for really the smallest company would fully *occupie* the place.

To the left on this road to the loch is an old mill with a broad wood water-wheel, and a little waterfall alongside of it, which makes a good picture. Loch Ard itself is worthy of a visit. Along its banks many picturesque bits are easily obtained. When we visited this spot, we had no boat, and felt the want of it very much, for it would have helped us considerably in breaking up the expanse of water in some of the pictures we took.

From Aberfoyle there is a route to Loch Katrine over the mountains by coach; it is some four or five miles' journey. This hill road is interesting for slate quarries, Rob Roy's Well, &c., but there is really nothing of any photographic interest till taking the downward turn of the hill on the forther side, when all at once the wild profusion of beauties that grace the Trossachs Valley unfold themselves to view—a scene so bewilderingly grand that will never be forgotten. But we will take the Trossachs from the Callender side, and pass through those scenes we only view from the distance here.

This hill journey was the one taken by one of the trips at the Glasgow Convention, and a very good day we had of it then.

The Trossachs.

Leaving Callander for the Trossachs, at the turn of the road we cross the Leny, with Benledi lying to the north. On the left, across the Teith, stands the Hydropathic, which looks well in the distance, set in foliage of many different tints. Near to the road, as we drive along, we come to Coilantogle Farm, where, in front, at the foot of the hill, is Coilantogle Ford. This spot we visited on a previous trip. The view of Loch Venachar is now much better seen from the high road. The hillside overlooking the loch is Lanrick Mead, which was the gathering ground of Clan Alpine. The drive to the entrance to the Trossachs proper is some seven miles, and about two miles from there to Loch Katrine. For some five miles of the way the shaggy heath and rocky, ferned mountain-side pretty well hold their own, with spots of Lady of the Lake interest every here and there; but for our purpose specially it is where Glenfinlas turns to the right that the fir-clad hills, and surging streams, and tangled copse, and rocky rivulets crowd upon us from every side, and, if it be caught in sunshine, the glory of it will fill the eye with beauty and the soul with admiration.

Then come we to the Brigg of Turk, and, keeping along the margin of Loch Achray, we shortly reach the Trossachs Hotel, a building that, in its architectural construction, blends well with its surroundings. Going or coming, the coaches wait at the Trossachs Hotel for half an hour, ostensibly to give the tourist an opportunity of lunching or dining; but, as there are many places where refreshments may be had, to the photographer who wishes to go straight on, this little wait gives him the chance of taking a few negatives, and the hotel lies in the very centre of beautiful pictures. The walk from the hotel down to the margin of the lake cannot be surpassed for beauty and magnificence, with Ben A'an towering away towards the north, and Benvenue rising skyward in the front; the boat-house and rustic pier at length come into view, with the loch itself stretching out, with thousands of shimmering reflections playing upon its surface,—

> "With promontory, creek, and bay,
> And islands that, empurpled bright,
> Float amid the livelier light,
> And mountains, that like giants stand,
> To sentinel enchanted land."

To all who are familiar with the Trossachs it will be well understood that a week could be spent there with both pleasure and profit; but, for those whose time is limited, we note the following as the spots the most popular: "The Pier and Boathouse," "Where twines the Path," "Ellen's Isle," "Silver Strand," "The Path by the Loch," with an endless panorama of pictures between, composed of scenery that Scott himself said that he presumed in attempting to describe it—scenery that, when once seen, will never be forgotten.

FIXATION OF SILVER PRINTS.

[London and Provincial Photographic Association.]

I have your letter asking for my opinion as to the best method of ascertaining the period when a silver print may be considered to be completely fixed. I remember making some experiments in this direction some time ago, but unfortunately cannot lay my hands on my notes at the present moment. However, I think I can recall them to mind pretty accurately.

The method generally recommended in the text books is, to examine the print by a transmitted light and see whether all patches or blotches have disappeared, but I cannot regard this as at all a satisfactory way. It is true that with paper of light weight, say the ordinary "Rives," the action of the hypo on the silver chloride is discernible, the proof behaving somewhat like an ordinary negative, but is of course much feebler in appearance. In fact, so feeble is the opacity, that if the paper is at all thick it is difficult to follow the action of the hypo even when designedly applied locally, and with really thick papers it is quite impossible, especially as many of these papers will be found to have in them patches of coagulated sizing that would entirely mislead one. Although, therefore, an instructive experiment, I regard the transmitted-light test as of no practical value whatever. In fact, the aspect of the print by reflected light is equally as good a test, as the surface colour of the print will at once change under the action of hypo. Of course, I am aware that this change is entirely on the surface, and therefore only shows the difference between the action of hypo and no hypo, but this is exactly what the transmitted test does also; the difference is so feeble that it is really only between those parts that have been touched with hypo and those that have not that there is any distinction marked enough to be of use. Now, tests such as these are, of course, of no value whatever, as fixing a print depends not only on dissolving out the silver chloride, but at the same time in also dissolving by an excess of hypo the hyposulphite of silver formed in the print, and this salt being in solution is of course quite indiscernible either by reflected or transmitted light. And this hyposulphite of silver is unfortunately the very point that causes all the damage in non-fixed negatives, as this insoluble salt rapidly splits up and forms a silver sulphide, the characteristic yellowy brown stain giving the print the appearance of having been scorched, as is probably too well known to all photographers.

The proper fixation of our prints is, however, so important a matter, that some experimenting in this direction might well be undertaken. I cannot now remember whether I actually did carry out the experiment, or whether I merely intended to; but my idea was to utilise the well-known test for ascertaining whether paper is properly sensitised (that is, the application of a solution of bichromate

of potash to the back of the print), for the similar task of discovering whether there was any silver left in it after fixing; the action, of course, being the formation of the highly coloured chromate of silver. One of the sulphurets of ammonium or potassium might also be used, in this case forming locally the same silver sulphide; that, allowed to form all over the improperly fixed print, eventually destroys it; indeed, it is not improbable that any acid solution applied to the unfixed print would decompose the silver hyposulphite sufficiently to form the brown silver sulphuret. But, nevertheless, although interesting as experiments, I cannot look on such tests as ever being of practical value. As a rule, they either act too completely, and show traces that would be in practice quite innocuous, or else they act too coarsely; in addition to this, they only show the condition of the one particular spot to which they are applied, unless, of course, the whole print is submerged, in which case the test is something like striking the whole of a box of matches to see whether they are good or not, or rubbing writing to see whether it is dry. Applied to the edges of a print, as such a test naturally would be, it might give quite misleading results, as I find that the most frequent cause of imperfect fixation arises from the prints clinging together in the bath, and thus preventing the hypo getting all round them. In such a case it is perfectly obvious that a test applied to the edges would give entirely erroneous results, and it is for this reason that, in practice, I never by any chance make use of them.

However, the necessity of perfect fixing is so important, that in practice I take great care in this operation, making assurance sure by always passing the prints through a second and fresh bath of hypo. For the amateur who is only printing at intervals, and who therefore does not keep a stock bath, there is no better way, and it ensures, if the bath is freshly made up, the presence of a sufficient quantity of hypo in the print; but with the professional, who keeps a stock bath continually going, the fact alone of leaving the prints a sufficient time in the bath is not sufficient, as it may very well happen that such a bath has become quite exhausted without his perceiving it. But, in the case of this gentleman, it would evidently be quite impracticable for him to test each separate print by any of the former methods mentioned, and he would have really to rely on a test proof, so that, even if he did take this trouble, he would by no means be certain that it ensured the fixation of his prints as thoroughly as he desired.

However, as I do not believe in the practical value of any of the above tests, except, of course, as a scientific experiment, I should give it as my opinion that the most practical method of ensuring perfect fixation is to carry on the fixing for a specified time, turning the prints over once or twice during the operation, and, in the case of a stock bath, taking the very simple precaution of ascertaining that the hypo is in an active state. As a matter of fact, this can be done continuously and without any preparation, by simply watching the aspect of the proofs as they are placed in the bath. If the hypo is active, as every one is aware, they will at once change colour, turning of a much redder colour (owing, of course, to the dissolving out of the soluble blue sub chloride), and the rate at which this change goes on will give a rough indication of the working power of the hypo. The proof is neither delicate nor conclusive, but if the print does not change colour or does so very slowly, it is a gentle hint to the operator to refresh his hypo bath. Of course, in those cases where it is customary to treat the prints with salt before fixing, and where, therefore, the change of colour in the hypo is very slight or entirely absent, the usually recommended test of looking through the print may be reverted to, and the result will be more certain if a small piece of uniformly exposed paper, such as a slip off the trimmings of the prints, be used. In this case, if the surface be not too solarised, there is no difficulty in seeing the line of demarcation between the fixed and unfixed portions either by reflected or transmitted light. To those who may desire a more accurate and scientific method, I would suggest a careful measurement by means of a graduated pipette of the amount of silver chloride that the hypo under examination could dissolve.

I would like here to mention one point that I have noticed in fixing prints, and that is, that if strong, or, indeed, weak hypo be applied locally the print will show a difference in opacity and also in surface colour at these spots, and these marks will be found to be irremovable, even after a lengthy immersion in strong hypo. I do not know whether these spots represent insoluble portions, or whether it is merely a sort of coagulation of the albumen at these points, but would mark the fact as worthy of some future investigation.

I am afraid that I shall not have been able to add much new light to the question at present before your Society, but owing to the press of other business, I have been entirely out of photography for some time back, and therefore find some difficulty in furbishing up my memory and notes of former experiments. LYONEL CLARK.

RATIO OF GRADATION.

I HAVE read with much interest Messrs. Hurter & Driffield's last communication, and beg to thank them for correcting some misunderstandings of mine. On reading their paper again, I find I assumed too hastily that possible loss of energy, in the form of heat, &c., had not been considered by them. In describing e as the amount of energy necessary "to change one particle of silver," I had certainly fully understood them to refer to the visible grains, and not to the particles of very much lesser magnitude which, as now explained, they had in mind. It is very useful to have this correction, as it presents a very different view of their reasoning from that which I had taken of it, and very probably some others of their readers may have gone similarly astray.

I now beg to draw the attention of Messrs. Hurter & Driffield to some misunderstandings on their part. I will first mention that I am described as holding the almost ridiculous opinion that no light capable of affecting a photographic plate will ever escape at the back, and Messrs. Hurter & Driffield kindly give me details of experiments which they invite me to repeat in order to be convinced of the falseness of such views. I have tried the experiments suggested, although it was scarcely necessary, and find, what of course every one would expect, that a sensitive plate exposed behind another, after a full exposure, will receive a considerable impression; but, if the exposure is only sufficient to produce a *small density* on the front plate, then no visible image can be developed on the other, so that, in the latter case, greater thickness of film in the front plate would have led to no greater density in the image. This Messrs. Hurter & Driffield will find, if they will kindly look through my article again, is all that I asserted. I do not, however, rely much on that fact, as, since writing, I have been studying the "correct formula" again, and find that the difference in calculated results for small densities produced by increasing "O" to any extent is very trifling unless an exceptionally thin film be considered. The charges of shifting my ground and wandering from the point, like the one I have just dealt with, are hardly, I think, justified. In my first letter I referred to an article of Mr. Plener's, in which I may mention he, in writing on the subject of sensitometer screens, gave *two* formulæ as applying to the relation between the amount of colouring matter present and the transparency resulting. The first (altering the symbols) was $T=\epsilon^{-x}$, which he considered to be correct in those cases where the thickness of the film varied proportionately with the colouring matter, and the other, which (in a simplified form) is the one I have previously given, he showed applied when the thickness of film was always constant, and only the amount of colouring matter contained in it was varied. That he was perfectly right in those views is still my opinion. The formula which had been adopted by Messrs. Hurter & Driffield to explain the relation between silver and transparency in photographic plates was identical with the first, but I was then of opinion that the conditions were such that the other was the more nearly correct, although, at the same time, I thought it was very doubtful whether either was to be depended on. My object was, in fact, chiefly to express doubt as to the one adopted. In my second letter I repeated my doubts, and described an experiment of Captain Abney's which appeared to be quite at variance with either formula.

This experiment I mentioned incidentally gave results quite in accordance with the "law of error," but I did not then advocate that formula, although I think it always deserves serious consideration, and only mentioned it in connexion with the question under discussion, viz., the relation between the amount of silver and transparency. Since that letter I have admittedly shifted my ground and introduced new matter, but still that has been to the point, as I have shown, by that means, why I now see reason to believe that the formula, $T=\epsilon^{-x}$, has, after all, been correctly made use of. On the whole, I think there has been very little to complain of in this respect. I ought, perhaps, to have noticed Messrs. Hurter & Driffield's kind offer to test any plates I could send them which I thought likely to give different results from those calculated by their formula, but I took it as a standing offer of which I might avail myself at any future time, although I scarcely expected to be able to do so, as I was not willing to trouble them unless I considered that there was a definite prospect of settling some doubtful point in that manner. The remark that I had "not *again* mentioned the subject" may, however, have led some readers into the mistaken impression that I had undertaken to supply such plates.

Messrs. Hurter & Driffield's explanation as to the true meaning of dx does not, I think, remove all possible objections to the reasoning on which the "correct formula" is based. They will probably admit, as I believe it is the opinion of most previous experimenters, that the visible (more or less) grain must be considered as a whole, and that, however some of the molecules in it may be affected by the action of

light, it will not be developable till it has received a certain amount of exposure, after which *all* the Ag Br contained in it will be reduced on development. If that be true, there must always be in an exposed plate a certain amount of unchanged Ag Br which has absorbed energy, but which will contribute nothing to the density of the developed image, and the energy so wasted does not appear to be in any way accounted for in the demonstration of the "correct formula." Another matter to be considered as a probable source of error is the fact, that in every emulsion there is, of course, always considerable variation in the sensitiveness of different particles of Ag Br, but the "correct formula" treats them as being all alike.

Messrs. Hurter & Driffield consider that my reasoning in attempting to show the superiority of the shorter formula, involves assumptions which are directly opposed to experimental facts, and complain that I do not supplement that reasoning by giving instances of experiments which support it. Not having conveniences for photometrical observations, I cannot do so at present in a very satisfactory manner, but I may surely be allowed to make use of the valuable material which Messrs. Hurter & Driffield have themselves supplied in the account of their investigations; and, if I can show that those experiments do not establish all that they are supposed to, I am perhaps offering useful criticism in pointing that out. In the absence of experimental proof that the simpler formula gives the more truthful account of the action of light in photography, Messrs. Hurter & Driffield decline to consider the reasoning which has led me to prefer it. Now, the experiments on which I rely are those described by themselves. In their original paper they mentioned that they had measured the densities, falling within the "period of correct exposure," in dozens of plates, and found them all conform to that formula. Now, however, it is explained, there is not a plate in the market to which it applies, except as a rough approximation; but, in opposition to that opinion, I will quote an experiment, viz., No. 21 in the paper on "Photo-chemical Investigations," which is perhaps the most important of the series. In the following table I give Messrs. Hurter & Driffield's observed densities—those calculated by them by the "correct formula" and the figures which would result by the shorter one if C = ·74 and γ = ·87.

Exposure C.M.S.	Density found.	Density calculated. "Correct" formula.	Density calculated. Short formula.	Exposure C.M.S.	Density found.	Density calculated. "Correct" formula.	Density calculated. Short formula.
10	·250	·339	·226	320	1·535	1·531	1·536
20	·460	·520	·488	640	1·885	1·780	1·797
40	·755	·743	·750	1280	2·088	2·022	2·059
80	1·010	·992	1·012	2560	2·262	2·218	2·321
160	1·270	1·272	1·274				

It will be seen that the results by the short formula are at least as accurate as those by the other. This table includes all the "period of correct exposure;" we know, of course, that it is only during that stage that it applies, and I have endeavoured to account for that fact in my last article. We have here two formulæ, each of which gives calculated densities nearly corresponding with those found by experiment, but only one can be theoretically true, and it seems fair matter for discussion to attempt to decide which is really the approximate formula, and which, if either, the correct one. I think most photographers will be glad to know that Messrs. Hurter & Driffield are continuing their valuable experiments, and it is to be hoped that one result of their future investigations may be to throw more light on theoretical photography; perhaps by clearly demonstrating the truth of the "correct formula," but possibly by discovering some still more satisfactory explanation of the photographic action of light.

H. J. Channon.

PROJECTIONS IN NATURAL COLOURS.

The visit of Mr. F. E. Ives to this country for the purpose of lecturing at the Royal Institution and demonstrating his method of reproducing natural colours upon the screen is attracting public attention to the possibilities of colour photography.

The writer has himself experimented during the past two summers in this direction, and his efforts were so successful that a British patent was completed, in order to cover his improvements upon earlier methods. It should be understood that Mr. Ives had worked in colour projection for years before this patent (No. 19402, November 20, 1890) was applied for, but his system was of so difficult a nature that little progress was made; and, in fact, Mr. Ives once stated, several years ago, that, after the most strenuous exertions, he had only succeeded in making *one* satisfactory set of three slides which, when displayed upon the screen, represented a landscape with natural colours.

Mr. Ives' system, at that time, was to make three negatives of each subject on three separate glasses, using certain colour screens to sift the light. These three negatives were printed from in the ordinary manner, so as to make *three* lantern slides on three separate glasses. Finally, three lanterns, with three limelights, were employed to project the three slides simultaneously upon the screen, with the aid of coloured glasses; so that, when accurately super-imposed, the desired composite image was obtained upon the screen.

The above paragraph represents the full amount of knowledge possessed by the writer when he first took up the subject. Starting with red, yellow, and blue as the primary colours, he soon found that it was not possible to reproduce colours correctly with them; and eventually he adopted red, green, blue, and violet as his primaries. With these, all colours could be reproduced; but, in working from nature, there is usually so little difference between the blue and violet sections that it is doubtful whether it is not better to combine the two sections into one, blue-violet. Thus, working independently, it will be seen that the writer has proved that the three primary colours, red, green, and blue-violet, which Mr. Ives was then, and is still, using, are practically the best.

The improvements which the writer made in Ives' process were as follows:—Instead of producing the negatives on three separate glasses, they were put upon a *single* glass by a special camera, furnished with colour screen; and thus, instead of three negatives to be developed, there was only one compound negative. Further, the three positives were also put upon one glass, by the simple device of printing by contact from the compound negative. It will thus be seen that, instead of using a minimum number of six plates to produce one set of positives, the same result was effected with *two* sensitive plates, one for the three negatives, and one for the three positives. Further, again, the three positives on the one glass were not separated, but were put as a whole into a small special lantern with *one* limelight; thus the difficulty of maintaining three separate limelights of equal power in a large triple lantern was overcome. The special lantern differed from the ordinary lantern chiefly in that it had several object lenses, or their equivalent, instead of one.

The above improvements were duly patented, and were first published in detail in The British Journal of Photography of January 9, 1891. A public demonstration of about twenty pictures made by this process was also given on May 14 of the same year before the Manchester Photographic Society, which was considered very successful. The *Manchester Guardian* of May 16, after describing the apparatus, stated:—

"The subjects shown were varied in character, including landscapes, sunsets, shop windows, and advertising hoardings. The skies, with light, fleecy clouds in broad daylight, or heavy masses of brilliant colour in the sunrises, were beautifully shown, and the coloured posting bills on a hoarding, as affording a means of analysing the effect of each colour screen, were even more interesting than the landscapes or the more important subjects."

Similar reports were given in many other papers, both British and American.

In June, 1891, six months after the publication of the writer's improvements, Mr. Ives gave a demonstration before the Franklin Institute of "some recent improvements he had made in the means of operating the process, by which it was rendered comparatively simple and reliable, and capable of immediately profitable commercial operation for lantern illustrations." The new arrangement included several features similar to the improvements for which the writer had obtained a British patent. In short, Mr. Ives now makes his three negatives on one glass; his three positives on one glass; and displays them by a special lantern with one light. It is this system which has helped Mr. Ives to produce the views, stated to be of great beauty, which he is now exhibiting in England.

The arrangement of the lenses in both camera and lantern can be varied in many ways without departing from the principle, and Mr. Ives has undoubted priority in several features of his system, such as the selection of the colour screens, the arrangement of a camera for taking three separate views of one object simultaneously from the same point of view, and an appliance called the helio-chromoscope for viewing the slides direct, without the aid of the lantern.

There can be little doubt that Ives' colour system will be further developed and improved in the near future, and that it will eventually assume an important position in lantern projection.

Albert W. Scott.

THE WARWICKSHIRE SURVEY.

The Exhibition of Photographs of the Survey of Warwickshire, now on view in the Municipal Art Gallery, Birmingham, is well worthy of a visit, and does great credit to the promoters of the object in view. On the 14th inst. was handed over to the city of Birmingham, through the Mayor, by the President of the Photographic Survey, J. B. Stone, Esq., about 1000 photographs in platinotype to be placed in the Free Library for reference at all times. These will form the nucleus for an ever-increasing collection of all that is interesting in the county, forming a reliable record for posterity of the buildings ancient and modern, monuments and manners, scenery and society, and other facts as they now exist. The Midland metropolis may thank Mr. W. Jerome Harrrison for his unwearied advocacy at all times and in all places of a systematic "survey" being made, and especially for his repeated appeals to the Birmingham Photographic Society to undertake that of their own county. How far and how well they have already carried out his suggestions will be seen in a visit to the Art Gallery, where above 600 of the views sent in are shown.

Having been invited as a contributor of some of my Convention views to the collection, I attended the presentation, and had an opportunity of seeing the pictures. It is not to be expected that a collection got together for such a purpose as this could compete with an ordinary photographic exhibition, either in art, quality, or technique, yet a great number of the exhibits would rank high, even if judged by these standards; such, for instance, as the fine interiors of Castle Bromwich Hall and the ancient tomb in Seckington Church, by E. C. Middleton; the Offchurch and Compton Wingate's Views, by Longmore, Simpkins, and others; *Grimshaw House*, by S. G. Mason; two sweet little cottage scenes at Hampton Lucy, and a View of Arbury Hall, by J. H. Pickard; the Baddesley Clinton Views, by Harold Baker and others; some capital work by E. H. Jacques and several others whose names I forget and cannot supply from the catalogue, which is good in every other respect, being well printed, and consisting of eighty-four pages of excellent matter, both historical and descriptive; but the names of the photographers are not given, neither can I remember a tithe of the views worth naming, for there is a delightful jumble of old fonts, church porches, tombs, castles, halls, cottages, rivers, and lanes, which form an ever-shifting scene in one's memory. Most of the views are on half and whole-plates, a few quarter-plates and about a score, presented by the President, 17 × 13 size, taken on wet plates in 1868. The day was finished by a garden party at Mr. Stone's, at Erdington, where a large photographic group was taken, and, in the evening, a dinner at the Colonnade Hotel.

Not being satisfied with photographs alone, I stayed a few days with a friend in "woody Warwickshire," some eight or ten miles from Birmingham, and enjoyed, as much as I could without my camera, visiting some of the places around—Solihull, Knowle, Packwood, Lapworth, Hampton-in-Arden, Henley-in-Arden, Berkswell, and places whose names I cannot recall. We had delightful drives along the lovely lanes, tree-shaded, with grassy borders and flower-besprinkled banks on either side, where bloomed amid the tangle and tufts of grass many a sweet primrose and purple hyacinth, with patches of red lychnis and the star-like flowers of stitchwort; past many a picturesque half-timbered farm-house and cottage, with blossoming orchards and gardens; under bending boughs of graceful trees, in all the fresh beauty of their varied spring attire; over bridges, giving glimpses of water-meadows, fringed with elder and willow—pictures everywhere! not to mention the old churches we visited.

Truly, the Birmingham Photographic Society has undertaken an herculean, if a pleasant, task. Even in the small section of the county we traversed there is plenty to be done. Take Berkswell, for instance; leave out the Holl, if you like, and confine yourself to the village proper, all comprised in a few acres, where you could revel for a couple of days in getting pretty pictures. It is an old-world, out-of-the-way sort of "Sleepy Hollow," with a most interesting Norman church. You may be sure it *is* Norman, if you are not up in architecture, for the old woman who keeps the keys said it was "bordering on 800 years." Singularly enough, the same authority told us the parson's screw also "bordered on 800 —— pounds!" Near by is the well, from which this ancient place is named, with a wonderful supply of clear water. The village stocks stand perfect on a triangular patch of grass in the centre of the village, shadowed by ancient elms. Why there are *five* holes to accommodate five ankles I cannot tell, but suppose, if three delinquents were captured at one fell swoop, one of them would have to be content to rest one leg only in the oak! But these stocks, though in good working order, are never used now; they belong to the good old times, and recall Hogarth's pictures in Butler's *Hudibras*, and the pleasanter recollections of dear old Riccabocca in Bulwer's *My Novel*. There are thatched cottages you could not pass by with a camera, and a picturesque old inn with a sign showing the "Bear and Ragged Staff," the cognisance of the Earls of Leicester, and a ship's gun in the front garden taken at Kertch. We had some mutton chops at that inn, and found the landlord was a professional photographer. I expect Bank and other holidays bring lots of people here for a drive from Birmingham and Coventry, for "groups are taken," I suppose, in the stable-yard and pretty back garden. Thank goodness, the place was quiet enough during our visit, and not a soul to be seen, or a sound to be heard save the cawing of rooks and the droning hum of the school near the church. Ah, that church is a dream, a poem in architecture! I will not inflict on you any attempt at discipline, but cut short my rhapsody with recommending "where to go with the camera"—Warwickshire, supposing you are satisfied with sylvan scenery, pretty cottages, old churches, moated houses, and castles. You will find all these to your heart's content. I would further advise you to send unmounted copies in platinotype of such good negatives as you may secure to the indefatigable Secretary of the Photographic Survey of the County of Warwick, J. H. Pickard, 11, Priory-road, Edgbaston, Birmingham.

Richard Keene.

GELATINO-CHLORIDE-OF-SILVER PAPER: ITS MANIPULATION.

[North Middlesex Photographic Society.]

The title of my paper, as it appears upon our calendar, covers rather a wide field, and I will ask you to take what I have to say for the description of the process as I am in the habit of working it. I wish more particularly to address my remarks to beginners or to those of you, if such there be, who have not as yet done much with this particular material.

Before going into the method of working, I will briefly bring to your notice certain points connected with the history of the process, which may possibly be of interest to you, and will also mention what I consider its principal advantages.

Historical Notes and Principal Advantages.

In the year 1865 Mr. G. Wharton Simpson introduced a process of silver printing called the collodio-citro-chloride process, or Simpson-type, in which the sensitive salts were held in suspension by collodion, and from which very fine results were obtained, but owing to the favour which albumenised paper obtained, Mr. Simpson's process did not continue in very general use.

Captain Abney, in 1882, discovered and suggested the use of an emulsion of chloride of silver, citrate of silver, and gelatine for printing-out, and in 1885 the late Mr. J. B. Obernetter put upon the market his gelatine emulsion paper; Liesegang & Trapp manufactured the paper commercially in the following year, and the Blackfriars Sensitising Company introduced its manufacture into England in 1890, since which time the Ilford Company have taken up the production of printing-out paper, manufactured upon somewhat similar lines, and apparently at a considerable reduction in price. I cannot enter into the details of the manufacture of gelatino-chloride paper, but will merely say that the paper generally used has a prepared surface, and is known as baryta or chalk paper, such as is used for collotype, in which the surface is coated with an insoluble film of gelatine and barytes or other substance. The prepared paper is coated with an emulsion of gelatine and sensitive salts of silver, made much after the manner of the ordinary gelatino-bromide emulsion for plates, and applied by hand or machinery; the paper is then dried, and is ready for use. In this state we receive it, sometimes a little older than it might be. The particular advantages it possesses are, in the first place, its suitability for weak negatives. With negatives which are wanting in what is commonly called "pluck," far better results are obtainable with this than with ordinary silver paper. By the use of green glass in printing, even negatives of exceptional weakness may be made to yield quite good results upon those papers containing citrate of silver (Obernetter and aristotype are, I believe, of this description), the reason being that silver chloride and silver citrate, which enter into the composition of the emulsion, are differently affected by light—chloride of silver is principally sensitive to the ultra-violet rays, and citrate of silver to the blue rays and some distance into the green of the spectrum. Now, the citrate of silver, which is sensitive to the green rays, gives greater contrast to the resulting print than does the chloride; so, by stopping out all but the green rays, we obtain the greatest amount of contrast from the citro-chloride. There is another advantage of a similar description which citro-chloride presents, that of printing quicker in the winter-time, when the ultra-violet rays of the spectrum, to which chloride is most particularly sensitive, are very deficient. The rapidity of printing is very considerably greater at any time of the year than is the case with ordinary albumenised silver paper, like which it is particularly adapted to combination printing from two or more negatives, nothing being left to guess-work or unaided experience, as with platinotype or bromide, and, if kept dry, may remain a long time in the printing frame without apparent deterioration.

Range of Tone.

The range of tone obtainable at will is very considerable, and reds and warm browns, purples and blacks, may be obtained with certainty, pro-

vided always that the print is suitable. There is a photographic saying that the tone of a print is settled when it leaves the frame, which is, doubtless, true of most print-out processes requiring toning, but we have, I think, in this case, far greater range than with albumenised paper or other processes. The ease with which the surface of the paper can be manipulated is a particularly useful feature from an artistic point of view. We can, by roughening the surface to a certain extent, tone down the brilliancy of strong contrasts, and partly kill the painful detail and small flickering lights often so confusing in photographs, or accentuate the detail and piquancy by burnishing to almost any required degree; or, again, the surface may be left in its natural state, or just slightly dulled.

Conditions of Permanency.

Of all the qualities of a photographic printing paper, there is one which is, or ought to be, of more importance than any other, that is, the permanency of the result. We all know the unstable nature of the average silver print, and the yellow sickness which often robs it of its charms within a year or two of its production, and such of us as admire the advantages and beauties of a process which has held its own so long, in spite of inherent decay, should be glad to welcome a material of a similar kind of certainly higher capabilities, and containing the elements of vastly greater permanency. The reasons upon which the claim for greater permanency is based are these: That not only is the sensitive film composed of a definite silver compound emulsified in gelatine, whereas, in the albumenised silver paper, we have a very unstable compound, silver-albumenate, but the emulsion is spread upon a prepared surface, and is cut off from, and does not sink into, the texture of the paper. It is consequently washed with greater ease and efficiency, the disintegration of the paper and size consequent upon prolonged washing of silver prints being unquestionably a considerable factor in their destruction. It is, of course, necessary, if the most permanent results are to be obtained, that the prints should be thoroughly well fixed, the hypo effectually eliminated, and suitable boards and materials used for mounting. There are certain general rules relating to the various manipulations which must be closely attended to, or, without doubt, the results will be partial or complete failure. The ways and customs of ordinary silver printing must be put on one side, for the material is different and requires a different treatment. Care is to be exercised in handling the paper, especially when wet, as then the surface is very susceptible of injury. The hands and dishes must be clean, and the latter used always for the same purposes, whilst hypo must be carefully guarded against, as the faintest trace before or during toning will stain the prints. The storage of the paper requires careful attention, and it will then keep, for the most part, in good condition for a considerable time if the air, light, and damp are effectually excluded. The best way, I believe, to store it is under pressure. I have myself used Aristotype paper which has been kept several months, and stored for four or five weeks between printing and toning, without any appreciable sacrifice of its good qualities.

The papers to which my remarks refer are Obernetter, Aristotype, Celerotype, and Ilford, these being the only brands which I have used. Personally, I prefer the celerotype and aristotype for warm tones, and the remainder for purple or black. They all give a remarkable amount of detail, and are well packed up and sent out. The celerotype, however, does not seem to be so well selected as the other papers referred to; it has also a greater tendency to curl during the operations, but the paper is thicker, and stands more wear and tear.

Printing.

Prints are made by contact and exposure to daylight in the ordinary manner. Any negatives, excepting those of exceptional density, are suitable for the process, those of a weak character showing to proportionately greater advantage. The negative is prepared as usual for silver printing by any other process; but, above all things, if of any value, it should be varnished, or the free silver will quickly stain it beyond recognition, especially if any trace of damp be present. The silver stain may not show at the time, but I have seen it develop afterwards. Lengthened printing in the open air in winter time will bring a rich harvest of stains. In placing the paper in the frame it is always desirable to dust the negative and paper with a camel's-hair brush, as dust will leave white spots, and to have the back of the negative clean, a thick pad of blotting-paper or felt behind the paper is also very desirable. All possible care should be taken not to expose the paper to any but very dull or artificial light, as, by reason of its sensitiveness, it will rapidly become darkened. The same care must be exercised whilst examining the print, which should always be removed into a dull light before the frame is opened. Printing should never be carried out in direct sunlight, excepting with negatives of too great a density, and for any negative inclining to weakness a very subdued light will give the best result. One, two, or three thicknesses of tracing, or other translucent paper, pinned over the face of the frame will work wonders with thin negatives, especially where masking-out and printing-in of skies or other portions is resorted to. As regards the extent to which printing should be carried, it is, I think, generally desirable to continue exposure until the darkest parts become bronzed, though this may not be practicable with some negatives. The bronzing will be lost in toning and fixing, as will also a considerable amount of the depth of the print, and proper allowance (to be gained only by experience) must therefore be made for this.

Toning and Fixing.

If the toning and fixing are carried on in separate baths, greater reduction will occur than if a combined bath is used. The prints, if preserved from light and air, may be kept two or three weeks before toning, but if stored for much longer time the whites are apt to become dirty, and difficulty may be experienced. The toning or bringing of the prints to a more pleasing colour is one of the most important of the operations connected with the process, and is effected by a variety of substances, the principal being gold, uranium, or platinum in combination with other substances. It is impossible for me to wade through a list of the numerous baths recommended, for their name is legion, but will give the formulæ for a few with which my small experiments have been conducted. Speaking generally of toning, I have a strong leaning to the more rapid baths as being the most interesting to work with, something of the charm of development entering into the work as the prints visibly change colour. Daylight is undoubtedly better to tone by than artificial light, the latter requiring a considerable experience of results. The light, however, must be weak, and the prints given no unnecessary exposure to it. In all cases the tone of a print is to be judged by transmitted light, and not by reflected light, the appearance of the print in the toning bath being no sure guide to the tone when fixation is complete. For instance, Obernetter paper in a uranium toning bath will appear quite a dark purple-blue, but changes almost instantly to brown when placed in the hypo. The tone must consequently be judged by looking through the print at the source of light. The changes of colour made by prints in some of the toning baths is very striking, brilliant yellow, red, claret, purple, and blue often succeeding each other. Cleanliness cannot be too much insisted upon at all times, but more especially during the operation of toning, especially where separate toning and fixing baths are used simultaneously. In the instructions given with the aristotype paper, the printer is directed to use one hand only for the toning bath and the other only for the fixing, transferring the prints as toned from one hand to the other; and, if this method is carried out, the chances of stained prints are greatly reduced, the faintest trace of hypo from fingers or other sources being sufficient to discolour the print. The toning bath must, in nearly all cases, be preceded by a thorough removal of the soluble silver by washing in several changes of water for from ten to fifteen minutes, the prints being placed in the water face downwards, else a deposit is liable to form upon the face. The first washing water is seen to rapidly become discoloured. The first wash of water is best poured off as quickly as possible, as it has the effect of degrading the whites if allowed to remain in contact with the prints; in the after-washing, however, the water may remain unchanged for a longer time. Some toning baths will require the prints to have less preparatory washing, and I note that the instructions issued with the celerotype state that one good washing is sufficient, and that the paper contains no free silver.

Gold Toning.

Toning with gold may be roughly divided into two methods—the first where the toning and fixing baths are kept separate, and the second, where the toning and fixing are carried out in the same bath and at one operation. There is, I think, no doubt that the first method is the best and the most certain, and the chances of permanency much greater, but it involves a little more trouble. I may here draw attention to the defects of the combined baths. Probable want of permanency in the print owing to the exhaustion or partial exhaustion of the hypo, the bath continuing to tone but fixing imperfectly, the latter being, of course, the most important operation. Then, again, many combined baths have alum in their composition, and the mixture of this with hypo causes a deposit of sulphur and oxide of aluminium and the liberation of sulphurous acid, leading, in all probability, to fading and degraded prints. The alum is used to arrest the disintegration of the gelatine by the sulphocyanide, and to ensure the regularity of toning.

Formulæ.

Turning now to the gold bath—for after-fixation nearly any good bath may be used—that given with the aristotype paper I have always found to work well,—

A.

Water	2 ounces.
Chloride of gold	2 grains.

B.

Water	3 ounces.
Sulphocyanide of ammonium	30 grains.
Hypo	1 grain.

One part of A poured into one part of B, not the reverse. It is necessary to dilute this a little, say about one-third more water. The bath must not be used until the red precipitate is redissolved and quite colourless. If the hypo be omitted brown prints may be obtained. The bath recommended by Obernetter for his paper is good for purple tones and is as follows:—

A.

Sulphocyanide of ammonium	3 drachms.
Sodium hypo	5 grains.
Water to	20 ounces.

B.

Distilled water	3 ounces.
Gold chloride	15 grains.

Pour about two and a half ounces of B into A, and stir well while doing so until quite clear; then add three to six ounces of water. For reddish brown tones increase hypo to ten or fifteen grains. This bath may be kept and strengthened with gold as required. The bath recommended for Ilford paper is as good as any and very simple.

Water	16 ounces.
Sulphocyanide of ammonium	30 grains.
Chloride of gold	2 ,,

This bath should be kept for a day before using, and tones in five or six minutes, and the bath, when it refuses to tone, should be replenished with gold or filtered and used as a base for a new bath. A good bath for brown or sepia tones is—

1.

Water	50 ounces.
Sulphocyanide of ammonium	1 ounce.
Sat. sol. ammonium carbonate	15 to 20 drops.

2.

Water	20 ounces.
Gold chloride	1 grain.

It must not be used till quite clear. It works well with celerotype, but I have never been able to obtain satisfactory results upon Obernetter paper. For bluish-black tones, Liesegang's formula works well.

Water	25 ounces.
Sulphocyanide of ammonium	1 ounce.
Phosphate of soda	1 ,,

A few hours before toning, add to ten ounces of this solution a solution of five grains of chloride of gold in one ounce of water. After this bath has been used add some more of the gold solution; it can then be used again. And there are many other equally good baths given in the instructions issued with the various papers which it is not worth while entering upon in detail. J. C. S. MUMMERY.

(To be continued.)

BOSTON CAMERA CLUB JOINT EXHIBITION.

THE Committee having the conduct of the Fifth Annual Joint Exhibition of the New York, Philadelphia, and Boston Societies report that the Board of Judges have announced awards to the following British exhibitors:—Medals: Messrs. A. R. Dresser, Hamilton Emmons, Lyddell Sawyer (Newcastle), F. Dundas Todd (Edinburgh), Clement Williams (Halifax). Diplomas are awarded to, among others, Mr. C. Court Cole, of Oxford, Mr. I. W. Evans, of Wolverhampton, and Martin J. Harding, of Shrewsbury. We gather that the Exhibition, which was open from May 2 to 7, was a large and successful one, about 1300 pictures being shown, and the attendance on the fourth evening numbering 3000. We have received the Exhibition Catalogue, which is a sumptuous volume, enriched with several very fine photogravures and collotypes.

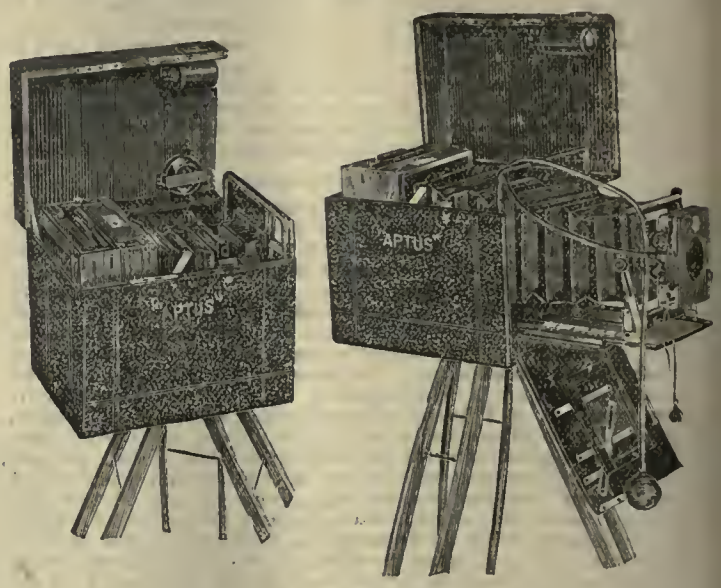
CHADWICK'S IMPROVED STEREOSCOPE.

SINCE we described the achromatic stereoscope of Mr. W. I. Chadwick, of Manchester, in last ALMANAC, its maker has considerably added to its efficiency in two respects. First, he has mounted the eyepieces on moving blocks, which, sliding horizontally, permit of such a separation of the lenses as enables the eyes to see, with stereoscopic effect, pictures that are badly trimmed and mounted in respect of being too wide apart. He has also, by means of two brass springs, provided easy means for the insertion and examination of slides, quite irrespective of the length of their mounts. These improvements render the stereoscope perfect.

THE APTUS UNIVERSAL HAND CAMERA.

THIS camera, manufactured by Messrs. Sharp & Hitchmough, Liverpool, and which has been exhibited at several London societies during the past week, enacts the *rôle* of both a hand camera and a focussing camera on a stand. When used in the former capacity, it appears as a compact leather case, having the usual perforation in front for lens and finder. The positions of the relative parts are shown in the cut, which represents it with the lid thrown open.

By releasing the front and allowing it to fall, the base-board is then capable of being drawn out, as shown in the following cut. It will be



seen that the body is capable of being distended to a considerable length, permitting the use of a lens of long focus. The various operations, such as setting and releasing the shutter, are performed from the bottom. It has, too, a swing back, and, taken altogether, it is well thought out and well made.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
May 30	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 30	Rossendale	Townsend-chambers, Rawtenstall.
,, 31	Lancaster	Storey Institute, Lancaster.
,, 31	Leith Amateur	
,, 31	Warrington	Museum, Bold-street, Warrington.
June 1	Edinburgh Photo. Society	Professional Hall, 20, George-street.
,, 1	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 1	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 1	Putney	High-street, Putney.
,, 1	Southsea	
,, 1	Wallasey	Egremont Institute, Egremont.
,, 1	West Surrey	St. Mark's Schools, Battersea-rise.
,, 2	Brixton and Clapham	Gresham Hall, Brixton.
,, 2	Leeds Photo. Society	Mechanics' Institute, Leeds.
,, 2	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 2	Oldham	The Lyceum, Union-st., Oldham.
,, 2	Tunbridge Wells	Mechanics' Inst., Tunbridge Wells.
,, 3	Bristol and West of England	Rooms, 28, Berkeley-sq, Bristol.
,, 3	Cardiff	
,, 3	Croydon Microscopical	Public Hall, George-street, Croydon
,, 3	Holborn	
,, 3	Leamington	Trinity Church Room, Morton-st.
,, 3	Maidstone	"The Palace," Maidstone.
,, 3	Richmond	Greyhound Hotel, Richmond.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

MAY 24,—Technical Meeting, Mr. Edgar Clifton in the chair.

THE NEW CONCENTRIC LENS.

A paper, dealing with the properties of the new concentric lens of Messrs. Ross & Co., was read by Mr. H. G. Heyburn. [This will appear in a future number.] At its conclusion Mr. Heyburn described Messrs. Ross's lens-testing apparatus, a *replica* of which was on view. This consists of a fixed watch dial on a plane surface, parallel to which, at a distance of several feet, is placed a holder for lenses of various sizes. Axial to the lens is a microscope on a stand, which is adjustable to the focus of the lens and capable of lateral movement, which thus permits of a lens being examined obliquely as well as centrally, the former being facilitated by a second and movable dial which may be placed at any desired position of obliquity. The bulb is in the form of a sphere, and thus the focal distance is the same for all angles of obliquity. No distortion is produced, no matter to what position the bulb may be turned.

At the conclusion of the paper, Mr. J. Stuart presented the Society with a copy of Dr. Schroeder's book entitled *Die Elemente der Photographischen Optik*, which was the standard work on optics in Germany. It had been criticised by men of learning in Germany, including Professor Abbé, who said that its only fault was its conciseness. Dr. Schroeder distinctly states that the majority of text-books in the hands of opticians were exceedingly defective, such books sometimes only dealing with portions that were simple, and forgetting oblique pencils, and other important conditions. The optics of photography were more complicated than the optics of the telescope, where only the central pencils were dealt with. In reply to Mr. Debenham, Mr. Stuart said that the statements made in the paper were Dr. Schroeder's, who was responsible for every word contained in it.

Mr. W. E. Debenham said there were several statements in the paper which he felt inclined to dispute very strongly. In the first place it had been stated that there was no distortion with the concentric lens, on account of the radii of curvature presenting parallel tangents from a certain position, which doubtless would be the position of the diaphragm. In that case there would be no distortion if the lens were used as a single lens.

Mr. Stuart said it gave absolutely straight lines as a single lens, the Gauss points being exactly in the centre.

Mr. Debenham said that the reason given accounted for the absence of distortion. As to "depth of focus," it had here, as he gathered, been claimed not for central rays, but for marginal rays. He had always maintained that there is no lens superior to any other in depth of focus.

Mr. Stuart pointed out that the concentric lens distributed the rays equally well all over the field.

Mr. Debenham could understand that it gave better definition at the margins; and therefore, starting from a fine point, they could move the focussing screen for a greater distance without reaching a certain amount of out-of-focus effect with a lens which defined well at the marginal focus. He did not call this depth of focus, but better marginal definition. And then, as to the concentric being quicker than other lenses in which the rays were not brought perfectly to focus, while here they were all brought to a point, this was equivalent to saying that a perfectly focussed view was quicker than one out of focus, but he did not find that pictures suffered from under-exposure in the unsharp parts. He thought this claim for extra rapidity a great mistake. In reference to two diagrams on the walls, illustrating Messrs. Rom's testing method by showing that objects on a plane surface were reproduced by the lens on a plane field without distortion, while objects on a concave surface were distorted on a plane field, Mr. Debenham said it was a great mistake to suppose that the objects at the side of the concave surface should be distorted. It would be the same with this lens as with any other, and the size of the marginal objects was merely due to the perspective of near objects. He regretted very much that these claims should be made in respect of such a very fine instrument as this lens, which, for definition and flatness of field, was a great additional power in the hands of a photographer. In all cases where rapidity greater than *f*-16 was not required, it seemed to him that the lens would be more useful than any other lens which preceded it, especially in cases where a widish angle was required. It was therefore more to his regret that these claims should have been made in connexion with such a splendid instrument.

Mr. Stuart could not at all agree with the remarks of Mr. Debenham as to the rapidity of the concentric not being more than that of any other lens of the same aperture and focus. It must be apparent that, if all the rays come to a point, the picture must have more intensity. There was another reason why the concentric lens must be more rapid. Unlike an ordinary lens, it had no secondary spectrum, the two glasses being extremely crystalline. By comparing a concentric with a symmetrical, the difference would be seen at once. As to colour not being detrimental to the rapidity of a lens, he had used glass for telescopes of sp. gr. 3·65, and had found one maker's glass take about 10 per cent. off the light more than another maker's. It was not so much in photographic lenses, but it was certainly something. He had dealt with the matter practically, and had had the lenses side by side with the same stop, when the concentric gave an intense image where other images were under-exposed, the difference in favour of the former being quite 25 per cent. He was quite willing to put the lenses to the test of using them stereoscopically. If he did not prove the statements that had been made with regard to the concentric lens, he would withdraw them.

Mr. Debenham said it was not fair to put it upon him that he suggested colour made no difference. The difference between the colour of the glass in the concentric lens and a rapid symmetrical was not great; the rapid symmetrical, as Mr. Stuart knew, had not got deep yellow or green glass. What was the total loss of light from the colour in a rapid symmetrical?

Mr. F. H. Wenham said that most photographic lenses showed colour, which was the result of under-correction; nevertheless, such lenses were actinically achromatic. One of the greatest difficulties in the construction of photographic lenses was the cure of colour.

Mr. Debenham said that was not the question. What was the amount of light which was intercepted by the colour of the lens? It was generally recognised that the loss by colour was small, more light being lost by reflection from the surfaces. With regard to the concentration of the rays making the lens more rapid, this meant that, if a building were put out of focus, it would destroy its rapidity; but he did not find it so. He wished to raise a protest against the assumption that a slight amount of spherical aberration leads to loss of rapidity, owing to the light not being brought to one plane.

Mr. Wenham stated that in an ordinary lens it did not follow in all cases that the oblique pencils were indistinct. If they took a sphere with lines passing through it, they would have a concave surface with the oblique rays equally distant, struck as a radius from the centre of the lens. Cut the sphere in half and the convexity is reduced one-half. What was the consequence? They would get astigmatism of the oblique pencils appearing, and be unable to get a distinct image of the marginal rays. When a concave meniscus passed a divergent ray through it, an opposite effect took place. The marginal pencils have a much greater degree of distinctness over a concave field, and the correction was much easier. Suppose, in order to secure a concave field, they altered the curves of the lens, the nearer they approached to flatness, the more perfect the oblique pencils would be. It was a peculiar property of this lens that it would give a concave field if exaggerated, but in the proper form it gave a perfectly flat field. In an ordinary lens they got distribution of coma at the marginal pencils, like two arcs crossed, in fact, an object at the margin being narrow and distorted. He had tested several of these lenses and found what he once thought was an optical impossibility—that is, that objects at the margin of the field retained their figure perfectly.

Mr. Debenham said Mr. Wenham had spoken of the lens possibly having a concave field. When a lens gives objects which are parallel to the focussing screen, and those near the focussing screen are also in focus on the screen, and so give a flat field for those objects, must it not have a concave field for distant objects?

Mr. Wenham said, No. Take another illustration—that of a rapid portrait lens. In taking a group, a photographer would not put the persons in a straight line; he would put them in a semicircle, and get an approximately flat field. There was no occasion to do that with the concentric lens. It gave a right line from a right line, whatever the distance might be.

In answer to a question of Mr. Swift's, Mr. Stuart said that the lens was valuable for copying purposes; but, of course, *f*-16 should not be used.

Mr. Debenham said it was undoubtedly the best lens for copying purposes.

Mr. W. G. Tottem, of Messrs. G. Houghton & Son, exhibited and explained the "Shuttle" Hand Camera of that firm.

Mr. Askew exhibited a portable lantern apparatus for oil lamp, the principal feature of which is the rapidity with which it may be unpacked and fixed in position, and a slide projected on the screen. On this occasion the operation lasted about five minutes. For reasons connected with the patenting of the lantern, we were asked to withhold any description of it.

Mr. W. G. Blackie, of the Blackfriars Sensitising Company, exhibited and explained the Anschütz Instantaneous Hand Camera.

Mr. H. B. Sharp, of Messrs. Sharp & Watmough, Liverpool, exhibited and described the "Aptus" Universal Camera. [See page 348.]

Votes of thanks to Mr. Stuart and the other gentlemen concluded the proceedings.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 19.—Mr. G. W. Austin in the chair.

Mr. R. R. Beard was elected a member.

Hand Cameras up to Date.

Mr. H. B. Sharp (of Messrs. Sharp & Hitchmough, Liverpool) exhibited and explained the "Aptus" Universal Hand Camera, which is capable of being employed either as a hand or stand camera at will. Mr. B. Foulks-Winks showed Messrs. Adams & Co.'s "Adams" Hand Camera, their new "Ideal," and the "Pocket" Hand Camera. The latter folds into a very small compass and has a swing back. Mr. J. A. Sinclair exhibited the "Hat" Camera of Messrs. Adams, which can be fitted to an ordinary felt hat.

A question from the box asked whether aluminium fittings to cameras would stand the effects of sea moisture. Mr. A. Mackie saw no reason why they should not, and also thought that aluminium could be lacquered as well as brass.

"How to Ascertain when the Fixation of a Silver Print is Complete."

The Hon. Secretary read Mr. Lyonel Clark's reply to the letter which he had written to that gentlemen, asking for information on this question. [See p. 343.]

Mr. Mackie said Mr. Lyonel Clark had not answered the question; he had not told them how to ascertain when the fixation was complete. This was an example of the careless way in which some examiners put questions. Mr. Clark did not seem to realise that they had asked him to answer his own question. How did he expect the candidates at the City and Guilds examination to answer a question which he (the examiner) himself could not answer?

Mr. P. Everett pointed out that Mr. Clark may have asked the question, well knowing that there was no answer to it and in order to ascertain the amount of knowledge among the students.

Mr. W. E. Debenham said that that would be a very unfair thing of a teacher, and he did not believe Mr. Clark would do that. The questions put should be such as to elicit the information the student had obtained from his own work under the teacher. He (Mr. Debenham) did not think the question was a catch. It was a thing which, in the present state of our knowledge, could not be known.

Mr. A. Cowan thought it was not fair to run down Mr. Clark, who had given them a fair answer. Mr. Clark did not know whether he had tried the bichromate test.

Mr. T. Bolas said bichromate had an effect on silver nitrate and not on the chloride, and therefore the examiner could scarcely have considered the question.

Mr. Everett said it was not an infrequent thing for mathematical questions that were incapable of solution to be asked.

Mr. Cowan hoped that the meeting would thank Mr. Clark for his communication although the question had not been satisfactorily answered.

Mr. A. Haddon concurred, and also suggested that Mr. Clark be asked what answer he would give full marks for if he set the question. Mr. Haddon said he should be glad to receive information on the point.

The thanks of the meeting were formally voted to Mr. Clark, and it was also decided to ask him for an answer to Mr. Haddon's question.

The remainder of the evening was passed in a lantern display, Messrs. W. P. Dando, G. W. Austin, S. J. Beckett, W. Bouts, J. S. Teape, and W. H. Harrison exhibiting slides. The latter gentleman showed a slide of Mr. Maskell's cat, photographed, presumably, by means of a flashlight. The facial expression of the animal created much amusement.

North London Photographic Society.—May 17, Mr. J. Douglas in the chair.—The evening was announced as a Technical Evening, and was commenced by the Fry Manufacturing Company showing the different forms of the "Griffiths" hand camera, which caused much interest. The principal subject for the evening was *Films*, and specimens were shown of the well-known Fry films. Messrs. Edwards had sent some samples of their films, and Mr. J. D. England also sent some specimens of film negatives and film carriers. The SECRETARY, in giving his experience of film working, stated that it had been practically confined to England's and Edwards' films, of both of which he spoke in high terms, showing negatives taken by himself which fully bore out his opinion. Up to half-plate there was no difficulty in using ordinary dark slides provided the thickness of the glass was made up for by a piece of dark cardboard. A film carrier made by the Secretary for hand-camera work was shown, and the various advantages of films were fully discussed. Next meeting, June 7, *Retouching*, by Mr. Redmond Barrett.

North Middlesex Photographic Society.—May 23, Mr. C. O. Gregory in the chair.—Mr. MUMMERY read a paper on *Gelatino-Chloride-of-silver Paper* [see page 346], showing examples on various brands of paper toned by different formulæ. He then gave a demonstration of the process, and answered questions on technical points. Competitions of views at the last three field days were then held. Votes of merit were awarded as follows:—"Edgware," Mr. S. E. Wall; "Chigwell," the Secretary; and "Chingford," Mr. S. Barnard. The winning prints will be exhibited on the walls of the meeting room for a few weeks, and finally preserved in the Society's album. A number of the first two issues of *Photographic Work* were distributed among the members. The next meeting will be held on Monday, June 13, when Mr. F. E. Jones will demonstrate the Plantinotype Company's new cold-bath process. Visitors welcome.

People's Palace Photographic Club.—May 20, Mr. C. W. Gamble (Vice-President) in the chair.—Question: Is a coloured stain on a negative proof that the plate is old? In reply: If, with normal development a stain in the form of iridescence appears round the edge of the plate, it may be taken that the plate is old, but a stain sometimes occurs with a comparatively new plate after very prolonged development. Work was shown by Messrs. Marriott, Walker, Cable, and Patten. Subject for the evening, *Developing Snap-shot Exposures*, which elicited a discussion. Mr. G. Patten was strongly in favour of dry pyro with ammonia, which he found gave an excellent printing negative, even if developed somewhat thin. For bare or under-exposures his formula would be half to one grain pyro, quarter of a grain bromide, six minims ·880 ammonia. This would be modified for different makes of plates. He found Paget 50 plates would stand forcing with a very large percentage of ammonia. Mr. T. LAWDAY said more detail could be obtained from under-exposures by giving the plate a bath of ammonia before developing. He preferred dry pyro for this class of work. Mr. R. BECKETT thought the next best developer to dry pyro and ammonia was a mixture of eikonogen and hydroquinone, which was extremely useful for a plate that could not be developed with ammonia. It was quick in its action. Mr. R. H. EDWARDS had lately used a mixture of rodinal and hydroquinone with good results. The rodinal, he said, had the effect of "flashing up" the image, and the hydroquinone gave density.

Kensington and Bayswater Photographic Society.—May 23, Mr. H. G. Hannaford in the chair.—Mr. G. BURSNELL read a paper and gave a demonstration on *Bromide Enlarging*. Mr. Bursnell showed how bromide enlarging may be done by either day or artificial light. In referring to the different developers he believed that the most satisfactory results were obtained by taking the developer recommended by the makers of the paper used. He made some satisfactory enlargements on the new rapid paper manufactured by the Eastman Company. Mr. Bursnell stated that where formerly he gave an exposure of one hour with this paper he now gave a few minutes only; this, of course, with a comparatively poor light. He recommended in all cases to make trial exposures, as there are so many factors which govern this important part of the work, the chief of these being the actinic power of light, the density of the negative, the presence or absence of stains, and the ratio of the stop.

Putney Photographic Society.—May 17, Annual General Meeting, Dr. W. J. Sheppard in the chair.—A satisfactory report was read and adopted. The HON. SECRETARY expressed his regret that he would be unable to continue the secretaryship, as he was leaving the neighbourhood. The following officers were then elected:—*President:* The Hon. Baron Pollock.—*Vice-Presidents:* Rev. L. Macdona and Dr. W. J. Sheppard.—*Council:* Dr. J. F. Farrar, Messrs. H. Faulkner, T. Gilbert, Chas. Ballard.—*Treasurer:* Mr. Wm. Martin, jun., 4, Lower Parkfields.—*Joint Hon. Secretaries:* Messrs. L. S. Zachariasen, Alfred Villa, Putney Bridge-road, and W. F. Gorin, 3, Montserrat-road.

South London Photographic Society.—May 16, the President (Mr. F. W. Edwards) in the chair. Mr. W. I. Chadwick, of Manchester, delivered a lecture on *Stereoscopic Photography*. The lecturer said the first thing to be understood was the reason why it was necessary to have two pictures to prevent complications and difficulties arising. He proceeded to explain this by remarks on monocular and binocular vision, illustrated by diagrams of the human eye on the blackboard, referring particularly to the difficulties of a person with one eye in judging the distance of various objects. A man with one eye could only do so by size, and it could easily be shown that in many instances his judgment could not be relied upon. A man with two eyes did not judge distance by size alone, but, by reason of the convergence of his eyes, saw objects solid, or, in other words, in relief. If two pictures were produced such as would be seen by each eye, and were viewed at the same angle, the objects depicted would be seen of the natural size, and with the same amount of relief. He then showed the diagram of a box which he had made some years ago, by which pictures taken with lenses of different foci appeared of the same size, and the person who viewed them would be unable to tell which picture was taken with the longer or shorter focus lens. After explaining the principle of the stereoscope, he showed the apparatus, which he used to produce negatives and transparencies. In making negatives it was necessary to have two lenses of equal focal length, and mounted on the lens board three inches apart. In making prints from the negatives the centres of the pictures were reduced to two and a half or two and five-eighths inches apart, a distance equal to that which the eyes are apart. The positions of the two pictures were also reversed after printing, the right-hand picture placed where the left was and the left-hand picture where the right was. When the various operations were successfully performed, and the two pictures viewed in the stereoscope, the objects depicted appeared as in nature, each standing out in advance of the others in their proper position. After an address of about one hour's duration a series of questions from an appreciative audience were asked, and lucidly and humorously answered by the lecturer.

Brixton and Clapham Camera Club.—May 17, Dr. Reynolds (President) in the chair.—Dr. T. CHARTERS WHITE gave a paper upon *Photo-micrography*. The lecturer said that the subject which he had chosen was a vast one, on account of the great strides made in photography during the last twenty years as applied to scientific research, inasmuch as photographs may be taken of an eclipse of the sun, of the entire heavens, or even of the smallest bacillus. In the first place, in carrying out his directions, no large outlay is required for apparatus, and any person who has a camera and a microscope can produce excellent results. Dr. White said he usually used an oblong lidless box placed on its side, the microscope and lamp is then placed inside this box, and a black curtain is pulled over its front, and shuts in the light, so that all operations could be performed in the same room. The box is firmly screwed on to a stout base-board, the middle length of which slides in and out by being dovetailed on the outer sides. At its distal extremity an ordinary printing frame is screwed as a carrier to hold the focussing screen and eventually the plate. These several parts must be accurately squared with the box and optical plane of the microscope, or the image will appear blurred. At the end of the box, next the carrier, an aperture is made to allow of the insertion of the microscope tube. The lamp is then lighted, and the object placed upon the stage of the microscope, and the image projected on to a glass plate in the carrier, which glass plate may have clean white paper upon it, and, the velvet carrier being pulled down, a brilliant image is thrown upon the focussing screen, and that part of the subject selected that it is desired to photograph, and thus roughly focussed. If a picture suitable for a lantern slide is required, the sliding base with its carrier is pushed closer to the box; and, if a more extensive amplification is wanted, the sliding base is drawn out. On removing the paper screen and inserting a piece of plate glass ruled in squares with a diamond, with the ruled glass next the microscope, the image may be viewed with an ordinary focussing glass by resting it against the glass plate and by bringing the aerial image of the object into exact focus with the fine lines, which would approximately occupy the plane of the gelatine emulsion on the sensitive plate. If the above details have been properly attended to, there is no reason why the photograph should not be absolutely sharp. The lecturer advised the following as approximate exposures:—When using 1½ objective, 3·45 seconds; ⅔ objective, 7·90 seconds; ⅓ objective, ½ 3 minutes; ¼ objective, 2·7 minutes; ⅛ objective, 4·10 minutes. Any developer which will give good contrasts is suitable. At the conclusion of the paper, an excellent set of microscopic slides were shown, which fully bore out all that Dr. White had said in his paper. A hearty vote of thanks was passed to him for his eminently instructive lecture.

Birmingham Photographic Society.—May 24.—The first whole-day excursion of the season was made to Buildwas Abbey and Much Wenlock Priory. Twenty-three members joined the excursion, under the leadership of Mr. William Jones; and 180 plates were exposed, chiefly whole-plate and larger. For the comfort of the party, a saloon was provided by the early express, and a delightful day was spent amongst the grand rivers of these exceptionally interesting places. For the information of photographers unacquainted with these historical ecclesiastical remains, it may be stated that Buildwas presents unique examples of the transition period from Late Norman to Early English. The extensive ruins of Wenlock Priory comprise beautiful examples both of Norman and Early English work of what was once the most important monastic establishment of the Midlands, and which are now carefully preserved by their present owner. An excellent luncheon was provided by Mrs. Butcher, of the "Raven Hotel," to which justice was done."

Tyneside Camera Club.—May 21.—There was a club outing to Marsden Rock and the coast. There was an excellent attendance of ladies and gentlemen. Plates were exposed on the famous Marsden Rock, Bottle Rocks, and numerous others. There was a strong west wind, which *was* a nuisance, and sundry sharp showers, which brought the waterproof focussing cloths into frequent use; notwithstanding the weather, a very pleasant day was spent.

Edinburgh Photographic Society.—The second of the members' Saturday afternoon rambles, which had been arranged for June 4, as stated in our report, page 318, has been altered as to date, all the other details remaining as stated. The date is now to be Saturday, May 28, at 2.10, Waverley Station.

Edinburgh University Photographic Club.—May 16, Dr. Drinkwater in the chair.—The first and principal business of the evening was the reading a paper and exposition on *Exposure Meters and Tables* by Mr. F. Dundas Todd, in which he set forth the factors determining exposure, such as the quality and state of the light for interior and exterior views, the lens, its focus and aperture, the plates in use, &c., and explained his comparative experiments with the various commercial "aids to timing exposure" in the market, describing the principle on which each of them was contrived. In the course of discussion which ensued, several of the members stated that they possessed exposure meters, but each of them admitted that they never used them save for the purpose of recording the exposure, as they had either found or believed the figures of the tables untrustworthy. Of the named meters three of the members had Watkins', and Mr. PEARCE stated that so far as he had used it with a single dozen of plates the results were fairly satisfactory, but he found his difficulty to be in deciding what subject number to take. Dr. PATERSON stated that he had now so accustomed himself to the use of a meter that he felt it would hardly be worth his while trying to photograph without it. Before using the meter he used to get about one good plate in a dozen, but now, with its use, they were nearly all good. Mr. HARRISON said that since he had become accustomed to the use of his meter he never had a wrongly exposed plate. Mr. TODD related a peculiar experience to him in platinum printing. For several days in the previous week he had been printing a set of platinum

prints, and, as a rule, had only two or three indifferently exposed, but one day, when the sky was quite clear, and a keen biting east wind was blowing, he had difficulty in deciding when the printing was complete, although he had taken the same care as on previous days, the result being that the batch of prints made on that day were practically worthless, all of them being under-printed. The CHAIRMAN (Dr. Drinkwater) said he was so sensible of the effect of this phenomenon that he always doubled his exposures during an east wind, and advised his audience to follow his example, which was that of the older photographers of the pre-gelatine period, the truth of it having even passed into a rhyming proverb. The Mr. F. Dundas Todd here mentioned has just been awarded one of the five out of twelve gold medals given at the present Boston, New York, and Philadelphia Photographic Exhibition, which have been adjudged to British subjects. His pictures were *The Smiddy*, exhibited at the Edinburgh Society's members' exposition, and *Baiting the Lines*. He is the only Scotchman among the five medal-getters, and this is the second gold medal for his works which he has obtained during the last few weeks.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

DEPTH OF FOCUS.

To the EDITOR.

SIR,—The discussion of yesterday evening at the Photographic Society of Great Britain has led me to believe that Mr. Debenham and myself could not agree in questions relating to photographic optics. I therefore consider that it would be unnecessary for me to "furnish two diagrams of lenses of the same focus" for his special consideration. This, after all, would perhaps not be admitted to elucidate the subject, which can best be decided by the usual optical tests, which are the most accurate and certain. The taking of pictures is seldom resorted to, and then only to show a practical effect.

I have referred to the pinhole stop as a fundamental example of infinite depth of focus. A photographer may try to take a landscape view with a perfect lens with large aperture, and fail for want of this depth of focus; this he at once obtains by the adaptation of a small stop.

If Mr. Debenham is prepared to discuss the subject of depth of focus, and the question of oblique pencils in photographic lenses, I refer him to the recent work of Dr. Schroeder, which is the only one that treats thoroughly of the optics of the subject. I am aware that he has access to the work. He will find the matter fully dealt with at pp. 148–152.—I am, yours, &c., F. H. WENHAM.

May 25, 1892.

PHOTOGRAPHY IN THE COLOURS OF NATURE.

To the EDITOR.

SIR,—From the reply of Mr. Ives (p. 333) to my letter (p. 318) I learn that Mr. Ives continues to make erroneous statements in order to defend the original errors which I have contradicted.

Mr. Ives asserts that the Franklin Institute gave me a *full hearing* before deciding the question of originality of orthochromatic photography in favour of him.

I reply that I have never received any official letter from the Franklin Institute in those terms. I only got from Professor Himes, of Philadelphia, a very friendly private letter, asking for several dates and details of my invention, which, in Himes' own words, "is only second to Daguerre's."

But it seems that Mr. Ives himself does not trust the verdict of the Franklin Institute, for several years afterwards he recognised the invention of orthochromatic photography as mine in your JOURNAL, 1891, p. 101.

In reply to Mr. Ives' assertion that "after Mr. Bothamley's translation I gave *five* as the minimum number of negatives and prints" I use, I request Mr. Ives to read my original paper of 1885 (mentioned on p. 318 of this JOURNAL), wherein I said not a word about "five negatives as a minimum."

The method of working with three negatives, claimed by Mr. Ives, is an old one, tried before mine by Cros, Ducos du Hauron, and Albert.

If Mr. Ives says "nothing was heard about his (my) trying to do it with three negatives until after I (Ives) proved," &c., I reply that, after Ducos du Hauron's publication (printed *twelve* years before Ives'), everybody could make coloured prints, with so-called complementary colours, without waiting for Ives' paper; even more, as in Ives' patent for 1890 not a word is said about coloured *prints*, but only about coloured lantern pictures, whilst in the same year I already exhibited *prints* in natural colours, worked out after my principle, which were exhibited in Berlin.

I agree with the *Standard* of May 10, "that the pictures are not colour-photographs in the popular sense of the term, but rather a combination of chromo-photography with optical illusion; and such is never likely, in its present state at least, to advance beyond the state of being a pretty experiment."

With regard to the so-called "complementary colours," I have developed my opinions over doubtfulness not only in my book on *Colour-sensitive Photography*, 1885, p. 137, but also in two lectures before the Society of Berlin Physicists (President, Helmholtz), *vide* report of the mentioned Society, April 20, 1888, and January 10, 1890, and I show it every year by experiments in my lectures on *The Theory of Colours* at the Royal Technical High School, Berlin. Perhaps Professor S. Thompson had never read those papers. DR. H. W. VOGEL.

Berlin, May 21, 1892.

STAINS ON PRINTING-OUT PAPER.

To the EDITOR.

SIR,—May we be allowed to explain one or two points in your correspondent's letter, which may otherwise be misleading?

1. We did not advise more gold than that on formula; we wrote that the gold in Mr. Meigh's bath was evidently almost exhausted, as proved by slowness of toning.

2. The pieces of paper were not signed, but only initialled, and it was impossible for us to decipher the initials and trace from whom they came until we saw Mr. Meigh's letter in your columns.

3. The pieces of paper referred to have been sent to Mr. Meigh to-day. They were printed and toned the day they reached us, and are perfectly free from markings.

4. We therefore adhere to our statement, that the markings are due to the cause we suggested.

We apologise to Mr. Meigh for the accidental separation of his letter and the pieces of unprinted paper, and feel sure he will allow us to make this public statement of the position of affairs.—We are, yours, &c.,

THE BRITANNIA WORKS CO., LIMITED.

Ilford, London, May 20th, 1892.

RECRYSTALLISED SILVER NITRATE AND "COSMOS."

To the EDITOR.

SIR,—I would suggest that the increased sensitiveness of bromo-iodide gelatine emulsion, made with fused nitrate of silver, as noted by Mr. Barker, is due to the fact of the fused nitrate being alkaline, and containing a small proportion of nitrite of silver. The accelerating powers of the nitrites were pointed out as far back as 1855 by the Abbé Laborde and Mr. Hadow nearly simultaneously.

Those of your readers who do not know the difference between ordinary nitrate of silver and the recrystallised salt will find it explained in the fifth, and probably later editions, of Hardwich's *Photographic Chemistry*. The recrystallised is not so attractive in appearance as the ordinary salt, being in less transparent crystals, probably from being dried by heat, but, which is the matter of importance, is free from organic impurities and from acidity; and, as old collodion workers know, it made a much more satisfactory bath. During thirty years' experience as a photographic chemist, I sold many thousand ounces of both kinds, and believe that the books of the chief refiners would show that the genuine recrystallised article was largely used during the last fifteen to twenty years of collodion being in vogue. I think that "Cosmos" is mistaken in supposing that many dealers acted as dishonestly as his sharp-practising principals.—I am, yours, &c., HENRY WHITFIELD.

May 23, 1892.

PHOTOGRAPHIC PRINTERS.

To the EDITOR.

SIR,—As an old reader of your valuable JOURNAL, I take the liberty of addressing a few lines to you. I am a photographic printer with about twenty years' experience, and about five months ago I had the misfortune to be thrown out of employment, through no fault of my own; and ever since I have been advertising and answering advertisements in the columns of your JOURNAL, and, up to now, have not been successful in obtaining a situation to suit me. I obtained one, but was only there a short time, as the gentleman said I was too old, and that he wanted a young man. I might mention that my age is thirty-nine. Surely a man is not too old at that age?

Now, what I should like to ask you, Mr. Editor, is whether photography is in such a bad state that a respectable man cannot get a situation, or is the market overstocked with printers, or is there any other means of obtaining a situation otherwise than through the columns of your JOURNAL. I never had such a difficulty a few years back, say, ten or twelve years back. For the last nine years I have been employed by one firm as carbon printer, so you may judge by that I have a good character. I have been asking 30*s.* for carbon, and 25*s.* a week for silver printing; is that a reasonable salary?—I am, yours, &c., UNFORTUNATE.

[Thirty-nine is by no means an age at which a man might be considered as too old for a photographic printer, or, indeed, for any other ordinary occupation. The wages our correspondent asks are extremely reasonable, but photographic printing has of late been reduced to such a degree of ease and simplicity that we fear the market is overrun with printers—good, bad, and indifferent.—ED.]

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

F. E. S. B.—Castile soap may be dissolved in plain alcohol.

E. SCAMELL.—In America the slides are placed "landscape way."

P. M.—If the bitumen will not dissolve in turpentine, it is useless for photographic purposes.

S. O. L. D.—Your letter cannot be inserted unless with your full name and address appended.

D. MACBETH asks for the address where he can obtain some of Monckhoven's pigmented (gelatine) tissues or films.—We believe such are not now obtainable commercially.

S. W. E.—For a small camera canvas cases are quite equal to leather, while they are both lighter and cheaper. For larger sizes leather cases are to be preferred, as they offer a better protection to their contents.

APPRENTICE.—For ordinary purposes, for testing the strength of the sensitising bath for paper, the argentometer is sufficiently accurate in practice. For theoretical accuracy the volumetric method must be employed.

N. SMITH is learning photography, and, having a good deal of spare time, wishes to learn lantern-slide making and colouring, and would like to know of a work on the subject.—Do any of our readers know of such a work?

A. HORTON.—We cannot discover the maker of the lens from the monogram, which is apparently that of some firm for whom it has been made. If we can get it interpreted we will intimate the same through this column.

R. A. C.—You are under a misapprehension. The original South London Photographic Society, like the North London Photographic Association, ceased to exist many years ago. Societies under the same or similar names are quite new ones.

WARDEN.—You cannot possibly prevent a photographer from taking views of the outside of the church from any point he chooses, provided he is not trespassing on your private property. You, the rector, or even the bishop himself, have no copyright in the building.

A. L. (Bedford).—If the stock solution of pyrogallic acid becomes slightly discoloured when first mixed and yet works well after several weeks keeping there is not much the matter with it. Don't trouble yourself about a trifling discolouration so long as the solution works all right.

C. A. GILES writes to know how to make a good varnish that will not stick when the negative is printed in the sun.—If our correspondent will refer to the ALMANAC for the current and past years, he will find several formulæ, which include the best that have been published.

Z. Y. X. (Leeds).—The cause of the starch not sticking must be that it is not properly made. Probably it is too thin; make it as thick as possible. Then, when it is cold, beat it up with a spoon, and apply it either with a tolerably stiff brush or a sponge. The latter is preferable for large sizes.

N. M. L.—Hunt's works are now all out of print—so also is Bigelow's *Album*—and have been for many years. The former may sometimes be met with at second-hand bookstalls. But your best way of obtaining copies of any of these works is to advertise your requirements in the columns devoted to advertising purposes.

H. WHITEFORD.—An ordinary Albion printing press will do quite well for collotype printing. Indeed, this form of press is still used by some of the best workers. In your initial experiments we should not advise you to go to the expense of a regular collotype press, as you already possess one that will answer every purpose.

A. TILLEY.—It is quite a mistake to surmise that, because a camera is very light, as well as portable, it will not be steady when set up in the field. But it must be kept in mind that this most essential quality—rigidity—can only be obtained by good workmanship and with good material, things that cannot be expected in low-priced apparatus.

EXPOSURE says: "Will you inform me the principle of Watkins' Exposure Meter, and the working of same, and how the correct exposure is obtained for various subjects, and stops used?"—Such information is, we believe, sent out with each exposure meter, but probably the makers will be happy to supply you with a pamphlet on the subject.

COPYRIGHT asks: "Who has the legal right to the copyright in a group in which there is a large number of figures? Can I copy and reproduce any single figure in the said group, and can the relatives of that person (deceased) restrain me from selling a copy or exhibiting it?"—Perhaps some legal reader can supply an answer to our correspondent's questions.

BLACKENING ZINC.—A correspondent, whose name we have lost, recently inquired concerning the blackening of zinc. We have since then obtained the following information. To stain zinc black, immerse in a solution of nitrate of iron, five drachms to the pint of water; or in a solution of protochloride of tin, one drachm to one pint. The zinc must previously have been made quite clean.

L. S. D. says he has a quantity of old frames of what is known as German gold, which have become almost black. He wishes to know if they can be regilt.—These frames, if they be, as we surmise, of the usual German moulding, are simply covered with silver foil and lacquered; then the most economical way of dealing with them is to use them for lighting the fire with, and getting new frames made, utilising the old glasses and backboards.

T. MOLLOY.—If the emulsion, the formula for which you obtained from the 1885 ALMANAC, does not give you sufficient sensitiveness, increase the time of cooking, say, fifty per cent., or even a hundred per cent. if necessary. Fog is the only limit to the time of cooking with a good emulsion.

FERROUS says: "Can you kindly inform me what is the most suitable paper for giving black lines on white ground? I have a formula that gives very good lines, but cannot get the white ground all over; have tried numerous samples—albumenised gave the best, but in this case the albumen dissolved in sensitising, and gave a smeared ground."—If our correspondent desires to have prints from line negatives, and these are dense and clear enough, the simplest plan would be for him to use either bromide or platinotype paper.

H. W. B.—The interposition of a plate of even optically worked glass will alter a focus made previous to such interposition. Hence it will be advisable to focus after the screen is inserted. Try this experiment: Take a small telescope and focus sharply an outside object through a plate-glass pane. Then raise the window, and it will be found that the object is now less sharp, and requires refocussing. Something analogous to this occurs with the microscope as regards the adjustment for the covering glass of the object.

DAGUERREOTYPE says: "I should esteem it a favour if you would inform me the best treatment for a Daguerreotype which a customer of mine removed from its frame and proceeded to dust with a handkerchief, with the apparent result of removing portions of the image. The surface was not tarnished, but simply dusty, and the amount of friction applied was very slight."—We fear there is no practicable way of restoring the spoilt image. For the best method of copying and reproducing it, see leading article in the JOURNAL a few weeks ago.

A. H. asks: "Which is the best style and colour of blinds for the roof and side of a studio? Should any of the glass be obscured or frosted? Would six feet be high enough at the side with an angle of sixty degrees for roof? Is "Darlot" a good lens maker? My studio is twenty feet long; would any whole-plate lens take a full-length cabinet in it?"—1. Dark blue spring blinds. 2. If there are buildings in the vicinity which would obstruct the light, frost the sides of the studio to a height of about seven feet. 3. Yes. 4. Yes, providing the lens is of not too great a length of focus.

MR. J. BUNCLE, of Edinburgh, sends us his catalogue. This is largely devoted to detailed particulars of many well-known types of cameras and other articles.

WEST LONDON PHOTOGRAPHIC SOCIETY.—May 28, Hampstead Heath, 3.30. Cycling division meet at headquarters 2.45, or "Askew Arms," Uxbridge-road, 3 p.m.

MR. W. F. STANLEY'S catalogue includes particulars of a large and varied collection of photographic apparatus, &c., for which there is a constant call among amateurs.

WE have received the catalogue of Mr. R. C. Murray, which contains particulars of photographic apparatus and materials, selected with Mr. Murray's well-known care and judgment.

PHOTOGRAPHIC CLUB.—June 1, *Photo-micrography*, Mr. T. Charters White. 8, *Dodging Negatives for Printing*. Outing, next Saturday, May 28, Merstham. Train from Cannon-street seventeen minutes past two.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—June 2, *The Telephotographic Lens*, Mr. T. R. Dallmeyer. 9, Members Open Night. 16, *Photogravure*, lecture by Mr. Howard Farmer. Visitors are welcome.

WE learn that rodinal, the new developing solution, with the powers of which we ourselves recently expressed ourselves pleased, is being largely used by many professional photographers. Messrs. R. W. Greeff & Co., the agents, have recently acquired the wholesale agency for Dr. Andresen's paramidophenol and eikonogen as well as of Dr. Byk's products.

FROM the catalogue of the Fry Manufacturing Company we learn of the approaching issue by this firm of a brand of plates specially designed to resist halation and give great latitude in exposure. Reductions are announced in the prices of Fry's bromide opals and celluloid films. The catalogue, which is a complete and comprehensive guide to the firm's specialities, has several specimen illustrations on papers of its own manufacture.

MESSRS. ADAMS & CO. write to solicit our help in trying to trace a thief or thieves who seem very successful in purloining lenses from them. They have, of late, missed quite a number, but unfortunately have no clue whereby to trace same. A few days back, however, a Wray lens, five-inch rapid rectilinear, with Waterhouse stops, was taken, and this lens bears the number of 4968. Messrs. Adams will reward any one giving information leading to the detection of the thief.

CONTENTS.

THE BRITISH
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PHOTOGRAPHIC PRINTERS.

The letter of a correspondent in our last issue, complaining of his inability to procure employment as a photographic printer, notwithstanding his possession of considerable practical experience, and, doubtless, the necessary qualifications added to most moderate expectations as to wages, has brought us one or two rejoinders, which appear to us to reflect with tolerable accuracy the views of those who are in a position to judge of the reasons why so many find this branch of photography unremunerative and otherwise unsatisfactory. Briefly expressed, the implication is that really good photographic printers are scarce, which, considered in conjunction with what we said last week as to the simplicity of making photographic prints nowadays being responsible for the dissemination of a great deal of mediocrity and sheer inability among photographic printers, undoubtedly conveys a good idea of the exact position of matters.

While pointing out, however, the simplicity and ease of modern photographic printing, we, of course, should not be understood to allege that the qualities in a man necessary for the production of good and uniform impressions from most kinds of negatives with which he has to deal are one whit less needful than in former times, or that, in fact, the inherent difficulties and peculiarities of each process have been any more than partially removed by recent improvements and advances. But, compared with negative-making, the production of paper positives of a sort, without regard to professional requirements, demands such small skill, that we can hardly be surprised that so many persons should seize upon photographic printing as an easy means of gaining a livelihood, with, as a rule, disastrous results to themselves, and, as we have already said, the effect of swelling the ranks of photographic printers with incompetents and duffers.

Would-be photographic printers are constantly submitting specimens of their work to us with a request for our opinion of it, coupled with what we should consider a fair salary to ask. In most cases these aspirants begin photography as amateurs, and, failing in their own employment, decide with a light heart to engage in photography professionally. Now and then, to be sure, a few really good prints—carefully printed from properly exposed, developed, and retouched negatives, and, so far as the particular specimens go, uniformly toned—are shown us, but such cases are quite the exception. Usually the specimens are from indifferent negatives, and of poor quality throughout, besides failing in the chief essentials of uniformity of depth and tone. Such people are too often persuaded of their own cleverness that it is a matter of difficulty to convince or prove to them that their work falls below professional standard, and a little advice to acquire greater proficiency does not always encounter a proper reception.

But, in addition to this class, unskilful printers are common enough in the ranks of those who have acted professionally as such for years. The fact is, a good printer is the product of a deal of practical study of the different branches of his subject. He must be a sound judge of the capacities, peculiarities, defects, and good points of each of the innumerable negatives that passes through his hands, which alone, from his standpoint at any rate, is equivalent to a small education in itself. He must be able to suit the process to the negative or the negative to the process at call; he should have the ability to convert faulty negatives into good printing ones. Each of the printed-out or developed methods (for example) of printing in platinum, carbon—silver in albumen, collodion, gelatine; of plain paper printing, with all the details and distinctive peculiarities and points of each process should be literally at his finger ends. The printing-in of clouds, masking, vignetting, combination printing, are also all necessary adjuncts which, in addition to an ability to produce good and uniform prints, and a complete acquaintance with the principle and practice of development, toning, fixing, and washing, all go to make up a good printer. We fear, however, that such a range of knowledge is not very prevalent among individuals, and that, indeed, the number of those who may fitly claim a perfect command over at least one process from beginning to end is not great.

When we come to reflect on the many qualifications which are demanded of a photographic printer—all of which we have by no means enumerated—there is no room for surprise that capable men are not so easily procured as professional photographers could desire. The more we ponder on the matter, and the more experience we have of it, the greater is our conviction that good printers are scarce, and, when obtainable, are assured of fair and adequate remuneration. And what, after all, is the cause of this scarcity? What, again, is the reason for the existence of such a very low average of skill and knowledge among the rank and file of photographic printers? The answer, we believe, rests on two facts. First, the growth and multiplication of new processes; and, second, the disinclination or neglect of young printers to make themselves thoroughly acquainted with the principles and practice of each of those processes as it is introduced. In most cases they are content with merely superficial knowledge, which, when put into practice, lands them into all sorts of difficulties, to the disgust of their employers and the degradation of their work. Study and practice, the experience to be gained from occasional failures, an unwearied application to even the minutest details are necessary to ensure successful printing from the negative. How often do we find these qualities, singly or in combination, in a photographic printer?

It is singular that at a time when, as we have often pointed out of late, printing processes are being very much improved and simplified, a decline in the skill of printers should be

remarked. Is photographic printing now so easy that printers should fall into the error of supposing that individual or specialistic ability is no longer necessary? Are all our modern negatives so good that particular treatment or attention to them is superfluous? Do not printing processes still require as hitherto to be minutely understood, and closely studied? We submit these questions with the conviction that, if they are answerable in any other manner than that which we suppose feasible, an additional clue will be found for the explanation of the falling average of ability among photographic printers of which complaint is made. In former times, when the number of printing processes in vogue was limited, photographic printing, judging by the numerous examples which have happily survived, was as a rule more carefully executed than now. Will the same be said of modern printing a few years hence?

DO NEGATIVES FADE?

With regard to this question we have recently been, by the kindness of a professional photographer, put in a position to make a thorough examination. "What man has done man can do" is a proverb which has not a universal application in our science, at least not in the way that it might be popularly expected to have. The conditions governing the production of certain results are too often so completely unknown that their reproduction is entirely fortuitous. But, when in one person's hands they are repeated indefinitely, it may be assumed that these may do what man has done; and, in the case in point, we will proceed to describe the latter.

We were allowed to examine negatives counted by the tens of thousands; they were on dry plates by almost every known maker, and let us state at the outset the result was thoroughly reassuring, so much so, as to enable us to give an emphatic negative to the question which forms the title of this article. We do not for one moment wish our readers to think that we have examined all these plates; that would be absurd. But it may be as well, *en passant*, to make a small calculation bearing on the matter. Suppose even twelve thousand negatives were examined, and only ten seconds given to each, the examination would last for four days of nine hours each, the work being done without cessation! What we have done is to dip here and there, beginning at the first dry-plate negative taken, and at intervals, without selection, take a negative and thoroughly inspect it. The result was that we did not meet with one single faded negative. But the owner of the plates informed us that there were a few damaged plates, and we inspected them closely. The result was that they might be placed in two classes—evidently imperfectly washed plates, and those where mercury had been used as an intensifier, there being finally a small residuum of unexplained causes. It was not the case that all the mercurially intensified films had proved unstable. Some were perfect though many years old, while others had turned into that "sere and yellow leaf" so familiar to those with long experience in this kind of intensification.

Lest the question of manner of storage may be supposed to affect the result, we may say that the particular examples we examined were stored in two entirely different modes, yet the result was the same—practically, complete exemption from any injury. Some were packed in the boxes originally used for holding the unused plates as issued by the maker, a piece of paper being placed between each to avoid scratches. Others were merely placed in racks upon shelves open to all atmospheric influences.

One point, however, deserves noting: every plate was varnished. Our photographic friend was most emphatic upon the desirability of this being done, that he said he would never think of printing from a negative of any value which had not first been varnished. In proof of the need for this, he selected for us, knowing where to find them easily, some beautiful plates quite ruined by stains. These, as he explained, were clearly the result of silver. One print had been taken from them before varnishing, and it was occasionally found that, whether through imperfect drying of the paper (very improbable) or from the frames or pads being damp, or perhaps the last trace of hygroscopic moisture not expelled from the film, a portion of the silver had set off from the paper on to the film, and gradually made its presence evident by a brown stain, increasing in intensity daily while printing was proceeding, till at last the plate became useless for good prints. We dwell fully upon this cause, as it is one that may probably be acting in a large number of cases throughout the country at the present time.

A further explanation was offered us as to the injury visible upon other negatives shown us. They were of larger size, and we were told that frequently it had happened that they had been washed under the tap by placing them on a levelling stand, and allowing the water to run on them for an hour or so. Most of the plates were washed in a tank with grooved supports, the water continually running in and out for about two hours, when the washing was considered complete, which, indeed, was proved in the results shown. It is an old story how difficult it is to wash out the soluble contents of the film, even with so porous a texture as wet collodion; far more so is it when a comparatively impermeable film like gelatine is employed. If any one will watch the effect of a stream of running water upon a film containing a coloured liquid, the experiment will be instructive, and show how curiously the liquid seems to cling to and remain upon the surface, though the flush of water be considerable.

We may conclude our remarks by quoting another proverb, "One swallow does not make a summer;" but the result of our examination, as explained, has been to prove that, if gelatine negatives be well washed, dried, and varnished, they may be considered as imperishable as, if not more than, collodion negatives; and the test of time has proved the latter to be completely stable.

New Gold Compounds.—M. P. Mercier recently read before the Photographic Club de Paris a brief paper setting forth a method of obtaining a number of new neutral salts of gold for employment in the toning bath. On account of this neutrality baths made with such compounds are said to have most excellent keeping properties. The compounds prepared by M. Mercier consist of auro-phosphates, auro-acetates, auro-succinates, &c., which are formed by neutralising gold chloride with an alkaline phosphate or acetate, as the case may be, in a small quantity of water, and crystallising the salt by evaporation. The only compound so prepared commercially as yet is the auro-phosphate of soda, which, by simple dissolution in water, yields a ready-made toning bath, which is said to give rich violet-black tones, either with albumen or emulsion papers.

Fluoréal.—The same gentleman (M. Mercier) has also incurred the serious responsibility of bringing out a new developer, which, however, appears to have some novel properties. It is called Fluoréal, the base being presumably para-amidophenol. The solution is coloured by the addition of fluorescein, which is said to prevent veiling of the plate during development.

Anhydrous Sulphite of Soda.—With fluoréal M. Mercier employs caustic lithea in conjunction with anhydrous sulphite of soda. The advantages of the anhydrous over the ordinary salt as a preservative are said to be that, thanks to its pulverulent form, it dissolves quickly; that, being free of any water of crystallisation, one part by weight is approximately equal to two of the ordinary salt; that it does not oxidise, and is therefore, unlike the common sulphite, not liable to conversion into sulphate, which is generally supposed to exercise a restraining action in development. M. Mercier states that he has exposed anhydrous sulphite of soda to the air for several months, and in analysis it only exhibited very faint traces of sulphate. The same gentleman speaks highly of caustic lithia as the alkali in preference to potash or soda hydrates.

Meteorological Photography.—In reference to Mr. Clayden's brief lecture on this subject the other night (see page 364), it may be useful to point out that the British Association some time ago appointed a Committee, consisting of Messrs. G. J. Symons, F.R.S. (Chairman); R. Meldola, F.R.S.; John Hopkinson, F.L.S., F.G.S.; and Arthur W. Clayden, M.A., F.G.S., F.C.S. (Secretary), to take the matter in hand. Photographs are desired of clouds, lightning, hoar-frost, remarkable hailstones, snow-wreaths, avalanches, glaciers, storm-waves, water-spouts, tornadoes, dust-whirls, halos, parhelia, or any other meteorological phenomena or their consequences. Prints, which may be mounted or unmounted, should be sent to Mr. Clayden, at Warleigh, Tulse Hill Park, London, S.W., who also supplies a leaflet giving brief instructions for taking cloud and lightning photographs, which all interested in the subject should possess.

Retouching.—Of the numerous subjects of interest (and otherwise) which are being constantly brought before photographic societies, that of retouching probably receives the smallest attention. This, perhaps, arises from two causes, which we may indicate as, severally, the paucity of individuals competent to discourse upon retouching, as well as to practise it; and the circumstance that amateur retouchers are few and far between, and that, therefore, the available number of persons willing, if able, to treat of it before a Society is small. So many amateurs nowadays attempt portraiture, that to them the opportunity of acquiring a knowledge, however limited, of how to improve their portrait negatives must be welcome. Such an opportunity will be given to the members of the North London Photographic Society on Tuesday night next, June 7, when Mr. Redmond Barrett is to introduce the subject of retouching, and will, we believe, accompany his discourse with several practical demonstrations of the use of the pencil. Mr. Barrett's mastery of his subject will surely attract a good attendance of members and visitors.

American Photographers in London.—During the past week we have been favoured with calls from quite a number of American photographers now in this country, foremost of whom is Miss Catherine Weed Barnes, of the *American Amateur Photographer*. Miss Barnes, as our readers are aware, is to attend the Convention and read a paper, and in addition hopes, during her stay, to visit many of the picturesque parts of the country with the camera. Mr. J. Carbutt, of Philadelphia, also called upon us the other day, and showed us the new "Genie" hand camera, a very clever little instrument, together with some remarkably fine prints from panoramic negatives, 18 × 48, taken on his films, as well as several smaller prints, 18 × 20, from negatives on his orthochromatic films. Señor Ferreira, of Rio Grande, a well-known Brazilian amateur, also waited upon us. Mr. F. E. Ives, of Philadelphia, whose paper on *Heliochromy* we reproduce elsewhere, informs us that he will not be able to attend the Convention. We believe he goes immediately to Switzerland, and thence back to America.

Mr. Lyonel Clark and the London and Provincial Photographic Association.—Elsewhere we print a letter from Mr. Lyonel Clark, pointing out that, when he was asked by the members of the London and Provincial Association to answer a question as to the method for ascertaining when the fixation of a silver print is complete, he was unaware that the question was addressed to him in the capacity of Examiner of the City and Guilds Institute. Mr. Clark was not the examiner on that occasion, and consequently did not set the question of the very existence of which he was ignorant. We are certain that the somewhat sharp and hasty criticisms which some of the members of the London and Provincial Photographic Association passed upon his communication will be regretted by nobody more than those gentlemen themselves. Mr. Clark is known to have given much attention to the theory and practice of silver printing, and to us, and possibly to him, it appears only natural that his views, on a point of importance arising therefrom, should be sought. It is unfortunate that an erroneous assumption should have been the means of crediting him with the authorship of the question which has given rise to misunderstanding on both sides, and we think that Mr. Clark should be the recipient of an explanation from the Association. Knowing the admirable manner in which the affairs of that body are administered by its excellent Secretary, Mr. Drage, we have no doubt that this has been done.

JOTTINGS.

A YOUTHFUL monthly contemporary having been asked by a correspondent to say what it thinks of the various photographic publications, falls into the old, old blunder of placing the BRITISH second to another weekly journal on the score of age. For his information, and that of others who may be lured into a similar mistake by the magnetic attraction of imitation, I beg to state that THE BRITISH JOURNAL OF PHOTOGRAPHY dates its birth from the year 1854, whereas the *other* only saw the light in September, 1858. True, its original title has been modified, and from a monthly it became in succession a fortnightly and a weekly, but these are no reasons why it should be persistently deprived of its claim to seniority. A man who changes his name and "keeps up" his birthday twice a year instead of once does not reckon his age from the date of those changes, but from the date of his birth. By the way, your juvenile contemporary dubs you the "watch dog!" The attributes most desirable in a watch dog are fidelity and reliability, so the compliment is a pretty one. But, when he goes on to satirise you for demolishing the numerous re-inventions which are constantly popping up in the photographic world to-day, he omits to acknowledge what I am sure everybody of proper feeling must own, and that is, that "THE BRITISH" renders an incalculable service to the photographic community in preventing those same re-inventions from being palmed off as new and original. If there were no BRITISH JOURNAL OF PHOTOGRAPHY just now, it would be necessary to invent one.

I am much obliged to Mr. Frederick Park, Mr. W. Cooper Edmonds, and "Old Silver Bath" for their comments on my last "Jottings." I agree with the first-named gentleman that *f*-32 is *practically* the same in all lenses, *i.e.*, 1/32 of their equivalent foci; but, as the foci of lenses employed for a quarter-plate, or indeed any other kind of work, are not constants, and cannot be guessed, "*f*-32" without the stated focus is only a piece of relative and not precise information. The point, however, is a very trifling one. As to density, with a rapid rectilinear lens and a large stop, being greater in the centre of a picture than at the sides, owing to the oblique rays being reduced in area by the lens mount, who thinks of employing the full aperture of a rectilinear lens for making negatives for enlarging?

"Old Silver Bath's" optimism is of that cheery order which entices its possessor into the habit of shutting one's eyes to facts. It is not only because I assisted my employers in cheating the public (I hope "Old Silver Bath" does not, after all, live in a glass house) that I hinted that recrystallised silver nitrate and the ordinary silver nitrate were often held by the vendors to be synonymous terms, but because I used to find that the average photographer was incapable of appreciating the difference between the two salts that, despite "Old Silver Bath's" chivalrous defence of "other and respectable dealers and makers of photographic chemicals," I must still stick to my original thesis. Assuming "Old Silver Bath" to be a genuine and not a

spurious veteran, I wonder how much nitrate of potash he has bought at the price of silver nitrate in his time? To say that he has "strong evidence" to the effect that a bath made with the recrystallised silver nitrate would keep in good working condition longer than one made with the commercial salt is a piece of intelligence only to be paralleled by the news that Holland has fallen into the hands of the Dutch.

Perhaps it is because I never attend the meetings of any of the Photographic Societies that a great deal of what I read as taking place at them only appeals to my sense of the ludicrous, and makes me wonder if those who speak thereat divest themselves of their common sense with their hats and overcoats. Here, for example, is Mr. Haddon, at a meeting of the London and Provincial Photographic Association, reported (I hope incorrectly) to recommend amateurs to go in for collodion positive work instead of gelatine negatives, in order, I suppose, to benefit—or, rather, not to injure—the professional. As well advise all city men to walk instead of riding to business, so that the boot and shoe industry might not become extinct. I should like to have a photograph of the high-souled new-style amateur in course of putting the Haddonian precept into practice; so, no doubt, would guileless Mr. Haddon. Assuredly the millennium would then be at hand.

If individual amateurs, or amateurs as a body, are ever desirous of lending a helping hand to the rank and file of professionals, who are undoubtedly the greatest sufferers through the vulgarisation of photography, it seems to me that they might easily do so by making a rule of not giving their friends prints of the portraits they may take of them, or of the views of their houses, and so forth. Let them make their friends a present of the negatives or duplicates of them, and tell them to take these to the professional to be printed. Thus the profession and the trade generally will be assisted, the friend would not miss the few pence charged for the prints, and the amateur will not only have spared himself the humiliation of having to give more or less bad prints, but will have the pleasure of knowing that, after all, he is a friend and not an enemy of the professional. Did not the late Mr. William Adcock, as large-hearted a man as you could find, once publish a similar suggestion in your pages?

I have said I never go to any of the Society's meetings. Though once an *habitué* of several, I placed myself on the permanent absentee list several years ago, because, being one who never took part in the discussions, it became, after a time, too great a strain upon my charity and endurance to sit under the deliverances of the same handful of clever persons week after week, and month after month, and to acquiesce in, by my silence, the severe snubbing which was regularly dealt out to younger, and therefore less informed, members who were guilty of the presumption of not always saying ditto to their seniors. Were I still a society man, nothing would so quickly convert me into a photographic Narcissus than the incident which occurred at the meeting where Mr. Haddon delivered himself of his remedy for languishing professionalism. The examiner at the last City and Guilds Institute is said to have asked the following question of his students, "How can you ascertain when the fixation of a silver print is complete?" What the answers given were I have no means of telling; but the question, somewhat unwarrantably, I think, is brought up to the meeting of a Society which has no connexion with the examiner or the examination, and the wise members thereof, being unable to answer, decided to ask the examiner to do so. Nobody has any right to assume that the examiner's question was not put in good faith, possibly in order to probe the ideas of the students on the point, and therefore the action of the London and Provincial Association in catechising him strikes me as uncalled for and undignified. Surely the members ought to know that catch questions are among the few means an examiner has at hand of flooring his mortal enemy, the crammer.

So, Mr. G. H. Slight thinks that any one having the photograph of a dead friend that had faded since his death might half naturally ascribe it (the fading since death) to some sort of sympathy with the death of the individual rather than to chemical changes. I can corroborate Mr. Slight's fellow-passenger in his discovery. I have noticed the photographs of dead people fade more rapidly than they did when the originals were living, chemical changes playing no part in the accelerated fugacity. But I have also occasionally noticed the same phenomenon occur with the photographs of living people, but not so often as with those that had died. The photographs were generally in albums, and the fading was due to the circumstance that they were frequently examined by sympathetic surviving relatives or friends in the best light available. "Proof of the correctness" of such changes is easily obtained, Mr. Slight. COSMOS.

THE CAMERA AND THE CONVENTION: OR PICTURESQUE SCOTLAND AND PHOTOGRAPHY.

V.

STRONACHLACHER is the name of the landing-place at the west end of Loch Katrine. We believe there has been a new hotel built at this spot since we were there. It is here that the Glasgow Corporation "put up" when on their waterworks inspection, the aqueduct by which the water of Loch Katrine is conveyed to Glasgow beginning near this place.

Down both sides of the loch from this upper reach many fine effects are to be procured, but by no means possessing charms equal to the Trossachs end of the lake.

INVERSNAID.

From this point the coach starts for Inversnaid, across Glen Arklet, a distance of four or five miles. This road is so hilly and hard upon the horses that it may be walked almost as quickly as driven. We have successfully walked the distance against the coach. Starting your walk immediately after leaving the steamer gives you the advantage over the coach by the time it takes to load and get away.

Inversnaid, that we now reach, is a boating station near the head of Loch Lomond. There is a good hotel here, and close by the side of it is a fine waterfall that descends from the promontory above into the loch. This waterfall is on the River Arklet, and certainly has been photographed many thousand times—it is so handy and so picturesque.

The late Mr. Ralston used to tell a good story about an old Highlander that he once met at these falls. Having got into conversation with him, Mr. Ralston offered the Gael a drop out of his flask, when the old Highland man, in a serious tone, remarked, "This is gran' water, sir. This water stands any quantity o' *whuskey*, sir."

Which he proved on the spot by returning the flask empty.

In the glen over the falls a good general view of Loch Lomond may be obtained.

Above Inversnaid, about a mile, is Rob Roy's Cave, and further on you reach the pier where you disembark for Inveranon Hotel.

BALLOCH.

Loch Lomond is too expansive for general views, and we have also found working from the Balloch end more convenient and more profuse in subject, using a small boat and going short distances, and the steamer when distances are beyond the reach of a small boat. The road up what is called the side of the Loch from Balloch is very disappointing, as the estates and private properties lie between the road and the Loch, and for miles, sometimes, you do not get near the water.

On one occasion we took the boat to Luss, with intent to walk to Balloch by road, which we had never done before. This was a distance of eight miles, and we fully expected to get any quantity of pictures by the way, and it really was very annoying, two-thirds of the way being between stone walls and such like, and the open parts of no moment. That day we met a photographic enthusiast on his bicycle, who had exposed his twelve plates on a flock of sheep, and was done with photography for the day.

Balloch is situated just where Loch Lomond runs into the Leven. At this place boats can be had at any time, and from the mouth of the river to either side of the Loch is but a short row, and as you creep along the shores the picturesque can be easily seen and noted, and landing at any desired place is in most cases easy. When staying here, we used to get many pictures that way, and found it both easy and enjoyable.

WATER EXCURSIONS.

These small boat excursions embrace the grounds of Balloch Castle, and on as far as Inch Murrin on the right, while on the left hand are

Cameron House, Auchendennan, Auchinheglish, and Arden, all estates quite near, and all worthy a visit.

Then come the trips by steamers. Luss is the first village on the way up the loch, and it is well situated for some good work, but the stopping places all the way up will repay the trouble of going to them.

Rowardennan is specially interesting. This is the starting-place for those intending to "do" Ben Lomond.

At the Glasgow Convention there was one trip on this loch which will be remembered with pleasure by many. It was under the leadership of Mr. John Stuart, the journey being up the loch to Tarbet, and across the hill to Arrochar on the Clyde.

From Balloch some enjoyable little trips can be had, notable amongst these are the grounds of Tillichewan, Mount Misery, Glen Finnich, a short glen but deep, precipitous and grand. And on the line to Glasgow, Dumbarton Castle.

Glasgow.

Then come we to Glasgow, the second city of the empire, which already has had its "innings" in the way of entertaining the Convention gathering, but probably a day will be given to the city of the west, as was done to our Edinburgh friends when the meeting was in Glasgow.

Glasgow, like all other commercial cities, looks, on the face of it, as if there was not much to photograph, but amidst all the hurry and bustle of a toiling, crowded city there is always something to be found and noted worthy of the picture taker.

The Cathedral stands first in point of importance and interest. The exterior possesses many points of pictorial interest which must be familiar to many whilst the interior of the church, with its Lady's Chapel and crypt, and stained-glass windows, supply material for a large series of pictures that would delight the heart of those who enjoy this class of work, and many enthusiasts take a great pleasure in it.

Next is the Necropolis, rising immediately behind the Cathedral. It is very imposing. It rises some three hundred feet, showing terrace on terrace cut out of the rocky hill, with monuments and trees and shrubs all blended in one harmonious whole, rendering the cemetery a striking picture of peace in the midst of its busy surroundings. The parks are of some photographic interest, especially the West End Park. It is unfortunate that at present one-half of it is torn up in the constructing of a district railway; but, still, down by the Kelvin it is fairly free from the obstruction, and on the other side of the river, where the Exhibition stood, the park will be found in very good condition, and it is along the banks of the Kelvin on this side that the best pictures of the University are to be got, with good reflection effects in the water and picturesque groupings of foliage. The Queen's Park, usually called the South Side Park, is close to the historical ground where the battle of Langside was fought, and many points of beauty are to be caught in this park and its surroundings.

East End Park.

The Alexandra, or East End Park, is not in a favourable position for picture taking, being in the immediate vicinity of iron works and other smoke-producing manufactories, which tend to keep it in a perpetual atmosphere of haze—besides, the park is still too young for the obtaining of good general effects. The quay on the river down by the Broomielaw, where the crowds of boats and people are coming and going all day long, will commend itself to many. The number of instantaneous pictures that have been taken here, both artistic and interesting, argues that such scenes of bustling life have a charm for many photographers. Busy streets and handsome buildings are to be found everywhere in this city of the West; but architectural street subjects are rather at a discount by our Convention friends unless they embrace old churches or monuments that possess an interest or story of their own—these also are to be found in Glasgow—but for the most part, in the tide of time, they have got crowded out of sight away in old streets and back ways, and, midst the constant hurry of a commercial life, get dropped out of memory and neglected.

As a centre for the photographer, Glasgow stands unrivalled for surroundings possessing beauties that appeal to every taste, whether river, or lake, or mountain, or flood. For a little outing there is Campsie Glen; not much of it, but what there is is very charming. Then, for a day, there is Hamilton Palace and Bothwell Castle. We believe that special permission must be had to get into Hamilton Palace and grounds, but they are well worth some little trouble in obtaining this. The ruins of Bothwell Castle are romantically situated close to the river Clyde, its ruined walls decorated by Nature with wild flowers and trailing plants. The surroundings are well suited for pleasing work, without much trouble in obtaining points of view, the Clyde here being very picturesque.

COMPOSITE HELIOCHROMY.

[Journal of the Society of Arts]

Most people look to original discovery for the solution of photographic problems, and most photographical problems are solved by original discovery. There have been a few important exceptions to the rule. The production of the so-called half-tone photographic block—the latest substitute for wood-engraving, now grown to a very important industry—is one example. The first practical solution of this problem—a process which I patented in America in 1881—was a purely mechanical invention utilising photographic processes already known. The so-called Woodbury-type process is another purely mechanical invention, based upon well-known photographic processes.

Collen's Process.

The method of colour photography, which I have named composite heliochromy, and which the French prefer to call photochromy or composite photochromy, is also an invention utilising comparatively old and well-known photographic processes. It is not a simple invention, but comprises several inventions by different men. The original suggestion was made twenty-seven years ago by Her Majesty the Queen's painting master, Henry Collen.* Briefly stated, Collen's idea was to make three negatives of an object, one by red light, one by yellow, one by blue—the so-called primary colours of Brewster—to print from each pair of these negatives (superposed as one) a transparent positive having the colour (in the shadows) of the light that produced the third negative, and to superpose these coloured positives on a white surface. A Baron Ransonnet, of Austria, is credited with the same suggestion in the same year, but I have not the reference.

It was not possible to carry out Collen's suggestion at that time because there was no known process by which photographic plates could be made sensitive to the separate single colours only; and no photographic plates were sensitive enough to red and yellow to admit of the production of such negatives by exposure through selective colour screens. Had it been possible to carry it out, the results must have been very imperfect, not only because the entire procedure is based upon a false and misleading theory of colour, but also because superposing two negatives to act as one would double the intensity of such parts as represented white, grey, or pale-coloured objects, with the result that, if the colour prints were made to show all the details of the negatives, the finished heliochromes would show all bright colours as if mixed with equal parts of black pigment.

Ducos Duhauron's Patent.

On November 23, 1868, Ducos Duhauron, of Paris, applied for a patent† for a process which differed from Collen's only in the manner of carrying out the same idea. Like Collen, he assumed that the spectrum is made up of three primary colour rays and mixtures thereof. He said, "My procedure rests on the principle that the simple colours are limited to three—the red, the yellow, and the blue—the combination of which, in divers proportions, produces the infinite variety of shades in nature." Like Collen, he expected to solve the problem by superposing red, yellow, and blue prints from negatives made by yellow and blue, red and blue, and yellow and red light. But, instead of using plates sensitive to simple colours only, he proposed to use plates sensitive to all colours, and to prevent the action of colour rays not wanted by filtering them out with coloured glasses placed in front of the sensitive plates; and, instead of superposing two negatives to act as one to make a colour print from, he proposed to make two colours (that is, two-thirds of the spectrum) act to produce each negative, which amounts to the same thing. He proposed to make one negative through an "orange" screen, calculated to absorb the blue light and transmit the red and yellow; one through a "violet" screen, calculated to absorb the yellow light and transmit the red and blue; one through a "green" screen, calculated to absorb the red light and transmit the yellow and blue.

It was no more possible to carry out this idea in Duhauron's way in 1868 than to carry it out in Collen's way in 1865, although Duhauron, having succeeded in making photographs by exposing ordinary photographic sensitive plates through glasses that were orange, green, and violet to the eye, imagined that he had succeeded in carrying it out. In reality, the photograph made through an "orange" screen must have been made chiefly by either the green, the yellow-green, or the ultra-violet spectrum rays, as can readily be proved by photographing the spectrum itself through a bright orange screen (not an orange-red one), on such a plate as he used. The photograph made through a "green" screen, the transmitted freely both the yellow and the blue rays, must have been made chiefly by the blue rays, and the photograph made through a

* The British Journal of Photography, October 27, 1865, p. 547.
† Class xviii., sec. 3, serial No. 83,061.

"violet" screen must have been made without any action by the red rays and with a great deal by the invisible ultra-violet rays.

Charles Cros' Modification.

Soon after Duhauron published the details of his process, Charles Cros, of Paris, published another modification of Collen's idea.* Like Collen, Cros proposed to make one negative by the action of red light, one by yellow, and one by blue; but by exposing the sensitive plates through red, yellow, and blue glasses, instead of employing plates sensitive to the single colours only. Instead of superposing the respective pairs of these negatives to make each colour print, he proposed to make a green print from the negative made by red light, a violet print from the negative made by yellow light, and an orange print from the negative made by blue light. Cros's plan was free from the defect of doubling intensity on those parts of the negatives representing pale or uncoloured objects; but the advantage gained in this way would be lost again in the production of green, violet, and orange-coloured prints.

The principle of colour selection advocated by Duhauron is identical with that distinctly proposed by Collen, to whom alone the credit of the original invention appears to belong; but Duhauron and Cros, besides proposing a more reasonable plan for obtaining the negatives, further suggested that optical superposition of positive images from the three negatives might be substituted for the superposition of transparent coloured prints.

On December 3, 1869, M. Poirée, of Paris, in a communication to the Photographic Society of France,† suggested that better results might be had by making a greater number of negatives—a separate negative for each spectrum region.

Dyed Silver Bromide.

In 1873 Dr. H. W. Vogel, of Berlin, discovered that bromide of silver can be made sensitive to the less refrangible spectrum rays by treatment with certain dyes; and this, with the subsequent discovery of other and better colour sensitisers, supplied the means for carrying out either Collen's or Poirée's idea. Duhauron, one of the first to avail himself of these discoveries, made some practical progress, and, in 1876, abandoned Brewster's colour theory, and patented a modified process,‡ based upon the observation that, while there appeared to be "seven" principal spectrum colours, three colouring substances would "serve to express them." The colouring substances he named for this purpose are blue, carmine, and yellow; and he decided that, in order to make such a process reproduce the colours of nature, the negatives should still be made through orange, green, and violet glasses.

Chlorophyl and Eosine Plates.

At this period Duhauron's orange-screen negatives were made on chlorophyl plates, and must have been made chiefly by the red spectrum rays. In 1878,§ he announced that he had substituted eosine for chlorophyl, so that he must finally have made them chiefly by the greenish yellow spectrum rays. The significance of this fact has not been generally recognised. The production of three negatives, one through an "orange screen, one through a "green" screen, and one through a "violet" screen, is a very indefinite procedure. A negative may be made through an "orange" screen chiefly by the action of red rays, or orange rays, or yellow rays, or yellow-green rays, or green rays, or ultra violet rays, according to the character and intensity of the "orange" colour of the screen and the method of sensitising the photographic plate for colour. Duhauron, who never recognised the necessity of testing his process by photographing the spectrum itself, not only did not find out what it is necessary to do in order accurately to reproduce the natural colours, but at different times he did very different and inconsistent things without himself knowing that he did so. The facts can very readily be demonstrated by first showing the spectrum absorption of various "orange," "green," and "violet" screens, and then photographs of the spectrum which have been made on plates differently sensitised for colour. I shall now proceed to demonstrate this point.

In 1879, Cros‖ also abandoned the idea that red, yellow, and blue are primary spectrum colours, but held that there are three primary spectrum colours and mixtures thereof, and that these primary colours are orange, green, and violet. Like Duhauron, he decided to make negatives through orange, green, and violet screens, and prints in blue, carmine, and yellow. Cros, like Duhauron, was apparently ignorant of the fact that very different negatives can be produced through one and the same screen, and he also allowed all of the invisible ultra-violet rays to act in producing the negative of the "violet" screen.

In 1885, Dr. H. W. Vogel* proposed to make the colour prints with dyes identical in spectrum absorption with the colour sensitisers employed in making the negatives. This does not amount to a principle of colour selection, because the entire spectrum can be photographed on plates sensitised with dyes that cannot be combined to reproduce some colours, and even without any dyes at all, by the use of suitable colour screens.

The Young-Helmholz Theory.

Some time previous to 1889, I do not know the exact date, the Young-Helmholz theory of colour vision was first recognised in connexion with this subject by Dr. F. Stolze, of Berlin.† He said, "Although the colours correspond with certain external processes in nature, there is also no doubt that colour as such is nothing objective, but a subjective sensation, based upon the peculiar irritation of the visual nerves by those external proceedings. We can, therefore, only hope to produce a picture in natural colours when we are enabled to reproduce upon the same the proceedings which furnish to us the colour impression." "Thomas Young . . . . assumes that there are three kinds of nerve fibres, sensible to red, green, and violet. Objective homogeneous light excites all three; but with red the first is excited strongly, the second and third weakly; with blue, the second and third moderately strong, the first weakly; with violet, finally, the third strongly, and the first and second weakly. If all three kinds of nerves are equally strongly excited, the impression of white light will take place." Dr. Stolze suggested, but rather indefinitely, a procedure which, although not really representing the application of this theory, was more nearly consistent with it than were any of the older ones. The theory itself was defective as a basis of procedure, Clerk Maxwell having shown that the fundamental red sensation is not at all excited by the blue-green, blue, and violet rays, the fundamental green sensation not at all by the red or violet rays, and the violet sensation not at all by the red, orange, or yellow rays.

Mr. Ives' Improvements.

It was at this stage that, after ten years of experiment along the same lines as Duhauron, Cros, and Stolze, I myself made certain improvements, and claimed the credit of bringing order out of chaos by devising a procedure which not only recognises the facts which support the modern colour theory, but which definitely represents the application of that theory.

This process, although in a general way somewhat similar to those which preceded it, really represents a distinctly new principle, which is that of making three photographs by the action of light rays as they excite the three fundamental colour sensations, and superposing these photographs by means of lights or in transparent pigments which suitably represent the corresponding fundamental colour sensations.

In February, 1888, I demonstrated, at the Franklin Institute, Philadelphia,‡ a process in which the colour selection was according to a definite plan, and proved by photographing the spectrum itself, adjusting the colour screens to obtain definite density curves in the spectrum negative. This was the first publication in which a really definite mode of procedure was indicated; but it was not until November of the same year§ that I demonstrated the method so modified as to definitely represent the application of the Young-Helmholtz colour theory, in accordance with Maxwell's measurements of the relative power of different spectrum rays to excite the respective fundamental colour sensations.

Maxwell's Diagram.

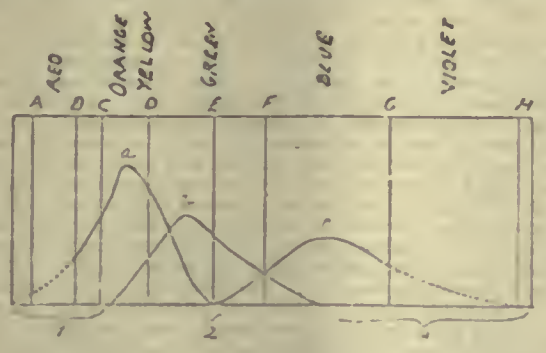
A little study of Maxwell's diagram, showing the result of his measurements, will show that the application of this new principle involves very important departures from the older methods of procedure. In this diagram, which I reproduce, 1, 2, 3 are spectrum colours which represent fundamental colour sensations, because each excites one sensation only, and *a*, *b*, c are curves showing the relative power of different spectrum rays to excite the respective fundamental colour sensations.

The first remarkable fact to be gathered from the study of this diagram is, that the rays which represent a fundamental colour sensation are in no case the ones that most powerfully excite that sensation. The red sensation is excited by all the spectrum rays from red to green, but most powerfully by the orange; and the negative to represent the effect upon the fundamental red sensation must therefore be made, not through a red glass, or by the red rays, but by the joint action (in definite pro-

* Described in *Photographic News*, October 8, 1869, p. 483.
† The British Journal of Photography, 1870, p. 26.
‡ British patent, July 22, 1876, No. 2973.
§ *Traité Pratique de Photographie des Couleurs*, Paris, 1878; *Photographic News*, 1871, p. 115.
‖ Bulletin of the French Photographic Society, 1879, p. 23.

* *Annalen der Physik* (N.S.), xxvii. p. 130; *Photographic News*, 1887, p. 568.
† *Anthony's Photographic Bulletin* (N.S.), 1888, pp. 516, 555, 588, 647, 678.
‡ *Journal of the Franklin Institute*, cxxv. 345.
§ *Ibid.*, Jan., 1889.

portions) of the red, orange, yellow, and yellow-green spectrum rays. The negative to represent the effect upon the green sensation must be made by the joint action of the orange, yellow, yellow-green, green, and green-blue spectrum rays, in proportion to their power to excite that sen-



sation. The negative to represent the effect upon the blue-violet sensation must be made by the joint action of the blue-green, blue, and violet spectrum rays, in proportion to their power to excite that sensation.

By photometric measurement of the density curve of a spectrum negative, the relative amount of action by the different spectrum rays may be found. It is, therefore, only necessary, in order to secure action by different rays in any definite proportions, to use such a combination of sensitive plate and colour screen as will yield a spectrum negative having a density curve corresponding to the graphic curve representing such proportionate action.

Sensitive Plates and Colour Screens.

Sensitive plates and colour screens that will yield three negative of the spectrum, having intensity curves like the three graphic curves in Maxwell's diagram, will produce a permanent photographic record of the effect of light from any object upon the three fundamental colour sensations. This can most readily be accomplished (with separate plates) by exposing a cyanine-stained rapid gelatine-bromide plate through a double screen of aniline yellow and chrysoidine orange, of suitable intensity, for the red sensation; a commercial "orthochromatic" plate through a screen of "brilliant" (aniline) yellow, of suitable intensity, for the green sensation; and an ordinary gelatine-bromide plate through a very thin piece of plane polished green glass for the blue-violet sensation. The screens that will secure the same results all on one kind of plate are far more complicated and difficult of adjustment; but any one who possesses a photospectrograph and a good assortment of coal-tar dies, can, by the exercise of some skill and ingenuity, make the adjustments for himself.

The set of three photographs of any object made as I have indicated of course show no colour whatever, but they contain in a permanent form such a graphic record of the natural colours that, in order to reproduce them to the eye, it is only necessary to superpose the three positive images either upon a screen or upon the retina of the eye—the one representing the red sensation with pure red light, the one representing the green sensation with pure green light, and the one representing the blue-violet sensation with blue-violet light. The blending of the three images will excite exactly the same sensation as the light coming directly to the eye from the object itself. The synthesis can also be made with superposed transparent colour prints, and this is the plan which has received the most attention, although the simplicity of *optical* superposition commends it to scientists, and is really more convincing to everybody.

Optical Superposition.

Both Duhauron and Cros had the idea of synthesis by optical superposition as well as by colour prints, but neither of them succeeded in carrying out the idea practically. Superposition by triple optical lantern projection was first carried out successfully by me in my demonstration at the Franklin Institute, Philadelphia, in February, 1888, showing a landscape photograph from nature. I employed a single lantern box, having three optical systems close together, with a triple limelight jet, and the three positives mounted side by side in a single wooden frame behind red, green, and blue glasses. A considerable variety of subjects were shown with the same lantern in November of the same year, when I first clearly stated and demonstrated the principle which represents the application of the Young-Helmholtz-Maxwell colour theory.

The first workable plan of optical superposition other than by lantern projection was devised by Antoine Hippolyte Cros, brother of Charles Cros, and patented in 1887. In this device, the three pictures are arranged relatively to each other like the steps of a staircase, and by means of a peculiar system of mirrors, some of which are attached to the face of a rapidly revolving wheel, with open spaces between them, the different pictures are seen by the eye in one optical plane, in such rapid succession, that they appear like a single picture with colours blended. The same device, which is a very ingenious one, was to be used also for making the negatives, but it is so clumsy, so troublesome, by reason of the necessity for providing means to keep the mirrors in motion, and includes such an extremely narrow angle of view, that I believe it has no practical value.

Both Duhauron and Cros taught that synthesis by optical superposition should be accomplished with the same mixtures of light rays that acted to produce the different negatives. The picture made through an orange screen was to be seen by the light transmitted by the same, or an exactly similar screen, and so on.

I hope I have made it clear that such a procedure is quite irrational, in view of the facts which support the Young-Helmholtz-Maxwell colour theory. The photograph made by the joint action of various different colours of spectrum rays must be seen by rays of one colour only. Spectrum rays of various colours excite one fundamental sensation, but only spectrum rays of one single colour will serve to represent that fundamental sensation.

I have taken particular pains to emphasise this fact in every paper I have published upon this subject, but have not yet succeeded in impressing it upon the minds of the French writers, who continue to assert that my procedure does not differ in any essential particular from that indicated by Duhauron and Cros. I think that this one difference alone is of vital importance.

Experiments in the Triple Lantern.

The application of the Young-Helmholtz-Maxwell theory involves important changes from the older methods, not only in the negative process, and in the synthesis by optical superposition, but also in the production of permanent colour prints. Theoretical considerations alone led me to conclude that a transparent colour print from either negative could be made to perform exactly the same function that the positive transparency from the same negative performs in the synthesis of triple-lantern projection, and a simple experiment with the triple lantern confirms my conclusions.

The white disc that we obtain in screen projection by mixing the red, green, and blue-violet lights, corresponds to the white paper which may form the basis of a permanent colour-print heliochrome. When we insert the positive of the red sensation in its place in the lantern, its shadows cut off the red light, leaving the disc still white, except in the shadows, where there remains only a mixture of the other two lights, green and blue-violet; a transparent print from the same negative performs the same function when laid upon the white paper, provided that its shadows also cut off the rays that excite the fundamental red sensation, but freely transmit the green and blue-violet. I have found that a coal-tar dye, sold as "thio blue A," absorbs those rays which excite the fundamental red sensation, but freely transmits the green and blue-violet; a Woodbury-type process print in this colour fulfils the requirement for a permanent print to represent (by transparency) the effect upon the fundamental red sensation. By a similar process I have found that fuchsine fulfils the requirement for making a print to represent the green sensation, and aniline yellow the print for the blue-violet sensation. It is true, as I have already pointed out, that these permanent colour-print heliochromes will show a slight degradation of colour in ordinary white light, but they should exactly reproduce the natural colours when viewed in a white light produced by mixing the red, green, and blue-violet spectrum rays.

The theoretical conditions of success have, therefore, been realised for the negative process, and for all three methods of synthesis.

The Heliochromoscope.

But there is another aspect of this subject, which, from a practical and commercial point of view, is quite as important as that of realising the theoretical conditions of success. I am of the opinion that, however perfect results this process could be made to give, it would not be reasonable to expect it to be commercially successful, so long as complicated by the necessity for making three separate photographic negatives and three separate photographic colour prints, in order to obtain a single reproduction in colours. Such a complicated procedure might be carried out successfully by experts, dealing with such subjects

as paintings or similar art objects, but would not be available for landscape photography, or in the hands of amateurs.

The only way to make the process simple and reliable enough to be available generally is to reduce the number of negatives to one, and dispense with the colour-print process altogether. This I have accomplished by the invention of a camera that makes the three pictures on a single plate, by one exposure from one point of view, and a device, which I have named the heliochromoscope, that optically recombines the triple black and white photograph into a single photograph reproducing the natural colours. With this camera (about the size of a kodak) and the heliochromoscope (the size of a hand stereoscope), the reproduction of the natural colour by photography is not only made practically available, but reduced to the simplicity of stereoscopic photography.

I wonder if people are prepared to realise the full significance of this fact. The hope of producing colour *prints* by a direct process is calculated to discredit the value of an equally simple method that accomplishes substantially the same result in a different way. I said "substantially the same result;" but, in a way, it is a better result, because it is quite impossible that any coloured picture, with its distracting surroundings and surface reflections, should ever produce such a perfect illusion of nature itself as we may obtain with this little instrument, consisting of several small mirrors, two of them transparent, placed at certain angles with reference to the photograph, and enclosed in a box. If the heliochromoscope was merely a box for seeing photographs in colours, it might be regarded with indifference; but I hold that it is as far from being merely that as the phonograph is from being merely a device for making a noise by turning a handle. It capable of accomplishing for us, in the reproduction of colours, more than the phonograph accomplishes for us in the production of sounds, because the illusion is more perfect. I quite believe that the writer who, in a recent article in *The Speaker*, described the heliochromoscope as a toy, comparable to the kaleidoscope, would have been capable, under similar circumstances, of comparing the phonograph to a baby's tin rattle.

Simplifying the Colour-Print Process.

I have also tried to simplify and perfect the colour-print process. The employment of the new triple camera, making one operation take the place of three, is one step in that direction. The use of the dyes I have mentioned, corresponding to the colours produced in screen demonstration, is another. The production of a single print instead of three, cutting the images apart only when ready to be dyed, is another. Experiment with the Woodburytype process is another. The Woodburytype process offers the vitally important advantage for reproduction in large numbers that, having found experimentally the right amount of dye required in each of the three colour prints, an indefinite number can be made without any variation; it will be available for the commercial production of lantern slides. These appear to be real advances; but, after all, the further complication and mechanical difficulties of carrying out the print-making process render it comparatively unsatisfactory up to the present time, and the value of composite heliochromy must be estimated, for the present, on the basis of its application to the photographic reproduction of the natural colours by optical superposition.

If the heliochromoscope is the only solution of the problem that is sufficiently simple to be practicable for general introduction, there is, nevertheless, a field for the application of the method of colour projection for lecture illustration. Here, also, we escape the complication and mechanical difficulties of colour printing, and obtain results which are permanent, as far as the colour record goes, and which can be shown to many people at one time. It will be necessary, however, to employ the arc electric light, in order to project landscape views at night as perfectly as they have already been projected by sunlight. The value of the method cannot be fully demonstrated with the limelight.

In conclusion, I would like to say another word to emphasise the fact, which I think is quite sufficiently demonstrated in the heliochromoscope, that, although we are not able to make photographs in natural colours of exactly the kind that people have been looking for, we have, nevertheless, found a true solution of the problem of reproducing the natural colours by photography, as remarkable in its results as the telephone or phonograph, more perfect in the illusion of nature than would be possible in coloured pictures, and almost as easy to realise as stereoscopic photography. It seems to me that this is an advance so great that it should finally break down the prejudice against the idea of composite heliochromy which has grown out of the long series of failures of unscientific, complicated, and impracticable methods. With no more operations than are required to make an ordinary photograph, we now make a photograph that, as we are able to see it, reproduces nature itself, light, shade, and colour.

F. E. Ives.

GELATINO-CHLORIDE-OF-SILVER PAPER: ITS MANIPULATION.*

The Alum Bath.

Taking a print from the washing water, place it in the bath, being sure it is covered with the solution and free from air-bells; then watch the results. With a bath strong in gold the change will begin almost at once. With some baths the prints will rapidly turn to a bright yellow, and on to brown and purple, and, when arrived at the required tone or slightly deeper judging by transmitted light, are transferred with a good rinse in clean water to the fixing bath. It is recommended, however, to wash the Ilford P.O.P. for five minutes before fixing. In the case of a slow bath several prints may be toned at once, taking care to keep them in pairs face to face, as otherwise the toning solution will not flow between them; but they will cling together and tone unevenly. Toning may be stopped at any point desirable, and considerable variation is thus obtained. Should the bath become exhausted whilst in use, gold should under no circumstances be added whilst the prints are therein, or unequal toning will result. In the event of the bath containing too much gold, the edges of the prints may tone before the centre; an alum bath before toning will generally prevent this. The fixing bath is best made of one ounce of hypo to ten of water without the admixture of any other substance, and the print should be placed therein, face upward, stirred about, thoroughly wetted, and allowed to remain therein certainly not less than fifteen minutes. The toned prints may, of course, be saved and all fixed at once, and it is then best to arrest the toning by placing the print in a bath of salt and water; the former method will, however, generally give a better tone. The true tone of the print is not attained until it is properly fixed, a considerable loss of tone and strength often taking place on the first immersion in the fixing bath; but when fixation is complete this should return. It is undesirable to use too strong a fixing bath, as the tone of the prints may be permanently reduced. I have never yet seen any indication of frilling or blistering with these papers; but I conclude that it does sometimes occur, as we find so many formulæ for its prevention. If such symptoms are visible, and an alum bath be used as is generally recommended, the prints should be laid therein face downwards, and must be most effectually washed after the alum bath and before toning or fixing, as the case may be, or the sulphocyanide or hypo will be decomposed, and the prints will eventually turn more or less yellow. A good bath, I believe, is chrome alum, one part; distilled water, 150 parts, with the addition of ammonia, until a permanent precipitate is formed. It should be filtered, and three or four minutes in this bath will effectually harden the gelatine and enable it to maintain its enamelled or matt surface less impaired by wear. In washing the prints the object to be attained is to completely remove the hypo in the least possible time, for if the hypo be not illuminated the prints are unstable, and if washing be too prolonged, the gelatine will possibly partly decompose.

Combined Toning and Fixing.

There are many good washers on the market, and those perform their work best which rely upon a stream of running water entering at the top with not too much force, and draw off from the bottom below the prints. With a good supply of water and such a washer, about two hours should be sufficient. Effectual washing may also be carried out in a series of changes of water at short intervals, or the moisture may be several times squeegeed out upon glass, or other substance, with washings in fresh water in between. All formulæ for the removal of hypo by other agents should be studiously avoided, as by their means the salt is merely converted into other compounds almost as detrimental to stability, and is not eliminated. Combined toning and fixing baths, the defects of which I pointed out, probably owe their extended use to the saving of trouble attendant upon the loss of separate fixing; but some of them are stupendous mixtures, and I imagine the chance of failure is rather increased by this complexity. The following bath, as recommended by Liesegang, answers very well with all brands of paper:—

A.

Water	24 ounces.
Hyposulphite of soda	6 ,,
Sulphocyanide of ammonium	1 ,,
Acetate of soda	1 ,,
Saturated solution of alum	2 ,,

B.

Dissolve thirty grains of nitrate of silver in half ounce of water; add thirty grains of common salt, stir well till a white precipitate is formed; pour B into A, and leave it for a day. Then filter, and add the following solution:—

C.

Water	6 ounces.
Chloride of gold	15 grains.
Chloride of ammonium	30 ,,

The bath will keep for any length of time. It can be used over and over till the light half tones of the print become of a greenish hue, which is an indication that the fixing agent is exhausted, when it must be replaced by a fresh bath. A fresh bath may take an hour or more to tone to the violet shade; after having been used several times it will tone

* Concluded from page 348.

quicker. The bath recommended by the Blackfriars Sensitising Company for their paper is very similar, the saturation of the bath with chloride of silver, which is necessary to the proper working of all combined baths, is here obtained by putting in waste prints, scraps, &c.

Water	24 ounces.
Hyposulphite of soda	6 ,,
Sulphocyanide of ammonium	1 ,,
Acetate of soda	1½ ,,
Alum saturated solution	10 ,,

Fill the bottle containing this solution with scraps of sensitised paper, bad prints, &c., which have not been fixed. Filter; allow to stand for one day, then add—

Water	6 ounces.
Chloride of gold	15 grains.
Chloride of ammonium	30 ,,

With this bath the prints require no preliminary washing. The prints are plunged direct into the solution, and allowed to remain until the desired tone is arrived at. A good and simple bath is:—

Chloride of gold	6 grains.
Nitrate of lead	3 ,,
Sodium hypo	3 ounces.
Distilled water	20 ,,

This bath has the advantage of being free from alum. It is best in all cases, when mixing combined toning and fixing baths, to dissolve the gold separately, and neutralise it with powdered chalk, and afterwards to filter, and add to the other salts, which should also have been dissolved and filtered. The necessary saturation of the bath with chloride of silver, I have already alluded to. The final washing is, of course, the same as where two separate baths are used. The weakest point in the combined baths is the uncertainty as to how far the prints are being fixed; this will, after a time, show itself by a greenish tint in the white; the bath is then worse than useless. In toning with uranium and gold, the following is a good bath:—

Chloride of gold	4 grains.
Uranium nitrate	4 ,,
Chloride of sodium	60 ,,
Acetate of sodium	60 ,,
Distilled water	16 ounces.

Dissolving the uranium and gold in a little of the water, and neutralise with chalk.

Platinum may be used for toning, and according to Obernetter the following formula will render pure sepia tones:—

No. 1.

Chloro platinite of potass	15 grains.
Distilled water	1 ounce.

No. 2.

Neutral oxalate potass	2 ounces.
Phosphate of potassium	12 grains.
Distilled water	40 ounces.

Use two parts of No. 2 to one and a half parts distilled water, and one part of No. 1. It is essential that chloro-platinite of potassium be used, and not the chloride of potassium of commerce. The formula recommended by the Platinotype Company is also considered good:—

No. 1.

Oxalate of potash	5 ounces.
Monopotassic ortho-phosphate	3 ,,
Water	50 ,,

No. 2.

Potassium chloro-platinite	60 grains.
Water	2 ounces.

taking three parts of No. 1, one part of No. 2, and two parts of water. These baths will not keep more than a couple of days. The prints must have a preparatory washing, as already described, and be prepared for the toning bath by a final wash in distilled water. They had best be placed in the toning bath face upward, and, when the action is complete, must be thoroughly washed in cold water, made slightly alkaline with carbonate of potash or soda, and are fixed as before described. The prints having been toned, fixed, and washed, there are several methods of finishing them. I generally prefer to dry them preparatory to any farther operation, as I am inclined to think that they are easier of manipulation if not quite so saturated as when taken direct from the last bath. If, however, they have been treated with chrome alum, and it is desired to finish them with any other than the natural surface, they must not be allowed to dry, or no amount of soaking will render them soft enough for future manipulation. Drying must be spontaneous, and heat must on no account be applied; hanging them by clips to a string is a good method, or laying them over a couple of parallel rods or strings. Care must be taken that no dust settles upon them, especially dust from a dark room or laboratory. If left to dry thus, their natural surface will be equal to, or more shiny than, albumenised paper, and they may be thus trimmed and mounted. Should any deposit from the water appear upon the face of the print, it may be removed by wetting the print and gently rubbing the face with a tuft of cotton wool. The detail in the prints, when dry, will be considerably clearer than when wet, owing to the greater opacity of the paper.

Finishing the Prints.

The surface of the prints may be slightly reduced in shinyness by pressing them between sheets of blotting-paper before they are quite dry. They must not, however, be wet, or sticking will occur. To finish the prints with a matt surface, they may be squeegeed upon fine ground glass, such as should be used for focussing screens. The ordinary ground glass of commerce will not do, as it will show glazed specks. The glass must be thoroughly clean. An ordinary scrubbing-brush and Brooke's Monkey Brand will effect this in a few moments, and it can then be left to dry, or be dried with a cloth, and the surface be dusted over with a tuft of cotton wool dipped in powdered talc, otherwise known as French chalk, which in turn is removed by rubbing with a piece of clean silk or linen, so that no talc is visible. The prints, having been soaked for a few minutes, are then pressed into contact with the glass, using a roller squeegee and some little force, and a piece of clean paper on the back of the print to prevent tearing. The air must be entirely pressed out, and the prints will then adhere more closely to the glass; and, when dry, a piece of cartridge paper, or special waterproof paper, sold for the purpose, and cut to the exact size, is mounted upon the back. When the prints and their backing are thoroughly dry, they will easily peel from the glass support, just raising one corner with the edge of a knife. Should the prints refuse to move through the use of common or dirty glass, they may be taken off by soaking in a weak solution of hydrochloric acid and water. There is another method of matting the surface, which I have been trying lately, namely, by lightly rubbing the surface of the print with clean white pumice or other powder having a fine tooth. This is a vastly easier method, and, I think, as good. Prints which are lighter than desired are especially benefited by matting their surfaces, and will appear considerably stronger than if finished with a glossy surface. In like manner, prints may be given an enamelled surface by squeegeeing upon the best British polished plate glass. The plate glass must be carefully handled, or it will get scratched, it being comparatively soft after the removal of the surface in polishing. Polished or matt celluloid ebonite, tin-type plate, or enamelled metal plates may be obtained and used for the same purpose as glass, and these will not require the use of talc; but, in the event of the prints not stripping properly, a trace of sweet oil may be rubbed on and removed. The principal point is to let the prints get thoroughly dry before attempting to strip them off. The waterproof backing before mentioned is applied to facilitate mounting, as, if the prints are stripped from the supports without it, difficulty may be experienced in preserving the highly glazed or matt surface when the mountant is applied, and the wet strikes through the prints. The glass may also be prepared with wax and benzole in a somewhat similar manner:—Yellow resin, 36 grains; yellow wax, 24 grains. Two ounces of benzole formed into a solution and spread over the glass with a tuft of cotton wool, and then polished off with clean cotton wool. The print is floated face downwards in a dish of clean water, the plate inserted below it, and the two brought up and out of the water, and treated as before described. Gelatino-chloride prints are more difficult to mount than prints upon albumenised paper, but failure need never result if only ordinary care be exercised. Those prints which are backed with paper may very well be mounted with starch or similar mountant, made as thick as possible, taking care that no hard lumps are formed. If the prints are finished with a matt or brilliant surface, and do not receive a backing of waterproof paper, starch and paste are not suitable mountants, and recourse must be had to shellac and alcohol, or gelatine and alcohol. These may be bought ready prepared at most dealers, and if used with care the glazed or matt surface will be little the worse. If desired to manufacture, these mountants receipts are to be found in such books as The British Journal Photographic Almanac, &c. The exact position the print is to occupy should be marked upon the mount if there is a wide border, the print laid face downwards upon a piece of clean blotting-paper, and the mountant brushed rapidly over the back with a stiff hog-air tool. The mountants are mostly used hot, being stood in a basin of hot water. The mountants may also be applied to the edges only by laying a sheet of paper upon the back of the print, cut so as to show one-eighth of an inch margin all round, the mountant being brushed upon this exposed part; the prints must, however, be very slightly damp to allow of this treatment without after cockling.

Mounting.

Another method of mounting, exceedingly easy to work, is to squeegee the trimmed print upon glass, and when nearly dry to work some strong starch into the back with a stiff brush, and leave to dry, and then strip from the glass. The mount is then wetted with sponge and water, and the print laid upon a wet mount and squeegeed down. A solution of indiarubber may also be used for mounting round the edges, and may be bought ready prepared, but is liable to decay. If it is desired only to retain the ordinary surface of the paper, the simplest method is to soak the trimmed print for a few minutes in cold water, then taking a print lay face downward upon a sheet of paper, blot off the moisture from the

back, and apply a warm gelatine and alcohol mountant, lay the print in its position upon the mount, and on the wet face a clean sheet of note paper, and press down with a soft pad of clean linen, wetting if necessary. The points to be observed in mounting are, not to apply too much mountant or it will press out at the edges, and not to place the prints under pressure until almost quite dry. There is a considerable advantage in using the best prepared mounting boards, as many deleterious chemicals, amongst them hypo and acids, are used in the manufacture of ordinary cards. Spotting may be done with pigment mixed with gum arabic, and if carefully executed will not show.

I am afraid in reading this paper I have been going over ground which most of you are as well or better acquainted with than I am. Instructions for the process are scattered broadcast over the land, and any one who will read and carefully follow them out may be assured of good results. The mechanical part of the process requires only care to work it, and so long as it is done well, the less time occupied by it, the more effort may be concentrated into those operations, such as printing and toning, where there is opportunity for the use and display of artistic feeling and knowledge. The capacity for making brilliant prints by this or that process is, to my mind, as nothing compared with the power to use to the full those qualities by which we may easily render or alter to suit the requirements of taste the forms and values as they are often crudely represented upon our negatives, and in its capacity to fulfil these requirements I believe the gelatino-chloride process to be capable of holding its own against any other.

J. C. S. Mummery.

COMPOSITE HELIOCHROMY.

Listening attentively the other evening, and with much interest, while Mr. Ives discoursed on the above subject at the Society of Arts, the idea occurred to me how singularly Mr. Ives and earlier experimenters seemed to have missed one of the simplest mechanical and optical means of securing the superposition of the differently coloured positives which go to make the composite picture. A drawing was shown of the plan proposed by Antoine Hippolyte Cros, which was a most complicated arrangement of revolving mirrors, involving some most difficult adjustments. Mr. Ives' own system, as in his "helio-chromoscope," was not described, but is known to consist of a series of glasses, dividing and reflecting the images until they meet at the eyepiece; and the number of surfaces seemed, in practice as well as in theory, to involve a good deal of cleaning to avoid moisture and dust. It occurred to me that a simpler plan than either had been overlooked, and I suggested to Mr. Ives after the meeting that he might find a commercial solution of this part of his work in the following direction. Those who remember the Polytechnic of thirty-five to forty years ago will recollect the earliest forms of the Zoëtrope, or wheel of life, there shown. A disc, with slits, revolving before the reflected images of graduated pictures, gave the appearance of life and motion, since so well known in the Zoëtrope, Praxinoscope, &c.

It seemed to me that adopting this principle it would only be necessary to set the three positives equidistantly as the radii of a circle, the bases accurately directed to the centre, and to mount the film so arranged on a framework attached to a spindle carrying a disc with three slits adjusted to these pictures. The whole being then rapidly revolved by a suitable appliance, and viewed either direct or through a magnifying eyepiece, would, under the law of persistence of vision, produce a similar result to that of the wheel of life, with the difference that the effect would be combination of colour, instead of apparent motion. Some day, I have no doubt, when heliochromy has become a commercial line, this plan of working will be brought forward as something new. I hope no one, then, will try to patent the idea.

W. Bishop.

A NEW DRY PLATE.

Two inherent defects of most gelatine plates are a liability to the phenomenon of halation, due, as our readers are aware, to the intermingling of the high lights of a picture with the darker parts, caused chiefly by reflections from the backs of the plates, and an inability to allow of any considerable latitude of exposure with normal, or even in many cases with abnormal, development. With the object of obviating the occurrence of the first-named evil, and at the same time of producing a sensitive surface admitting of an extension of the scale within the limits of which almost any exposure will allow of a good negative being easily developed, Messrs. R. W. Thomas & Co. have produced a new plate—called the "Sandell" plate, after the manager of the firm—at whose works we recently had an opportunity of witnessing some comparative experiments intended to illustrate its special advantages.

The new plate consists of two or more films of different degrees of sensitiveness, a slow emulsion forming, as it were, the substratum, a quick one the top coating. In the experiments, the "General"—that is the new plate—which is intended for all ordinary purposes, was pitted against the firm's Extra Rapid plates, and a series of equal exposures, ranging from a tenth of a second to fifteen seconds, made in bright sunshine with a lens of a given aperture. One of each variety was developed at a time in a normal, unrestrained developing solution. The exposures proved to be excessive in all cases, the ordinary plates, after fixation, presenting an over-dense, burnt-up, foggy appearance, suggestive of the impossibility of converting them into good printing negatives. The surfaces of the negatives on the "General" plates were, before fixation, extremely foggy; but, in contradistinction to the others, the images were not forced through to the backs of the plates, and, by transmitted light, could be seen to have retained due vigour and gradation, and proper density. After fixation both sets of negatives were "cleared" in a ferridcyanide bath. Those on the ordinary plates, however, still preserved the worst effects of over-exposure, such as flatness of image and general fog, the latter being very marked where the high lights met the shadows. On the other hand, the negatives on the "General" plates came out extremely brilliant and clear—full of sparkle, in fact—of excellent printing density, and having an admirable modelling of image. Indeed, we found it a difficult matter to differentiate between the negatives on the score of exposure, which, as we have indicated, had a range of from 1 to 150—a severe test.

The "Sandell" plate should simplify the difficulties attendant upon exposure, and will, doubtless, enable many a negative to be saved which if taken on an ordinary plate and very much over-exposed, would be lost.

"OPTIMUS" PRIZES.

Prizes to the extent of a hundred guineas for productions by the lenses manufactured by the "Optimus" (Perken, Son, & Rayment) Company remind one of enterprise displayed by some transatlantic firms, although never to our knowledge have these firms carried out the idea to quite such an extent as that manifested by the English firm.

This competition is open to all, whether amateurs or professionals. The conditions are very plainly laid down as follows:—1. Every prize-winner shall be required to make an affidavit that his negative has been produced by the aid of a lens bearing the trade mark "Optimus," and name, "Perken, Son, & Rayment" engraved on the mount, within the given period, and shall produce the lens if called upon. All prints sent in to this competition shall become the property of Messrs. Perken, Son, & Rayment. The negatives of the prize prints shall also become their property. 2. That every print must be from a negative produced since January 1, 1892. 3. The artistic trimming of prints shall be allowed, but in all cases the full size of the negative must be stated on the face of mount and entry form. 4. Enlargements or prints from enlarged negatives will not be admissible. 5. The whole work must be done solely by the competitor. 6. All prints shall be mounted, and bear on the face of the mount in the middle, half an inch below the base of the picture, a written or printed title, and on the back a *nom-de-plume*. The mount must not project more than one-third of the picture on each side; for example, the mount for a print measuring $7\frac{1}{2} \times 5$ must not measure more than $12\frac{1}{2} \times 8\frac{1}{2}$ inches. 7. With each print must be enclosed an envelop bearing on the outside the *nom-de-plume*, and inside an entry form, duly filled up, bearing competitor's name and address. 8. All prints and entry forms must be received by October 31, by E. J. Wall, 1, Creed-lane, E.C., and must be marked outside "'Optimus' Competition."

The Classes are:—1. Landscape, with and without figure. Sub-class A, 7×5 and under; sub-class B, $8\frac{1}{2} \times 6\frac{1}{2}$ and over. 2. Seascape. Sub-class A, 7×5 and under; sub-class B, $8\frac{1}{2} \times 6\frac{1}{2}$ and over. 3. Portraiture and figure study. Sub-class A, 7×5 and under; sub-class B, $8\frac{1}{2} \times 6\frac{1}{2}$ and over. 4. Instantaneous work, including also hand-camera work, limited to 5×4 and under.

The prizes offered to each successful competitor are such as must prove exceedingly tempting, and they are so arranged that each prize winner may select from them any one or the other that suits his fancy or requirements, all being of the same value, viz., 15*l*. each.

Set A, 10×8:—Rayment camera and two double dark slides. "Optimus" rapid view lens. "Optimus" tripod stand. "Optimus" focussing magnifier and focussing cloth. "Optimus" collapsing waterproof case.

Set B, $8\frac{1}{2} \times 6\frac{1}{2}$:—Rayment camera and three double dark slides. "Optimus" rapid rectilinear lens. "Optimus" tripod stand. "Optimus"

focussing magnifier and focussing cloth. "Optimus" leather case with lock and key.

Set C, 6½ × 4½:—Rayment camera and three double dark slides. "Optimus" euryscope lens. "Optimus" plunge shutter. "Optimus" fourfold tripod. "Optimus" focussing magnifier and focussing cloth. "Optimus" waterproof case with lock and key.

Set D, 3½ × 3½:—"Optimus" hand or detective camera, including six dark slides. "Optimus" rapid euryscope lens and shutter. "Optimus" enlarging apparatus, ornamental mahogany body, lined with metal, patent focussing adjustment, with six-inch compound condenser, also a four-inch for the projection of lantern slides.

Set E.—"Optimus" scout field-glass, with aluminium body. "Optimus" obique hand camera, with single view lens, shutter, and three double dark slides. "Optimus" photographoscope, a very handsome table ornament, having mechanical contrivance for displaying a number of cabinet pictures one after the other in endless rotation.

Set F.—Superior aluminium telescope.

It is, of course, necessary that each competitor make an affidavit that the picture was actually taken by an "Optimus" lens, the number of which, as engraved on the mount, must be given, and that the whole of the work of exposure, developing, printing, toning, and mounting was done by him or her since January 1 of the present year.

We have seen and examined the various prizes, and can vouch for their being, in every sense, first-class. Messrs. Perken, Son, and Rayment's enterprise should produce a most interesting competition.

The "Optimus" Universal Lens Flange.

The difficulty of attaching the multifariously-flanged lenses to a camera front is one on which we have many times written. We therefore hail with delight the introduction of any piece of mechanism which will enable this to be done with the maximum of efficiency and the minimum of trouble.

An appliance which is now about to be introduced under the name of the "Optimus" Universal Lens Flange meets with our warmest approval, as it must, with all who use a variety of lenses and do not care to carry with them a separate camera front for each. By this universal flange adapter, which is shown in the cut, having been screwed on the camera front in the usual way, we now possess a means of instantaneously and firmly attaching any one of our numerous series of lenses and changing them at will. The movements to attain this end are not only the most rapid but also the most simple yet contrived. This will be very readily understood if we say that the little arrangement is an ingenious application of the bayonet catch.

Three semicircular recesses are made on the margin of the lens flanges. These recesses correspond with three internal projections on the universal flange. The particular lens about to be used is pushed into the aperture of ring A on the cut. The lens being held firmly, about one-eighth of a revolution is described, when it will be found that rigid contact has been established between lens and camera. A reversal of the movement releases the lens, and others may be consecutively connected.

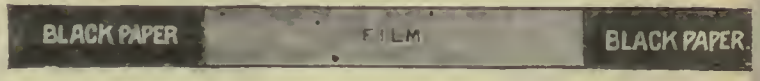
Those carrying with them a variety of lenses will hail this new flange with satisfaction.

NEW KODAKS.

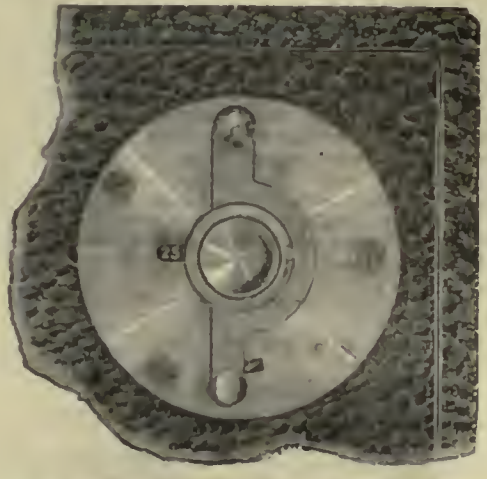
During the present week the well-known "Kodak" of the Eastman Company has entered upon a new, nay, a revolutionary stage of existence. Hitherto it has been manufactured in such a form as necessarily represented a price which, although moderate considering its get-up, was yet in excess of what many might be able to afford; but by discarding such refinements as Russia leather, morocco, and their cognates, and presumably by improved machinery in the production of the instrument, the Company now introduce a series of Kodaks so low in price as to beggar all preconceived ideas as to their cost.

The new series is known as the A B C Kodaks, and, as the prospectus says, "are designed especially for a very large and increasing number of amateurs, who do not care to purchase an expensive instrument. The letters A B C refer primarily to sizes, but they may be taken, in another sense, to indicate the great value of these instruments for beginners; they are extremely simple in construction, and will supply a want long felt for a really well-made camera of great capacity, enabling the beginner to commence at the A B C of Photography, and produce good results." The retail price of this series varies from twenty-six shillings to sixty-five shillings, according to size, a small advance on this price conferring the advantages of having a focussing arrangement and a leather-covered body, fitted with spools for reloading *in daylight*, a recently introduced improvement, which renders one independent of a dark room when *en route*.

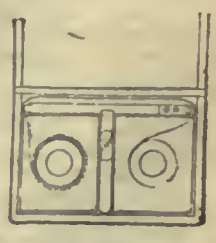
The power of reloading in daylight is one of inestimable value. The general principle is this: attached to each end of the sensitive film is a band of black paper, which, being wound round the film, prevents the



admission of light to it. It can therefore be handled in open daylight. The operation of charging the spools can be performed out of doors, by—after the twenty-fourth exposure has been made, and before the Kodak has been opened—pushing the register lever to the right, and winding the key, the operation being repeated until no more material can



be obtained. The empty spool taken from the Kodak being placed alongside (we quote from the directions), take the end of the paper protruding



from the fresh spool box, and draw it over to meet the paper on the empty spool, and fasten them together by moistening the gummed edge of the fresh spool. Allow the gummed edge to dry for five minutes.

Replace the spool boxes in the roll-holder, slotted ends down, the full spool at the left, and the film passing over the exposing board to the box containing the empty spool.

Replace and screw down the lid, and put the holder in its place on the camera.

The combination of advantages embodied in the new Kodaks should secure them a large share of favour, the facility for changing the spools in daylight being a boon of inestimable value.

CASTLE WEMYSS AMATEUR PHOTOGRAPHIC EXHIBITION.

The second Exhibition, exclusively for amateurs, was held at Castle Wemyss on Friday and Saturday, May 27 and 28.

This Exhibition is quite unique in its way, being got up, advertised, and conducted by a lady, Miss Burns, of Castle Wemyss, who is herself an enthusiastic and successful photographer. In the centre of the castle grounds, in a winter tennis hall, the Exhibition was located, this hall possessing plenty of space and being extremely well lighted.

Miss Burns, who takes upon herself all the responsibility of the undertaking, must feel highly gratified at the hearty response made to her circulars, for, although in quantity the number of exhibits sent in was scarcely up to those sent in on the first occasion, the quality showed a much higher standard of merit.

One thing that militates against a much larger show of exhibits at this Exhibition is, we believe, the limited time the exhibitors have to prepare their work. This cannot well be avoided, for the lady cannot date forward the same as a committee working up an exhibition, as it is only when she has a few clear weeks that the pleasant pastime can be indulged in and worked out.

Still we are of opinion that, if three or four months were allowed to prepare the work, the hall would be filled to overflowing with exhibits. The long distances that many of the present exhibits have come is surprising, and speaks well for the future.

The Judges were Messrs. Francis Powell, John Fergus, George Mason, and H. E. Gordon.

The following is the list of awards:—Portrait or group (photographer under two years' experience).—First prize, silver medal: Mrs. Mceta Pollard, for *Miss Nettie Beattie;* second prize, bronze medal: none awarded. Landscape or seascape (photographer under two years' experience).—First prize, silver medal: Mr. Pollock, for *In Clandeboye Demesne;* second prize, bronze medal: Miss Martin for *The Fruin.* Portrait or group.—First prize, silver medal: Mr. Evans, for *Only a Street Arab;* second prize, bronze medal: Mr. J. Chamberlain, for *Eastern Fantasia.* Landscape or seascape ($8\frac{1}{2} \times 6\frac{1}{2}$ and over).—First prize, silver medal: Mr. Austin, for *Off to the Plough;* second prize, bronze medal: Mr. Stewart Smith, for *Kelly Sawmill.* Landscape or seascape (8×5 and under).—First prize, silver medal: Mr. Martin, for *Loch Linnhe;* second prize, bronze medal: Miss Brock, for *The Fruin.* Instantaneous.—First prize, silver medal: Mr. Martin, for *Swans;* second prize, bronze medal: Mr. A. Watson, for *Yacht.* Animal study.—First prize, silver medal: Mr. Austin, for *Cooling Waters;* second prize, bronze medal: Mr. F. Mackenzie, for *Highland Cattle.* Enlargement.—First prize, silver medal: Mr. Austin, for *Winter;* second prize, bronze medal: Mr. Morison, for *Watering the Horses.* Lantern slides (set of six).—First prize, silver medal: Mr. Arch. Watson; second prize, bronze medal: Mr. D. Cunningham and Mr. Austin (equal).

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 9213.—"Improvements in Negative Film Roll Holders for Photographic Cameras." J. R. A. Stuart.—*Dated May* 16, 1892.

No. 9214.—"Improvements in Apparatus for Operating Negative Films in Photographic Cameras." J. R. A. Stuart.—*Dated May* 16, 1892.

No. 9218.—"A Process of Treating Gelatino-chloride of Silver Papers by Development and Toning same without Gold or other Metals." E. J. Browne.—*Dated May* 16, 1892.

No. 9294.—"Improvements in or connected with Photographic Cameras." Complete specification. E. V. Swinden and J. Earp.—*Dated May* 17, 1892.

No. 9471.—"Improvements in Photographic Roll Holders." A. L. Adams. *Dated May* 18, 1892.

No. 9494.—"An Improved Appliance for Locking or Securing Tripods Employed for Supporting Photographic Cameras or similar Instruments." W. E. Henry.—*Dated May* 19, 1892.

No. 9535.—"Improvements in Photographic Apparatus." J. D. Lysaght.—*Dated May* 19, 1892.

No. 9700.—"Improvements in Tables or Beds for the Manufacture of Photographic Films." W. H. Walker.—*Dated May* 21, 1892.

No. 9721.—"A New or Improved Photographic Accessory for Portrait Photography." E. S. Lauder and J. S. Lauder.—*Dated May* 23, 1892.

No. 9819.—"Improvements in Photographic Cameras." C. Beck and J. T. Clarke.—*Dated May* 24, 1892.

No. 9820.—"Improvements in Photographic Camera Shutters." C. Beck and J. T. Clarke.—*Dated May* 24, 1892.

No. 9926.—"Improvements in Photography by Means of Coloured Glasses used in Combination with the Photographic Lens." A. Burchett.—*Dated May* 26, 1892.

No. 9943.—"Improvements in the Finishing of Photographic and other Prints." J. B. Brooks and J. Lewis.—*Dated May* 26, 1892.

No. 9991.—"Improvements in Photographic Cameras." A. H. Townsend and E. Parker.—*Dated May* 26, 1892.

No. 10,023.—"An Improved Developing Tray or Dish for Photographic Purposes." A. Desboutin.—*Dated May* 26, 1892.

No. 10,033.—"An Improved Form of Photographic Tripod Stand." A. R. Wormald.—*Dated May* 26, 1892.

No. 10,167.—"Improvements in Photographic Cameras." J. F. Parsons.—*Dated May* 28, 1892.

No. 10,191.—"A New or Improved Appliance to Photographic Changing Boxes or 'Magazine' Cameras." A. L. Adams.—*Dated May* 28, 1892.

SPECIFICATION PUBLISHED.

1890.

No. 4704.—"Photographic Cameras." Varley.

Amended Specification.

1887.

No. 13,879.—"Photographic Cameras." Swinden & Earp.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
June 7	Exeter	College Hall, South-street, Exeter.
,, 7	Glossop Dale	Rooms, Howard-chambers, Glossop.
,, 7	Herefordshire	Mansion House, Hereford.
,, 7	Lewes	Fitzroy Library, High-st., Lewes.
,, 7	North London	Wellington Hall, Islington, N.
,, 7	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 7	Rotherham	
,, 7	Sheffield Photo. Society	Masonic Hall, Surrey-street.
,, 7	York	Victoria Hall, York.
,, 8	Leicester and Leicestershire	Mayor's Parlour, Old Town Hall.
,, 8	Munster	School of Art, Nelson-place, Cork.
,, 8	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 8	Reading	
,, 8	Stockport	Mechanics' Institute, Stockport.
,, 9	Birkenhead Photo. Association	Association Rooms, Price-street.
,, 9	Bradford Photo. Society	50, Godwin-street, Bradford.
,, 9	Hackney	Morley Hall, Triangle, Hackney.
,, 9	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 9	Manchester Photo. Society	36, George-street, Manchester.
,, 9	North Kent	Gravesend.
,, 9	Oldham	The Lyceum, Union-street, Oldham.
,, 10	Cardiff	
,, 10	Holborn	
,, 10	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 10	Maidstone	"The Palace," Maidstone.
,, 10	Richmond	Greyhound Hotel, Richmond.
,, 10	West London	Chiswick School of Art, Chiswick.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 26,—Mr. J. Weir Brown in the chair.

Meteorological Photography.

Mr. A. W. Clayden, M.A., the Secretary of the Committee on Meteorological Photography, appointed by the British Association, gave a brief discourse on this subject, illustrated by numerous lantern slides, first of all describing and exhibiting the camera he uses for this class of work. This consists of a swing camera, with a revolving black glass mirror inclined to the axis of the lens. The mirror being arranged to extinguish the polarising component from blue sky, there was, said Mr. Clayden, remarkable detail when one looked at a cloud on the screen, and this was partly due to the extraction of the polarised component of the blue light, and a good deal to the diminution of the brightness of the image. It enabled one to judge the exposure carefully. Having pointed out the objects of meteorological photography, he said that, when he began photographing clouds, he endeavoured to find out whether there was any kind of plate which had special advantages for this particular purpose. He had found there was not very much to choose between the various kinds. The Committee wished photographers to take photographs of thunder clouds, &c., at short intervals, so as to have successive photographs in order to be able to study the development of one form of cloud out of another, and in its various transition forms. In connexion with lightning photography, a number of points had never been cleared up, as, for example, the cause of the black flash.

Mr. Clayden then exhibited a number of lantern slides of cumulus and cirrus clouds in various stages of formation, together with several slides of lightning flashes. Some of these were taken with a hand camera, and the fact that some of the flashes took a triple form led him to question whether he had not moved the camera during the exposure. In connexion with some pictures of the black flash, the phenomenon of reversal was shown. He had tried to get reversal with the electric spark, and had succeeded by allowing diffused light to have access to the plate after exposure. Diffused light on the plate before exposure did not produce reversal.

Mr. W. E. DEBENHAM, in reference to a complaint of Mr. Clayden as to the granularity of some of the pictures which were intensified with mercury, said the granularity would not appear if the plates were kept well moving during intensification.

Mr. J. E. SMITH asked Mr. Clayden if he had ever succeeded in photographing a rainbow!

Mr. CLAYDEN had done so, but it was not a very brilliant image.

Mr. G. W. ATKINS, in connexion with Mr. Clayden's suggestion as to successive discharges of lightning having produced three images of a signal-post in one of the pictures shown, said that on one occasion during a flash he had seen a signal-post in three different positions.

Mr. DEBENHAM pointed out that the fact of the plates not having been backed was sufficient to cause reversal of the image in some of the pictures, and said it was extremely desirable that in these experiments backed plates should be used.

After some further discussion, a vote of thanks was passed to Mr. Clayden.

Mr. ASKEW exhibited his combination oil lantern, which is rapidly set up on an ordinary tripod. The whole packs up very compactly, and may be carried on an ordinary bicycle. It is chiefly intended for village use.

The meeting then terminated.

Holborn Camera Club.—May 27, Mr. T. O. Dear in the chair.—A large number of slides which had taken prizes in a competition were passed through the lantern, followed by some by Messrs. Ebsworth Cobb, and Miller.

Harlesden and Willesden Photographic Society.—May 24, Annual General Meeting.—The following officers were elected:—*President:* Mr. John Naylor.—*Council:* Messrs. T. Clapton, Pay, C. Winterbon, H. Dale, and Lyon.—*Hon. Treasurer:* Mr. Seed.—*Hon. Secretary:* Mr. W. E. Woodbury, 23, Fairlight-avenue, Harlesden, N.W. An excursion to Stanmore, under the leadership of the President, Mr. Naylor, will take place on Saturday, June 4, the members to meet at the booking-office, Willesden Junction, at 2.30 p.m.

Bath Photographic Society.—May 28, the first excursion of the season.—The party travelled to Holcombe. Here a disused old church was found, possessing a very perfect specimen of a Norman doorway, supposed to have been taken from some older buildings, and, among other things, some curious epitaphs in the churchyard, dated 1800. Here is one:—

"Come read your doom,	One day with me
And see you must	Lye in the dust."

Norton Hall is very pleasantly situated in extensive grounds, adjacent to the main road through the coal districts, many portions of this road being of Roman construction. Besides extensive views of the famous Mendip range obtainable from the house and grounds, many picturesque scenes were depicted as the party rambled over the domain.

Birmingham Photographic Society.—May 26, Mr. G. F. Lyndon in the chair.—SIX new members were elected. Samples of Berkeley's "Theonine" and one of Mawson's "Sensible" focusing cloths were laid on the table. Mr. A. J. Lesson gave a demonstration and paper on the *Preparation of Home-salted and Sensitised Paper by the Ammonia Nitrate of Silver Process.* The demonstrator went through the different operations of salting, sensitising, toning, fixing, &c., showing very clearly the manner in which the work is done. Mr. LESSON said one of the advantages of salting and sensitising one's own paper is that paper suitable for all subjects is easily prepared, whether the detail is wanted to be microscopically sharp or whether it is required that it shall be softened down in the charming manner obtainable by means of the rough paper. There will, of course, always be two opinions about the rendering of detail; but a great deal depends upon the class of subject which is represented and the fancy of the printer. The paper to be used—the paper I generally use—is Whatman's hand-made water-colour paper; but so long as it is pure, of an even surface, will stand plenty of washing, and is of a good colour, it is immaterial whose make is used. Mr. Lyonel Clark recommends Reeves & Son's Arnold's unbleached; but it is not necessary to use paper at all, for silk, satins, wood, &c., may be used instead. Whatman's have a number of papers with different surfaces, from the very smooth to the very rough, so that all one has to do is to suit the paper to the negative. The colours obtainable is a great feature of this process; brown, reddish-browns, sepia, purple, black, &c., are very easily acquired, and there is no difficulty with whites, except, perhaps, at the edges, and for that reason I sensitise a little larger-sized piece of paper than I require, so that the outside edge may be trimmed off. An imperial sheet of Whatman's paper will cut up into six pieces 10×8 and three pieces 10×6. These sizes allow for masking off a margin when printing from whole-plates or under. I ordered from a local mount-maker a number of masks cut to required sizes, so that I can at any time adjust the mask to the size of the picture required. The salting solution I generally use is made up as follows:—Chloride of ammonium (not sal ammoniac), 7 parts or 2 drachms; gelatine, 12 parts or 3½ drachms; water (warm), 1000 parts or 36 ounces. The chloride of ammonium is put into the solution when nearly cold. The prints are placed in this, and brushed over with a tuft of cotton wool, and allowed to lie immersed till the paper is fully expanded. They are then taken out separately and hung up to dry in a warm room. If preferred, the prints may be floated for about three minutes on the bath singly. Always use the bath pretty warm, or the gelatine will set in patches. Thin negatives require more ammonium chloride than dense ones. Rapidity of printing is obtained by the use of more salt with the gelatine; it also makes a more vigorous print. The paper now contains ammonium chloride; but, as this is insensible to the rays of light, silver, in the form of a nitrate, is applied. This combines with ammonium chloride, the latter giving up its chlorine to the silver, forming chloride of silver, and the ammonia takes up the nitrogen, forming a soluble salt, ammonic nitrate. This silver chloride darkens on being exposed to the light. The sensitising bath is made up as follows:—Nitrate of silver, 2 parts or 3 drachms 12 grains; distilled water, 10 parts or 2 ounces. (It is not absolutely necessary that the water should be distilled, but the purer the water the better.) The nitrate is dissolved in the water, and is then converted into "ammonia nitrate of silver" by adding ammonia drop by drop till the precipitate first formed is redissolved. It is then divided into two equal parts, to one of which add nitric acid till the litmus test shows that it is slightly acid. The two halves are then mixed, and the bulk made up with water to twenty parts, or four ounces. The bath need not be protected in the slightest from light; in fact, silver baths are often improved by being sunned. The solution is now brushed over the paper on the right side. I always place the paper on a large sheet of plate glass inclined a little by being placed in a large porcelain dish, the bottom of the glass resting on the bottom of the dish against one side, and the opposite side of the dish supporting the glass plate. On this I place a sheet of blotting-paper, and then the paper to be sensitised. The blotting-paper absorbs any solution which may come over the sides of the paper, and, should any quantity flow off, the dish prevents it reaching the table. The solution is then brushed over the paper in broad sweeps by means of a good-sized camel's-hair brush (avoid brushes bound with wire), commencing at the top and working from left to right till the bottom is reached. The paper is then turned at right angles to its previous position, and the brushing repeated so that it will cross the lines of the other coating; it can then be hung on a peg to dry. This process is then repeated, as the nitrate of silver must be in excess. This paper, when prepared, will not keep like the ordinary sensitised paper of commerce, but should be sensitised, toned, and fixed in the day, or within forty-eight hours at longest. Should it be wanted to be kept a time before being toned, a different formula will be required. Mr. Clark recommends the following:—Nitrate of silver, 60 grains; citric acid (crystals), 25 grains; water, 10 ounces. As in albumenised paper, the citrate of silver keeps so much better than the nitrate, as it is the free nitrate which discolours the paper. One can tone with almost any toning bath, the prints toning much quicker than the ordinary silver paper; in fact, for the following bath, which I always use, the tone varies between forty-five seconds for a warm brown to three minutes for a purple black. Toning bath:—borax, 30 grains; chloride gold, ½ grain; water (warm), 6 ounces. This bath can be used at once, and while warm; no appreciable difference will be noticed in the colour until put into the fixing solution, when the colour instantly begins to change to the tint required. After washing, the print is placed in a fairly strong hypo bath for ten minutes, and it is then as well to place it in a second hypo bath, so as to be quite sure all the free silver is removed. The prints are then washed thoroughly, and dried by being hung up by one corner, previous to which I place them between blotting-paper to absorb all the water from the surface of the print. These prints lend themselves to spotting very easily, as the colour is not repelled, as is the case with albumenised paper, and the colours are easily obtained. In conclusion, I would draw your attention to a few notes it is as well to bear in mind. It is best, if possible, to salt and sensitise the paper in double-length strips. One advantage of Whatman's paper is that the name is confined to one quarter sheet. Don't make enough salting solution to last more than a month, or it will rot. Keep the bath warm while salting. If rapidity or vigour is required, use more salt. Once sensitising is often not sufficient; repeat the process, in order to be on the safe side. Don't dry it too quickly. Sensitise, tone, and fix, if possible, in one day, as by so doing cleaner prints are obtained. The pluckier the negative, the richer the tone. Wash thoroughly. Stains of silver may be removed by salt, hypo, or cyanide of potassium. Be sure the paper is perfectly dry before placing it in the printing frame, or it will spoil the negative. Print deeper than is usual for albumenised paper. Wash in a change or two of water before toning; wash well after toning and before fixing; wash very thoroughly after fixing.

Liverpool Amateur Photographic Association.—May 26, Mr. W. Tomkinson, the President, in the chair.—Two new members were elected. Mr. SCHIERWATER introduced a discussion on *Film Photography*, giving his experience of the use of films by different makers, and showing an ingenious carrier for the dark slide, and also one for the developing dish of his own construction. Mr. A. W. BEER stated that, in a tour on the Continent last year, he, with a friend, used twenty-four dozen 10×8 films with most satisfactory results, and hoped to do the same again this year. He had not the least difficulty with development, as by keeping the bottom of the dish wet the film would lie perfectly flat by suction. Mr. PAUL LANGE expressed his intention of taking thirty dozen 5×4 to Norway with him next week, the weight being six pounds instead of half hundredweight, which it would have been if he had taken glass. The President then called upon Mr. John Carbutt, of Philadelphia, the well-known manufacturer of Carbutt's films, who, in passing through Liverpool, had kindly accepted the Secretary's invitation to be present at the meeting. Mr. CARBUTT said that films were rapidly coming into favour with amateurs for outdoor work, because they were now quite reliable. The defects in the earlier films put upon the market were found to be caused entirely by the chemical composition of the celluloid; but, after numerous experiments, this had now been remedied. Mr. Carbutt exhibited some large prints, about four feet by two feet, which had been taken direct upon films with a panoramic lens. He also showed two very ingenious cameras, the "Genie" and the "Henry Clay." Mr. Archer exhibited an apparatus for drying negatives, the "Cytox" hand camera, and the "Eiffel" stand for half-plate camera, weight sixteen ounces. An exhibition of lantern slides followed.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

HELIOCHROMY.—ALBERT SCOTT AND DR. VOGEL.

To the EDITOR.

SIR,—Mr. Albert Scott, p. 345, makes some erroneous statements, which he has made before, and which I duly corrected, but which I must correct again because he has repeated them.

1st. My original demonstration of composite heliochromy with the triple lantern, in February, 1888, was *not* carried out with "red, yellow,

and blue glasses," but with red, green, and blue-violet. 2nd. Three lanterns were *not* employed, but *one* lantern, built expressly for this purpose, with three optical systems close together, and a triple jet, *which is the same arrangement that I use to-day.* 3rd. I did *not* use three slides, but *one* slide carrying the three pictures. 4th. My earlier experiments, as far back as 1881, were with a single sensitive plate for the three pictures, which were made by simultaneous and equal exposure behind three lenses; and that plan I had to abandon as worthless long before I published anything relating to this subject. It fails now in Mr. Scott's hands, as it failed in my hands ten years ago, because the three images, being unlike, will not register on the screen.

Mr. Scott's only original idea in connexion with this subject, is that of a lantern employing a single source of light for projecting several pictures —an ingenious plan, but quite unsatisfactory with the limelight.

Dr. Vogel (p. 351), instead of acknowledging errors which I clearly pointed out in his last communication, makes another false accusation, and fresh errors. I repeat that the Franklin Institute gave Dr. Vogel a full hearing in the matter referred to, through correspondence with Professor Himes, who was one of the most active members of the Committee in charge of the investigation, and very friendly with Dr. Vogel. Dr. Vogel received the statement I have mentioned, and I believe his comments upon it are now on file, with the other papers relating to the case, in the library of the Franklin Institute. Professor Himes signed the report crediting me, not with the "invention of orthochromatic photography," *which Dr. Vogel has good reason to know I never claimed*, but with the publication of the first practically successful method, years before Dr. Vogel announced that he had just "solved the problem" with eosine collodion sensitive plates and the yellow screen, a method that gave inferior results.

Mr. Bothamley's statement of Dr. Vogel's principle will be found in the *Photographic News*, 1887, p. 568, and sustains my statement that he contemplated the use of not less than five separate negatives and colour prints.

The statement that "the method of working with three negatives, claimed by Mr. Ives, is an old one," is something else than merely inexcusable, in view of the statements I have made in each and every paper I have published upon this subject. Facts and references are given in my paper on "Composite Heliochromy," in the *Journal of the Society of Arts* of May 27.*

Dr. Vogel persists in ignoring the fact (which he recognised in a characteristic way at the time) that my method was published in 1888, with particulars of the production of colour prints—two years before Dr. Vogel now claims to have exhibited some colour prints, which, so far as I can learn, were never brought to the attention of the photographic world.

I know very well that the only true complementary colour of any dye is the mixture of light rays absorbed by that dye, and that Dr. Vogel's idea, *according to his own interpretation of the action of colour sensitisers*, represents the use of colour prints exactly complementary to the colour of light which has acted to produce the negatives. Dr. Vogel may assert the contrary, and may find some to accept him as an authority upon this subject, but that will not alter the facts.

Dr. Vogel has a right to quote, and spread, and commend the only unfavourable expression of opinion of my lantern projection process he has been able to find in print, and to ignore the heliochromoscope altogether.—I am, yours, &c., FRED E. IVES.

London, May 30, 1892.

MR. LYONEL CLARK AND THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

To the EDITOR.

SIR,—I notice in a report appearing in your columns that I am mentioned as being the examiner who set the question in the last examination paper of the City and Guilds of London, as to the best means of ascertaining when a silver print is properly fixed. Will you permit me to point out that, although appointed to the post, my duties in connexion therewith do not commence until the ensuing season, and that therefore I had nothing to do with the setting of this very practical question that has aroused so much interest.

I mention this fact, as the Society in question wrote to me saying that the query had been put at one of their meetings and had been referred to me, but not stating or in any way showing that they were addressing me as the examiner who had set it; and indeed it was only from a perusal of your columns that I discovered the existence of this erroneous impression.

The matter has become slightly complicated from the fact that, believing I was written to as a private individual who had given some attention to the subject of printing in salts of silver, I was very pleased to give the results of my experience in this branch of the subject to the Society, and accordingly sent them a few rough notes on the subject.

If these notes should come before the eyes of any of your readers, they may, under the erroneous impression that I was the examiner answering his own question, give them an official *cachet* which they do not possess, and I should be glad to avail myself of the opportunity offered by your columns to state that these are my private opinions, given without the knowledge that the question had ever been publicly asked in the Guild's examination, but merely put forward to be of what benefit they might to my fellow-photographers.—I am, yours, &c., LYONEL CLARK,

11, *Victoria-street, London, S.W.*, *Hon. Librarian, Camera Club.*

May 25, 1892.

* Mr. Ives' paper, to which reference is here made, will be found on page 357, *ante*.—ED.

PHOTOGRAPHIC LENSES.

To the EDITOR.

SIR,—There is an omission in the report of the discussion on the *Concentric Lens* at the Society's rooms on May 24.

I was stated to say that "one of the greatest difficulties in the construction of photographic lenses was the cure of colour." I said "the cure of *spherical aberration* with colour." This, known as "under-correction," is associated with a degree of positive aberration that cannot be separately corrected in a telescope, which must ever remain faulty, unless all colour is eliminated.

On the other hand, in the photographic lens with the presence of this colour, irrespectively of which we can correct spherical aberration alone, by varying the thickness of the glass, or by an adjustment of the distance of the component lenses of the system, we can thus obtain a surprising degree of distinctness in the image, that almost equals telescope definition. —I am, yours, &c. F. H. WENHAM.

DEPTH OF FOCUS.

To the EDITOR.

SIR,—It is a matter of surprise that a gentleman of Mr. F. H. Wenham's more than European reputation should write setting up a claim for "Depth of Focus" for a particular lens, thus practically asserting the insufficiency of the formulæ in the text-books, which give only the aperture and focal distances as factors, without being prepared to show that a difference in this respect between two otherwise similar lenses is at least possible.

In the discussion which took place on Tuesday, the 24th inst., Mr. J. Stuart admitted that for central rays the lens in question possessed no greater depth of focus than any other corrected lens, and that it was impossible it should have. He, however, still claimed that the marginal rays being better defined than with other lenses, there was a greater distance within which a certain sharpness could be obtained. This comes within the case of the possible apparent exception referred to in my former letter, and is more properly described simply as better marginal definition.

It is to be hoped that the present incident will do something towards expediting the extinction of the fancy, once cherished by many photographers, that depth of focus is a quality existing in some lenses more than others, independent of equality in aperture, focal length, and fineness of focus, or absolute defining power.—I am, yours, &c.,

May 30, 1892. W. E. DEBENHAM.

PHOTOGRAPHIC PRINTERS.

To the EDITOR.

SIR,—Your correspondent, "Unfortunate," complains of not being able to find a situation to suit him, and as I am *another* unfortunate who has not been able to find a printer to suit me, I thought that a few remarks from a brother in distress might not be devoid of interest.

First of all, I shall be glad to give immediate employment to "Unfortunate," promising him a permanency, moreover, if he will but print me one dozen albumen prints or whatever order he has, from each negative *alike* in depth and colour, is able to vignette well and ensures perfect fixation and subsequent conscientious and careful washing in repeated changes of water. To such a workman I shall be ever grateful, and I further promise your correspondent, and you Mr. Editor, that I will report progress to your readers after a trial for a month or two, endeavouring to be just to him, the public, and myself. I may say that I had one printer who served his apprenticeship with me, after which he *remained* for several years (seven in all), a better workman could not be found. Before and after this, my unfortunate experiences with printers were such as to make me often give way to a sinful longing for a land were everything is toned and fixed by spiritual agency. I have written enough on this subject in the pages of this JOURNAL and its ALMANAC, (see ALMANAC 1888, page 336), to show that there are two sides to this question, and I am sure a majority of employers will support my statements.

Any "unfortunate," who is not afraid of work and able to cope with an ordinary amount of work, changing each print when done and not waiting till the whole batch is completed, may be sure to find employment, but I am emphatically of opinion, that the peril lies in *keeping* the same. If printers would bear in mind that it is the result of their labour which passes directly into the hands of the customer, and that they have it in their hands to make or break a business if left to themselves, things might be different.

At the present time there can be no doubt, however, that the supply exceeds the demand, but I do not think this would be the case if printers would look upon themselves as skilled workmen and not as automata.—I am, yours, &c., J. HUBERT.

N.B.—I have always found vacancies advertised in your JOURNAL.

May 30, 1892.

To the EDITOR.

SIR,—I notice in your last issue a letter from a photographic printer complaining that he cannot get work, and you seem rather to endorse the view that that class of work is hard to obtain. Of course, it is difficult in any trade for a man to obtain work unless he be both smart and energetic; but the number of applications that we get for smart platinotype printers proves conclusively that a good man need never be out of employ.

Of course, if a man is content to stick to silver printing and antiquated processes of that kind, he cannot expect to keep his head above water. But the demand for really good workers is enormous; at the present moment we are are asked to send a good man out to Philadelphia, and the writer states that he could find places for dozens of good platinotype printers; but, out there, a man must not only be a good worker, but must be pushing and able to move with the times.

It is as true, in the photographic trade as in every other, that no good worker need ever be out of work; it is only the incompetent or the lazy who get left in the race of life.—I am, yours, &c.,

The Platinotype Company, ERNEST J. HUMPHERY.
29, Southampton-row, High Holborn, London, W.C., May 31, 1892.

CORRECT EXPOSURES.

To the EDITOR.

SIR,—I was expecting that a better optician than I can claim to be would reply to Mr. Michael's letter on this subject on p. 335, but as no such answer has appeared, I venture to give the result of my experience.

It is by no means strange that the facts referred to (the amount of subject included on the plate), should be omitted from different systems for calculating exposures. The plain fact is, that this factor, as regards any influence upon the time of exposure, has no existence outside Mr. Michael's imagination.

In the first place, look at the question from a practical point of view. I carry with my 7½ × 5 camera, four lenses, of 7½, 9, 10, and 12 inches focus. I have often taken photographs from the same point of view, with the 7½ and 12 inch lenses within a few minutes of each other, giving the same exposure with apertures which have the same ratio to the focus (*f*-22 for instance). In no case have I found that the wide angle picture had received a greater exposure than the other. I think most practical photographers will bear me out in saying that we may safely accept the opticians' statement that, for all practical purposes, the statement of the ratio of aperture to focus, gives all the needful information regarding the rapidity of a lens.

Even the absorbing and reflecting capacity of the glass has, I think, less influence than some think, and I have failed to discover that a single lens with, say, an aperture of *f*-16, requires less exposure than a doublet lens with *f*-16. A few months ago I made some definite experiments in this direction.

I set up a white reflecting screen in a room illuminated by steady sky light. I fixed a camera at such a distance that the widest angle lens would not include more subject than the white screen. I then exposed four plates with four different lenses, each for three seconds with *f*-16 (as marked by the opticians), taking care that each lens was worked at its correct focus. I afterwards measured the opacity of each negative with Captain Abney's photometer, and give the results.

Lens.	Focus.	Aperture.	Opacity of Negative.
Wray Single	10 inch	*f*-16	7
Beck Rectilinear	9	*f*-16	7¾
Taylor Doublet	5	*f*-16	7¾
Ross Portrait	3½	*f*-16	7½

The negatives were developed in the same dish, with the same developer, for the same period of time.

I was afterwards curious to compare the exposure given by a simple aperture (no lens) with that of a lens. I therefore exposed a half inch diaphragm at eight inches (*f*-16) for six seconds, and directly afterwards a Beck Rectilinear at *f*-16, under similar circumstances as before, and carefully measured the opacities of negatives. They were: simple aperture, thirty-six; and Beck lens thirty-five, practically identical. To return to the original subject. The fallacy of Mr. Michael's argument is, in assuming that a large amount of subject will transmit more light to the plate than a small amount. Neither theory nor practice supports this.—I am, yours, &c., ALFRED WATKINS.

Hereford, May 28.

STAINS ON PRINTING-OUT PAPER.

To the EDITOR.

SIR,—With reference to the letter of the Britannia Works Company in your last Friday's paper on the above subject, I may say, first, that it is a mistake to suppose that I complained about the prints toning slowly, as the first lot toned so quickly that I could not tone more than three at a time without over-toning; even the last lots have toned twice as quick as ordinary sensitised paper. What I complained about was the poor tone, and the stains in all but the first lot, although I used my usual toner—eighty grains borax and one grain gold—until advised to use more by the Britannia Works Company. I always use fresh solution each time; secondly, I must admit that my monogram on the paper I sent was not as plain as might have been, therefore I think there is no necessity for the Company to apologise to me for not being able to read it; thirdly, the pieces of paper referred to in my last letter have arrived, and are free from stain, and the tone is good; fourthly, it may be ignorance on my part, but I must say I do not agree with the Company that the stains are caused from want of gold, or why should not the marks be all over the paper; and why do they come in the printing before they have been near the toner?

I think, instead of the Britannia Works Company apologising to me for not being able to read my monogram, it is my place to apologise to the Company for not having acknowledged the receipt of the prints in your paper of Friday last.—I am, yours, &c., W. ALFRED MEIOH.

Ash Hall, Stoke-upon-Trent, May 30, 1892.

BROWN TONES ON OPALS.

To the EDITOR.

SIR,—For some years I have been invariably successful in making gelatino-bromide emulsion for coating opals, giving very pure black tones. I have recently made three lots, and each one gives me a *warm sepia* tone. The chemicals are Johnson & Sons, carefully weighed; the gelatines, Nelson's No. 1 and Heinrich's. Can you, sir, give me the cause of the brown colour, and how to avoid it? If you could briefly give me a good formula, I should be obliged. There is nothing on the subject in the last five or six ALMANACS. The gelatines have been kept in a dry cupboard since October, so I cannot suppose that any deterioration has taken place, and the ammonia bromide, ammonia iodide, and ammonia chloride are from the same stock I used successfully in the winter. I used ferrous oxalate developer, and no matter how much under or over exposed, I can get no other colour than brown. The pictures I now get are fine enough, but I am altogether puzzled with the remarkable change of tone.—I am, yours, &c., H. BARRY.

Bridge-street, Chester, May 21, 1892.

REMOVING SILVER STAINS.

To the EDITOR.

SIR,—In your last issue you ask for experiences with an American formula for removing silver stains. About a week previous I had seen the same formula in G. Mason & Co's *Photographic Guide*, accredited to Daniel Robertson. Having by me a negative which had been silver stained two or three days before, I tested the process. Immersion for from five to fifteen minutes was said to be sufficient. I found that thirty minutes in two freshly made baths failed to remove the stain. No apparent reduction in the image took place, nor was the silver in the stain removed, but the objectionable red colour was gone, as also the yellow stains from pyro development. The negative now resembles one produced by eikonogen. It would appear to be hopeless to expect any agent to remove the light reduced silver of the stain without attacking the developed image.—I am, yours, &c., J. MCINTOSH.

14, *Lowman-road, Holloway, May* 24, 1892.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Will exchange three showcases, two feet by three feet, for 8×8 backgrounds or accessories.—Address, H. E. WATKIN, Grand Studio, Marine Parade, Scarborough.

Wanted to exchange THE BRITISH JOURNAL OF PHOTOGRAPHY for 1890 and 1891, for a quarter or half-plate rapid rectilinear lens.—Address, E. BALLEY, 44, Lime-grove, Bideford.

Whole-plate portrait lens, by Shepphord, will exchange for rectilinear or cabinet also print-washing apparatus, exchange studio accessories.—Address, S. J. GANNON, Chelmsford.

Lancaster's quarter-plate Instantograph and three dark slides, also a hand camera to carry twelve 3¼×2¼ plates, in exchange for a half-plate camera, or a good quarter-plate hand camera.—Address, F. HOLWILL, 44, Lime-grove, Bideford.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

E. BARBEN.—A distinct trace of iron in the water would doubtless produce such a stain.

B. J.—Both formulæ are published by the Company. Probably you had better employ the later one issued.

E. A. CARNELL.—No photographic exhibition to be held at the Crystal Palace this year that we are aware of.

W. COX.—Probably a trace of iron was left in the prints, notwithstanding the careful manner in which you appear to have cleared them.

G. G. BAGSTER. We should be pleased to receive the communication. We described the result of M. Lippmann's latest experiments a few weeks ago.

R. WALTON.—From the fact that a very large number of plates are daily sent abroad, it may be fairly assumed that they are fully appreciated by some foreigners at least.

BECCLES.—If all the plates turned out well with the exception of those you changed in that particular dark room, it would seem to indicate that the light was at fault. The light in hotel dark rooms, as we have said on former occasions, is not always to be relied upon.

C. WHITEHOUSE.—The pier companies and the proprietors of gardens and parks can, of course, lay down their own conditions as regards taking photographs on their property. But in the case of piers it is petty to extract heavy fees, if, indeed, it is not a mistaken policy, as few persons will pay them.

R. A. BROOME asks where china plaques for vitrified photographs are to be obtained.—We believe they may be had from most of the Staffordshire china manufacturers. Mintons and Brownfields, we think, both supply them, and they have London offices, which will be found from the Directory. Mortlocks, if we mistake not, also supply them.

W. A. J.—If the paper turns brown a few hours after being sensitised, while two other samples floated on the same bath keep good for two or three days, it shows that there must be something wrong with the paper. The addition of nitric acid to the solution might improve matters, but then it would probably not work well with other papers.

A. C. C. has been essaying the wet-collodion process, and sends us a negative for our opinion, as he has not a negative by that process with which to compare his work.—The negative is a very poor specimen indeed. It is fogged and streaked, as well as slightly stained in development. The bath is out of order; try the effect of an addition of one or two drops of nitric acid.

F. THOMAS says: "When enlarging, it makes my eyes go very red all about them, and I attribute it to the red or ruby-coloured glass, which seems to have a strain on one's eyes. What would prevent this? Would using blue spectacles in the enlarging room prevent it (the strain on the eyes), or what do you recommend?"—Probably a shade would be a sufficient protection.

S. Y. complains that he has taken a dozen cabinet prints from different batches, and cut them in half. One-half he has mounted on cards recently received. At the end of a month the mounted halves show spots, while those kept unmounted are quite perfect. He wants our opinion.—It is this: It is clear that the evil is due either to the cards or the mountant. We cannot say which.

MESSRS. MCGHIE & Co., of Glasgow, write: "We notice, in answer to a correspondent, you state that 'Monckhoven's tissues or films are not obtainable.' We would respectfully inform you that we have a large stock of the different colours, and the demand for this class of paper is increasing. The same remarks apply to a query you answered some time ago regarding photo-mechanical papers."

BEGINNER.—The fault in the prints is that the negatives are much under exposed. The professional who made the print is quite correct when he says it is impossible to get better prints from such negatives. You say the shutter you use is the best and quickest that is made. Quite so, and probably that is the cause of the trouble. It has been set to work too quickly for the plates. It is easy to obtain rapid working shutters but not so easy to obtain plates sufficiently sensitive to respond to them, particularly when used by a novice.

VICTIM says: "About a fortnight ago I sent my photograph (cabinet size) to a firm, in answer to an advertisement for an assistant, and they have not returned it. I wrote to them last week and asked them to return it, and they sent reply to say they thought they had returned it, but if they find it laying about they will send it to me. That seems to me rather unbusinesslike. Is it a firm that is on your black list? I have enclosed the name and address of the firm mentioned, and also my own, but not for publication."—The firm named is, we believe, a respectable one.

C. A. S. asks, I, if the owner of a racing yacht can prevent any one from taking a photograph of it when the vessel is in the open sea. 2. Now, yachts are photographed in full sail when competing at regattas. Whether are they taken with long-focus lenses from the shore or from another boat?—In reply: 1. No; certainly not. 2. The way yachts are usually photographed is this: The camera is on board of another vessel, usually a steam tug or a steam launch, the vessel steaming in the same direction, and at about the same speed, as the yacht is going. It is by this means that the sharpest yacht pictures have been obtained.

C. MARTIN says: "I have just purchased an old lens of Voigtlander's make, about the half-plate size. On the inner tube there is an engraved scale, the divisions being about the sixteenth of an inch or a little more. Can you tell me what is the use of it? I have not yet tried the lens, as I have not a camera to take it."—Apparently the lens is a very old one, and the visual and chemical foci are not coincident. The divisions on the scale indicate the amount of alteration that is necessary to be made after the image has been focussed in order to obtain a sharp picture.

G. L. says: "Just before Christmas last I sent a negative to a firm to make me one 12×10 enlargement, and finish in oils ('paper'), enclosing postal order for same. About a month after I received the enlargement, but, owing to the likeness having been destroyed, I returned it at once for alteration, and, in reply, received a request to send the negative again, as they could do nothing to improve the likeness, and therefore wanted to make another enlargement. Up till now I have neither received enlargement nor can I get any answer to repeated letters asking for an explanation, and my clients now say they will not take it, as I have disappointed them so often. Can I take any proceedings to recover the amount paid and the loss I shall sustain on the order? I may state the enlargement was not promised for any time, but I think four months quite sufficient."—To ensure the return of the negative, we should recommend you to communicate with the local superintendent of police. As to whether you could recover damages for the non-delivery of the enlargement, a solicitor's opinion would be your best means of ascertaining.

RECEIVED.—W. J. Stillman, Albert Levy, Mortimer Field, and W. Borough. In our next.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—Tuesday, June 7, *Retouching*, by Mr. Redmond Barrett, at 8.15 p.m. Visitors are invited.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—June 9, Members' Open Night, 16, *Some Prime Factors in Exposing*, Mr. Howard Farmer. 23, Annual General Meeting.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.—Joint Outdoor Meeting, Newcastle Photographic Association and Hexham Photographic Society, to Stocksfield on June 16. Train leaves Central Station, Newcastle, at 9.60 a.m. Leader, Mr. J. P. Gibson.

PHOTOGRAPHIC CLUB.—June 8, *Dodging Negatives for Printing.* 15, *Platinum Possibilities.* Bank Holiday outing next Monday to Gomshall and Shere. Train from Charing-cross at twenty-eight minutes past nine; London Bridge, thirty-five minutes past nine. Train does not stop at Cannon-street.

STOP THIEF!—The Eastman Company write us that a No. 4 registered Kodak, numbered 7806, was, on the 31st May, 1892, stolen from the counter in their shop. They ask our assistance in the hope that the camera may be offered to one of our readers, who would no doubt be willing to help them in the detection of the thief.

MESSRS. J. LANCASTER & SON'S 1892 catalogue should be invaluable to amateurs, as it includes particulars of the firm's innumerable productions in the way of apparatus and sundries for the prosecution of the popular art. It may, indeed, be truly said that both rich and poor will find in these handsome and well-illustrated pages every opportunity for satisfying their requirements. The amateur who is without Lancaster's catalogue cannot claim to be up to date.

MARION'S PHOTOGRAPHIC PASTE.—Messrs. Marion & Co. have sent us a bottle of a new paste introduced by them for mounting prints. Its nature and uses will be amply ascertained from the label, which instructs us to "lay the print to be mounted face downwards on a clean surface, and paste evenly with a hog-bristle or indiarubber brush. When thoroughly spread, place the print on the mount and press well down with a pad of clean blotting-paper, pressing out all air bubbles."

CHICAGO EXHIBITION, 1893.—The Royal Commission have appointed a Photographic Committee, consisting of Captain Abney, Francis Cobb, James Dredge, G. Davison, Colonel J. Gale, H. P. Robinson, and Sir Henry Trueman Wood, to form a collection of photographs representative of the best work which is now being done in this country, both by amateurs and professionals, for the photographic department of the Chicago Exhibition. The pictures lent for this purpose will be transmitted to Chicago and brought back thence free of charge to the exhibitors, and the Royal Commission will also undertake their care while they are in the exhibition. The Committee propose to send an invitation to a limited number of photographic artists, and hope to be able to get together a collection which will be worthy of the present advanced condition of photographic art in England. Pictures will only be received from those to whom invitations have been addressed. In addition to this selected collection, there will be many photographs sent by exhibitors at their own cost, and for these space will be allotted in the usual way.

**** Several contributions and answers to correspondents are unavoidably held over.*

CONTENTS.

THE BRITISH
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THE FIXATION OF SILVER PRINTS.

The question raised before the London and Provincial Photographic Association as to the possibility of testing otherwise than by ocular observation whether a print is sufficiently fixed or not is one of the very highest importance, more especially where large numbers are manipulated at one time. In dealing with a small number, it is perfectly easy, by employing a sufficiency of solution, and moving them about for a given time, so that the bath has free action upon each, to ensure that all are thoroughly cleared of all unreduced silver chloride and albumenate; but when very large numbers are worked at once, as in professional establishments, it is not so easy to give to each one the same individual care. Not only is there a tendency to curtail the quantity of solution used, but the very fact of their numbers precludes the possibility of turning them over so thoroughly or of preventing their massing together so as to cause irregular action of the hypo.

This is a prolific cause of imperfect or irregular fixation, and, while an obvious remedy exists in increasing the bulk of the solution and exercising care that each individual print is submitted to the full action of the bath for a proper time, no practical test appears to be available of the thoroughness of the treatment; and, if such did exist, it would have to be applied to each single print, with the result that those that were not completely fixed would be spoilt at once, instead of remaining to fade with more or less rapidity. The plan adopted in many large establishments of employing two separate baths, and removing the prints one by one from bath to bath, seems the most likely method of ensuring the perfect action of the solution; but this necessarily involves time, and is therefore liable to be shirked by the apprentice or assistant to whom such work is usually relegated.

We have said that no test appears to be available, because it is obvious that a print freshly removed from the hypo bath must contain a certain proportion of silver compounds in the soluble condition, although it may be perfectly fixed, that is to say, may have had all the silver chloride and albumenate dissolved. Consequently, before such a print can be tested for insoluble compounds, it must be freed by perfect washing from all the soluble decomposition products of the operation of fixing. And here we may point out that some misapprehension seems to exist as to the terms "imperfect fixation" and "imperfect washing." The original question put by the examiner may have *meant* either one or the other, but the members of the London and Provincial Association were undoubtedly correct in reading it in its literal sense as referring to the action of the fixing bath alone.

A print may be turned out in three separate states. It may be imperfectly fixed but perfectly washed; or, *vice versâ*, thoroughly fixed but insufficiently washed; or, again, neither operation may have been thoroughly performed. In the first instance, it will contain insoluble silver chloride and the practically insoluble sodio-silver hyposulphite; in the second instance, it will contain soluble hyposulphite of silver and soda, together with chloride of sodium and hyposulphite of soda; while, in the third case, it will contain the whole of these materials, both soluble and insoluble. Obviously, each class of print will require different treatment in testing, and in the case of the perfectly fixed print alone can any really efficient test be applied. Starting with the understanding that the whole of the unreduced silver compounds, chloride and albumenate, have been brought to the soluble condition by the full and free action of a sufficiently strong hypo solution—which means that they have been converted by the hypo into the soluble form of sodio-silver hyposulphite ($Na^4Ag^2S^6O^9$), together with chloride of sodium—all that is required for their removal is plentiful washing in repeated changes of water, and a suitable test applied to the washing water will indicate when the whole of the hyposulphites have been eliminated. Of these tests there are many of greater or less delicacy, and the one test will apply to the full batch of prints.

But when, from the use of too weak a solution, too short an immersion, or the adhesion together of the prints in the dish, the prints are insufficiently fixed, the most perfect washing possible will leave behind the insoluble double hyposulphite of soda and silver ($NaAgS^2O^3$), together with, in all probability, unacted-upon silver chloride and albumenate. No test applied to the washing water is of the slightest value under such conditions, as the impurities remain in the prints themselves to which the tests must be applied, with the result, already mentioned, that they are at once spoiled by the formation of sulphide of silver, itself unremovable by any known agent that will not destroy the paper.

In the case of a large batch of prints, then, that it is desirable to test for sufficiency of fixation, the only practical plan appears to be to select a single print hap-hazard and submit it to the test for silver and hyposulphites, and, if it be found wanting, to pass the remainder of the batch through a freshly made bath of hypo, when, if ordinary care be applied, it is difficult to imagine that they can be anything but thoroughly cleared, and a thorough washing will place them in a condition of safety. The original carelessness, then, involves merely the loss of a single print and the expenditure of a little more time and material. It must be observed that no test is applicable until the prints have been thoroughly washed; or, rather, that the test for thorough washing must be satisfactorily answered before that for fixation is of any use, because, so long as any soluble hyposulphites remain, they will respond equally with the insoluble.

The next question that arises is as to the test to be applied.

Mr. Lyonel Clark in his article mentions potassium bichromate, which he states is employed for testing whether paper is sufficiently sensitised—an application, we may remark *en passant*, we have not previously heard of, and the value of which seems dubious. Its use for the purpose under discussion is, however, perfectly valueless, as was mentioned at the meeting of the London and Provincial Photographic Association, since a print *that had not been fixed at all*, if thoroughly freed by washing of its soluble silver nitrate, would fail to give any reaction with the chromate. It is possible that it might react with the insoluble double hyposulphite of soda and silver, if that were present in a print; but, even granting that, the silver chloride would be beyond the test, and might be present alone.

The alkaline sulphides also mentioned by Mr. Clark are undoubtedly efficient for the purpose, forming most delicate tests for silver either in the soluble or insoluble form; but, as Mr. Clark suggests, these reagents would most probably be *too* delicate, and, by acting upon the image itself, especially in its more delicate portions, give a false character to the print tested. On the whole, therefore, we should incline to reject that method of testing.

The double hyposulphite of soda and silver is, however, very soluble in various reagents, including hypo itself, ammonia and other alkalis forming extremely sweet solutions, as any one may prove by letting a drop from a newly fixed print fall on the tongue. These solutions, if tested with a soluble chloride, give a silver reaction, owing to the superior solvent power of the substances named, especially hypo, but, if in a sufficiently concentrated condition, iodine or a soluble iodide, will form a precipitate, owing to the lower degree of solubility of the iodide of silver. A suspected print might, therefore, be boiled or digested in a small quantity of water containing a little ammonia, and the solution tested with iodine, or a drop of ammonia or solution of soda or potash be dropped on the print, and afterwards a drop of solution of iodide of potassium, when a yellow stain of iodide of silver would be formed. This method would perhaps be scarcely delicate enough in most cases, so an alkaline sulphide dropped into the solution, in which the print had been digested, would give a precipitate of sulphide of silver, an indication that would be free from the objection raised against its application to the print itself.

In very bad cases, or where it is suspected that the prints have adhered together in the fixing bath, simple immersion in a solution of iodide of potassium would betray the presence of any considerable quantity of either chloride or insoluble double hyposulphite of silver by converting them into silver iodide, easily recognisable by its yellow colour; and this plan possesses the advantage that it would have no ill effect on the print, since the iodide of silver could be easily removed by reimmersion in a fresh bath of hypo. In this it would seem we have a practical test, to which the whole of a suspected batch of prints might be submitted without injury, though the indication in slight cases would be perhaps very faint.

Alum solution forms another fairly delicate test, though it produces a permanent precipitate of silver sulphide, and is therefore only applicable to a selected print. Its action is to decompose the hypo and precipitate the silver in the form of sulphide, while further indications of the presence of the hyposulphites are given by the odour of sulphuretted hydrogen and sulphurous acid given off.

Finally, the hyposulphites of silver, both soluble and insoluble, are readily decomposed by heat and converted into sulphide. Hence, dipping a suspected print into boiling water or heating it in a weak alkaline lye would, by the production of the characteristic brown discolouration, reveal the presence of the enemy.

These seem to be the most feasible methods of testing the fixation of prints, and, if they are not as effective as could be wished, perhaps some benefit may accrue from a recognition of the difference we have pointed out between imperfect fixation and insufficient washing.

YELLOW SCREENS FOR ORTHOCHROMATIC WORK.

It is obvious that the employment of the yellow screen in orthochromatic photography opens up at the outset the question as to the choice of a tint for particular classes of work, so that in the resulting negatives the relative colour values of the subjects are rendered with uniform accuracy. For instance, a subject, rich in bright blues and very subdued yellows and greens, might require a screen rather deeply stained, in order, while effectually cutting off the blues, to allow the other colours to assert themselves sufficiently in forming the image. Reversing those conditions, however, the necessity of employing a deeply-tinted screen disappears, and hence a light screen might be used, to the advantage, of course, of considerably shortening the exposure.

The foregoing examples tend to show that, where a photographer engages in orthochromatic work constantly, the variations in the relative and particular colour values of the subjects he has to reproduce require that he should provide himself with a number of screens of different intensities of colouration. Practically, however, we believe that a large number is unnecessary, for a little reflection will show that, say, five differently coloured screens are susceptible by combination, according to the requirements of circumstances, of being so utilised as to constitute a much greater number of screens of varying depth of colouration.

We have been asked this week by a correspondent to give him some idea of the method employed for colouring the pellicular structures used so much abroad as colour screens, and also to inform him of the means he should take for preparing the pellicles of different, and at the same time of regularly increasing, depths of tint; and, as the matter may possibly be of interest to many of our readers, we embody our reply in the form of a short article. We are aware that considerable variety of opinion prevails as to the advantages or disadvantages of the yellow screen with orthochromatic plates, into which controversy, however, we have no present intention of entering.

To the late M. Boissonas, we believe, is due the following plan, which we outline as briefly as possible, of making two solutions provide no less than four screens, increasing in intensity in the order of their enumeration, and equally so prolonging the necessary exposure in a like ratio. Experiment led him to determine that with what he called No. 1, or a faint yellow-coloured screen, the exposure of the orthochromatic plate, which, without a screen, was unit or one, was increased by that screen from $1\frac{1}{2}$ to 3 times, according to the intensity of the light; No. 2, a darker screen, increased it from 3 to 6; No. 3, still darker, from 4 to 9; and No. 4, from 6 to 12. The preparation of the coloured pellicle was conducted as follows:

Four sheets of good glass, of the size thirteen centimetres by eighteen, were coated with a thin film of wax in benzole, applied with a clean fabric, dried over the heat of a spirit lamp, and the surface slightly polished. When quite dry, an edging of benzole was given to the plates, which were then coated with

a plain collodion containing 2 drops of glycerine per 100 c.c. Two solutions were then prepared: No. 1, the colouring solution, consisting of white gelatine, 7½ grammes; glycerine, 1 c.c.; distilled water, 95 c.c.; phenique acid, 2 drops; and 5 c.c. of a half per cent. alcoholic solution of aurantia; solution No. 2 consisting of 7½ grammes of white gelatine, and 1 c.c. of glycerine in 100 c.c. of distilled water. In each case the gelatine was dissolved first and the other substances added afterwards, the two solutions being well filtered and kept at a temperature of 120 F.

For the first or lightest tint 10 c.c. of the colouring solution were mixed with 30 c.c. of solution No. 2, and applied to one of the collodionised plates. The second or darker tint consisted of 20 c.c. each of the two solutions; No. 3, of 30 c.c. of the colouring solution and 10 c.c. of the gelatine solution; and No. 4, simply of 40 c.c. of the colouring solution alone. Thus the depth of colour is in the inverse proportion of the dilution of the colouring solution with the plain gelatine. When the films are perfectly dried, they are each coated with another film of collodion, and finally stripped from their supports.

The films of coloured gelatine so prepared are adaptable for employment in the diaphragm opening of the lens, being secured within small discs for that purpose; equally so they can be applied to optically worked glass, and used in the ordinary way. Collodion alone gives a thinner film than gelatine, and screens of the tints above specified are prepared by dissolving one gramme of aurantia in 100 c.c. of plain collodion for the colouring solution and mixing five c.c. of it with fifteen c.c. of an uncoloured solution, and for the other tints, respectively, ten c.c. of each, fifteen and five c.c. of each, and twenty c.c. only of the coloured collodion solution.

We believe that coloured gelatine and collodion films for orthochromatic work are articles of commerce on the Continent where they are in extensive use; and probably the information as to their preparation here given may be of service to the increasingly large number of people who are taking up orthochromatic work, and find that as much attention has to be given to the properties of the screen as to the plates themselves.

Photo-Technical Education at Home and Abroad.—At the Photographic Society of Great Britain's next meeting on Tuesday, June 14, Mr. E. Howard Farmer will read a paper on this subject, in which he will compare the teaching (and the results of the teaching) in photo-technology which has been given in England with that given on the Continent. As the statement made at a meeting of the Society, "that there was no place in England where photo-instruction could be obtained," has done the Polytechnic School of Photography serious injury, Mr. Farmer is anxious to make the subject of his lecture as public as possible.

Collecting Fine Precipitates.—Some years ago, in renovating by nitrate of baryta an old bath, we took some trouble in collecting and examining the small quantity of precipitate produced by the baryta. From a Winchester solution we obtained a very minute precipitate which was very troublesome to collect. Mr. W. H. Barber, in the *Chemical News*, proposes a very neat way of dealing with such difficulties. He recommends the addition of finely divided asbestos to solutions containing a troublesome precipitate, and the collection of the whole on an asbestos plug. The precipitate may then be washed, redissolved, and estimated with great ease.

Ammonia as a Fixing Agent.—The evanescent character of silver is primarily attributed to the hyposulphite of soda used for fixing, or the hyposulphite compounds formed during the operations and their imperfect removal in the after-washing. Indeed directly, or indirectly, "hypo" is made, and not without cause, the bugbear of fugitive silver prints. Now, it may not be generally known to a great number of modern photographers that ammonia is a very good fixing agent, the unaltered by light chloride of silver being freely soluble in that menstruum. In olden times it was frequently used in that capacity. The unfortunate thing in connexion with ammonia as a fixant is that it cannot be used with albumenised paper, inasmuch as it dissolves the albumen. There is no reason, however, why it should not be employed for plain paper, as by its use no hyposulphites—if they be the cause of fugitiveness—could be formed. Those who are working with plain paper might give it a trial. It need scarcely be remarked that ammonia is by no means an agreeable material to work with; but some might be inclined to overlook that fact if permanence were ensured.

Action of Light on Sulphite of Silver.—In a recent number of the *Chemical News*, Mr. W. H. Sodean relates some experiments with regard to this action of light which have a decided photographic interest. The salt was prepared by passing sulphurous anhydride into a solution of recrystallised nitrate of silver, washing the precipitate thoroughly, and completely desiccating by keeping it in a vacuum over a mixture of sulphuric and chromic acids. When kept in hermetically closed tubes it was slightly blackened after a fortnight's exposure to sunlight. When the temperature was raised the blackening was more intense and more quickly brought about. It was noted also that when moisture was present the darkening was accelerated. This latter effect might be anticipated, for it is well known that many familiar gaseous reactions are absolutely impossible when the gases before mixing and the containing vessels have been rendered perfectly free from water vapour. Quite recently, for example, it has been shown that sulphuretted hydrogen gas, so fatal to silver prints and injurious to silver articles, is quite without action upon silver and other salts when quite dry.

Ordnance Maps.—It will be remembered that in June last a Departmental Committee of the Board of Agriculture was appointed to inquire into various points in connexion with the Ordnance Survey of the United Kingdom and report thereon. That report has recently been presented to Parliament. From it we learn about that 2400 persons are now engaged in the different branches of the survey, a very large proportion of them being the military—the Royal Engineers. The most important work the Office now has on hand is the completion of the twenty-four-inch scale maps. It is interesting to learn from the report, thanks to photography and photo-zincography, that the sale of the maps to the public now pays the expense of publication. This will, no doubt, be surprising to some who have had the opportunity of seeing the work in progress at Southampton, and the time and care expended upon it; and, without this, it would be impossible to produce the excellent results issued. Few commercial houses, we imagine, would find it remunerative to bestow the same amount of time on their work as that expended upon that at Southampton.

Albumen and Sulphur.—The connexion of these two bodies has a close bearing upon the most familiar form of silver print, and Herr Rosing has discovered the singular fact that, when an emulsion of pure sulphur is mixed with egg-albumen, a decomposition takes place. The albumen is oxidised, a hydroxyl group derived from a molecule of water replacing a hydrogen atom in the albumen molecule, whilst the displaced hydrogen atom unites with the remaining hydrogen atom of the water molecule and with an atom of sulphur to form sulphuretted hydrogen. This action, however, does not take place when no water is present, nor when neutral salts capable of combining with water are present, nor when the albumen has been previously with iodine or other substances. Now, it is evident, that in a print in which toning takes place by "sulphurisation," we have conditions very similar to these—albumen and sulphur in a fine state of division brought into close contact, with a probability of the gradual production of sulphuretted hydrogen, its gradual oxidation to sulphuric

acid, and the destruction of the print. The question that arises is, whether the albumen has been previously hydroxylated during the various processes it has passed through.

Chromo-Photography.—The controversy with reference to chromo-photography and Mr. Ives' recent demonstrations does not seem to be confined entirely to the technical press, for Dr. Vogel had a long letter in the *Standard* on the subject of his own investigations and that of others many years ago. Other letters on the subject have also appeared in the lay press from other writers. Now every one in this country is always anxious to give credit to whom credit is due, whatever may be their nationality. There is another phase of the question that appeals to the more practical portion of the public, namely, the commercial value of the results. Mr. Ives has shown photographs in colours on the screen, and described the methods by which they were produced. Dr. Vogel's work lies in a different direction, though on the same basis—that of producing chromo prints by printing from three plates made from three negatives; that is, pictures in all the colours of nature with three printings only. So far as we are aware, none of the Doctor's recent examples have reached this country as yet. But we are informed by a friend who has had the opportunity of seeing them, and who is fully qualified to judge, that they are far and away the best results in this direction he has hitherto seen; and he is quite familiar with the best that have been shown in this country.

Stains on the Margins of Plates.—A question was recently put at one of the metropolitan Societies, as to whether stains at the edges of a plate were to be taken as a proof that the plate was an old one. Any answer to this question ought only be given with a qualification. A plate may be old and yet show no stain, or one may be comparatively new and yet show a marked stain. We recently worked with some plates which the date upon the box showed had not been made a year, yet they had a strong iridescent stain encroaching well into the plate; while, a short time back, we developed some plates that were nearly seven years old, and they showed practically no stain whatever. These plates were packed in contact with each other, with a piece of paper between slightly smaller than the glass. The only trace of staining was where the paper did not cover the film, and so protect it from the atmosphere. The other plates alluded to were packed in the general way with slips of paper—unusually thick—separating them, so that the films were exposed to the air and noxious vapours it contained, also to any deleterious exhalations from the packing paper. From this it will be seen that the presence or absence of marginal stains cannot be taken as any criterion as to the age of a plate. Again, the keeping qualities of plates coated with emulsion made by the boiling and by the ammonia methods vary considerably.

Photography Abroad.—A question is often asked in professional circles, when the effect of amateurs on the business is the subject of conversation, as to whether amateur photography has assumed the proportions on the Continent that it has done in this country. If the number of photographic societies can be taken as any criterion, it certainly has not; for it must be borne in mind that it is of the amateur elements that the larger proportion of them are composed. At the present time there is scarcely a large village without a society, and most towns of importance have several. Upwards of 250 photographic societies at present exist in the United Kingdom. It is very doubtful if all the societies throughout the world were added together they would amount to anything like this figure. Many very large and important cities on the Continent have no photographic society whatever, yet they contain, proportionately, as many, and in some instances more, professional photographers than places of corresponding size here. Munich, for example, with a population of between 300,000 and 400,000, and a very large proportion of professional photographers, as well as numerous large photo-mechanical establishments, possesses but one photographic society, and that numbers fewer members than the majority of the societies in the suburbs of London or small country towns.

Old Portrait Negatives.—What shall be done with old portrait negatives? Those who do a large portrait business find themselves, after a few years, encumbered with thousands of negatives from which copies will never be required. Photographers, or at least, the higher class ones, tacitly undertake to keep their negatives indefinitely. But some, after the lapse of from seven to ten years, set no further value upon them; yet there is an old saying amongst the profession that, if a negative be destroyed, copies from it are almost sure to be required. At one time, in the old collodion days, it was worth while to clean off old negatives—particularly when patent plate was employed—to use the glass again. Now, "that game is not worth the candle," because glass is so very cheap. What, then, shall be done with the stock of old and valueless negatives? Mr. Silvy, and others, when they retired from business, advertised that their old sitters could purchase their negatives for a small sum, and many were disposed of in this way. But some who tried the same plan some few years ago met with but little response, doubtless because but small value—now that people sit so frequently—is set on portraits after they are a few years old. This fact should be kept in mind by those purchasing businesses. One thing is certain, namely, the negative of a portrait should never go out of the hands of the photographer unless to the sitter.

An Astronomical Detective on Duty.—The interest of the paper recently read at the Parent Society's meeting upon the use of photography in detecting falsifications of documents, cheques, and similar objects that can be closely inspected, sinks almost into insignificance when compared with the latest efforts in searching for the unknown by photographic means. One of the triumphs of mathematical astronomy was the prediction of the existence of a planet owing to the perturbations of certain of the heavenly bodies, and the ultimate discovery of the planet. In a paper read before the Royal Society of Edinburgh in 1880, Professor Forbes predicted, with much confidence, that one or two planets must exist beyond Neptune. He said that there could be no doubt but that two planets moved in orbits external to Neptune, one at about 100 times and one at about 300 times the distance of the earth from the sun. Mr. Isaac Roberts wrote to the Professor for some indications, who replied that within a certain named range the planet, if existent, should be found. A chart of the region was made at Crowborough, and the region was covered by eighteen photographic plates. There was little fear of the object disappearing between successive exposures, for Professor Forbes estimated that before the path it travelled over covered as much space as the moon's diameter the average span of a human life would be twice passed. Two photographs were taken at an interval of not less than seven days, and with not less than an hour and a half exposure. The whole of the plates covering the region were carefully examined, and Mr. Roberts said it only remained for him to report (he was addressing a meeting of the Royal Astronomical Society) that no planets of greater brightness than a star of the fifteenth magnitude existed in the area indicated, nor was there anything in the plates of an abnormal appearance to which it was necessary to call attention. It could be wished that there had been another ending to the investigation, so great would have been the credit that redounded to our science.

OBSOLETE PROCESSES.

No. 3.—Wax Paper.

In the article on the calotype process it was mentioned that it yielded most excellent results. Such was the case, but its practice was attended with some inconveniences, one of the principal being that the paper had to be exposed and developed within a few days, at most, from the time it was sensitised. Indeed, in hot weather, or under adverse atmospheric conditions, it would not keep more than a day, or, if prepared with the maximum of sensitiveness, not beyond an hour or two. This led to the introduction of what was named the "wax-paper process."

In this process the paper, in the first instance, was saturated with beeswax, and, instead of being sensitised with gallo-nitrate of silver,

it was excited with a plain solution of nitrate of silver, strongly acidified with acetic acid. The paper, thus prepared, was, however, much slower than the calotype paper, but it possessed the compensating advantage that it would keep good for weeks, and, under favourable conditions, for months, before exposure. Hence for general landscape-work it superseded the older process. The English paper that was usually considered the best for calotype did not prove so good for the process now under consideration, inasmuch as the sizing matter being gelatine rendered the paper too hard and non-absorbent to permit of its even permeation by the wax with which it had to be saturated. If English papers were, however, employed—as they were by some—they were usually treated with hot water, sometimes slightly acidified, in order to remove some of the sizing matter prior to the waxing. The foreign papers, which were mostly sized with starch, such as those of Canson or Lacroix, were those generally preferred. There were two kinds of these papers, the thick and the thin. It was the latter that was commonly used for negatives.

For waxing the purest white beeswax obtainable was employed. The operation was as follows:—If only a few sheets were prepared at a time, they were laid separately upon a heated iron plate, and a lump of the wax rubbed over them, until the paper became saturated. But the more convenient way—as this paper would keep indefinitely—was to prepare a good stock at a time. In this case the wax was melted in a flat dish, and the sheets floated upon it. When either of the papers just named was employed, they were quickly permeated by the molten wax. The paper was then removed, drained, and the wax allowed to congeal. When a good number of sheets had been thus treated they were each placed between sheets of clean blotting-paper and then ironed with a laundry iron, sufficiently hot to thoroughly melt the wax and cause the superfluity to be absorbed by the bibulous paper. When finished the paper was quite translucent, and had, if properly manipulated, a perfectly even texture.

As the wax, to some extent, prevented the silver salts from combining with the paper itself, it was found desirable to introduce some organic matter with the iodising material, such as sugar of milk, honey, isinglass, albumen, gum, &c. In this matter almost every worker had his own pet formula, as well as for the salts of silver to be formed in the paper, such as the iodide, bromide, chloride, cyanide, fluoride, &c.

Here is a typical formula, and one that gave excellent results:—Distilled water, or, preferably, water in which rice had been boiled, one pint; iodide of potassium, half an ounce; bromide of potassium, ten grains; cyanide of potassium, twelve grains; fluoride of potassium, four grains; sugar of milk, half an ounce; albumen, a similar quantity, and sufficient iodine to give the solution a deep shiny colour. Sometimes, in addition to these materials, others were added. For example, chloride of sodium, honey, isinglass, gum, and several other materials had their advocates. Indeed, it may be almost said that the more complex the iodising solution was the better it seemed to be appreciated by some people. It must be mentioned, however, that there were distinct advantages to be gained by the employment of some of the substances used. For instance, organic matter, like sugar of milk, &c., was indispensable, for the reason already indicated. The bromide certainly enhanced the sensitiveness, and the chloride and the fluoride was, by some, thought to do the same. Again, the cyanide served a good purpose in assisting the permeation of the paper by, in a measure, destroying the greasy and repellent nature of the wax. The iodine, too, was decidedly an advantage in ameliorating, or removing, metallic particles, and furthermore, by combining with the starch in the paper, rendering it a dark blue or violet colour. When so tinted, air-bubbles, or inequalities in the salting of the paper, were at once manifest. The sheets were iodised by immersing them in the solution, where they were allowed to soak for an hour or two, or until they had assumed an even violet tint. They were then hung up by one corner to dry. It was customary to iodise a good stock at a time, as the paper would keep for a long period if preserved dry.

The sensitising solution was thirty grains of nitrate of silver and forty minims of glacial acetic acid to the ounce of distilled water. These proportions were, however, often varied according to circumstances. For example, if the paper were for immediate use, the nitrate of silver might be increased, while the acid was diminished, with a corresponding gain in sensitiveness. Conversely, if the paper had to be kept for a long period before use, the silver was decreased, while, at the same time, the sensitiveness was retarded, good keeping qualities and high sensibility being inimical. The solution could be applied either with a glass rod or by pouring some on a glass plate and floating the paper upon it as described for the calotype process. But, if many sheets had to be sensitised at a time, the solution was generally put into a shallow dish and the paper floated upon its surface. The paper was allowed to remain on the solution until the blue tint of the iodide of starch was discharged. It was then washed in two or three changes of water. The more perfect the washing, the longer the paper would keep, with some sacrifice of sensibility, however.

The exposure, as before mentioned, was much longer than with calotype. But with a portrait lens and a good light out of doors, under favourable conditions, a negative could be obtained in thirty or forty seconds. With a landscape lens, aperture about *f*-30, and paper of medium sensitiveness, an exposure of from twenty minutes to three-quarters of an hour, according to the subject and the quality of the light, was required. Although the paper would keep for some time, it was customary to develop as soon after exposure as possible.

The developer was a saturated solution of gallic acid in water, to which a few drops of the sensitising solution had been added. The paper was floated upon the solution, or sometimes immersed in it. If the paper were prepared for immediate use, it was usually but slightly washed. Then the addition of the silver was not made until the image was well out, the paper having sufficient free silver in it to start the development.

The development of wax-paper negatives was a somewhat tedious operation. If the negative was very fully exposed, the development could be completed in ten to twenty minutes, but, more often than not, it was a question of two or three hours, though, of course, several negatives, in separate dishes, could be developing at the same time. The time was, however, often shortened—frequently with advantage to the picture—by slightly warming the solution. In place of gallic acid, pyrogallic, in the proportion of a grain or two to the ounce of water, was sometimes used. When the image was fully developed, it was well washed in several changes of water, and the surface gently rubbed with a tuft of cotton wool or a broad camel's-hair brush. Extreme cleanliness, it may be mentioned, in working was essential in order to avoid stains and marble-like markings.

The great reformer of the complexity involved in the preparation of wax paper was Mr. F. Townsend, who, with one blow, demolished the great variety of ingredients mentioned in the typical formula given above, and reduced them to two only, iodide and bromide of potassium, with which had been dissolved enough iodine to impart a sherry colour to the water forming the solvent. The advantages claimed for this paper, when excited in a bath varying from fifteen to thirty grains in strength, were great delicacy and brilliance, good half-tones, sensitiveness, non-solarisation, sensitiveness to the green rays, and absolute certainty. We here give Townsend's formulæ, as it is not improbable that some may be induced to try it. At any rate, some negatives of large size, at present in our office, have been seen and examined by many, who declare that they possess features of excellence so great, that upon any details of practice being published they will certainly give the process a trial. The paper is immersed in—

Iodide of potassium	600 grains.
Bromide „	200 „
Water	40 ounces.

To this add four or six grains of iodine, or enough to impart a sherry colour. Let the paper remain immersed in this for two hours. When quite dry, sensitise for six or eight minutes in a thirty-grain silver bath, to which a minim of acetic acid is added for each grain of silver. If the paper is to be kept long, the proportion of acetic acid should be increased. When sensitised, remove the superfluous silver by clean blotting-paper. The development is effected by a saturated solution of gallic acid, to every four ounces of which a drachm of the silver-bath solution is added, together with a few drops of acetic acid (glacial).

The negatives are fixed in a solution of hyposulphite of soda, two ounces to the pint. In this solution they remain until the yellow iodide of silver is completely removed. A thorough washing completes the picture. Generally, when the negatives are dry, they

have a more or less dull or opalescent appearance; but the transparency of the paper is quickly restored by holding them before the fire for a few minutes.

The wax-paper was an excellent process, and one which, in skilled hands, yielded charming results. Many of our oldest readers will call vividly to mind the admirable Russian views that were taken by the late Mr. Roger Fenton in the early fifties.

CONTINENTAL NOTES AND NEWS.

The Paris Photographic Apparatus Exhibition.—From the list of exhibitors in this Exhibition, given in the June number of *L'Amateur Photographe*, we gather that very few English houses indeed have taken installations for the display of their products, and, on the whole, the international character of the exhibition is not well sustained. French firms appear, however, to give it a very hearty support, which may in some degree account for the coldness with which it has been treated abroad.

"The Originator of Emulsion Printing-out Papers."—According to M. Gravier, who lately discoursed on aristotype and cognate processes before the *Société d'Etudes Photographiques*, the process of printing on emulsion printing-out papers was originally made public by the late Dr. Van Monckhoven in 1862. History, however, attributes the introduction of the process to the late Mr. G. Wharton Simpson in the year 1865; but history and M. Gravier are both wrong. So long ago as 1867 we conclusively proved that the collodio-chloride process was first published by Alexis Gaudin in 1861.

Para-amidophenol Nitrate.—The employment of para-amidophenol chlorhydrate in conjunction with sodium sulphite and potassium carbonate has been found by some workers to induce a retarding action of the developer, due to the formation of potassium chloride, which is said to act as a retainer. To obviate this, Dr. Schüchart, of Gorlitz, recommends the employment of para-amidophenol nitrate, which is freely soluble in water, caustic soda replacing the potassium carbonate as the alkali. It is suggested, however, that the substitution of sodium carbonate for the potassium salt in the original formula would equally prevent retardation of development.

Amidol.—According to Dr. Eder, who details the results of his experiments in the June number of the *Correspondenz*, amidol $\left(C_6H_3\begin{cases}OH\\NH_2\end{cases}\right)2$, with the addition of sodium sulphite, and without alkali, acts as a developer *per se*, and is said to be superior in some respects to ordinary alkaline developers. It is, we believe, the case, although it is not generally known, that a solution of eikonogen alone will develop the image, although very slowly. Possibly the addition of sulphite would, as in the case of amidol, play the part of an accelerator.

Blue Positives for the Lantern.—Mr. Gaston Henri Niewenglowoski quite truly says that blue lantern slides may be made by dissolving out the silver bromide from a gelatine plate, sensitising the remaining film with potassium ferridcyanide and ammonia citrate of iron as for blue printing, and exposing, &c., as usual. But the operation appears to us to run the original Chinese idea of how to obtain roast pig very close for circumlocutory indirectness. A simpler plan, possibly, would be to develop an ordinary lantern positive with ferrous oxalate, and before removing the last trace of iron to flood the plate with a solution of potassium ferridcyanide, which would yield the desired azure-tinted picture.

An Imitation Platinotype Paper.—At the April meeting of the Société Française de Photographie, M. A. Pavard read a paper, in which he said that Professor Boivin, after many experiments with the salts of iron, has prepared a paper with those salts as a base, which keeps well, and is cheaper than either platinum or silver paper. It is printed out until the details of the shadows are seen, and, when removed from the frame, the image is either steamed or breathed upon. This developes the picture, which, after washing, is "fixed" in a solution consisting of—

Water		1000 parts.
Hypo		80 ,,
Gold chloride	(1:1000)	20 to 40 c.c.

This bath gives purple, sepia, or warm black tones, according to the length of immersion of the print.

Development and Temperature.—Dr. Miethe has recently been giving some attention to this subject, and remarks that it is well known that in general cold developers act with less energy than warm developers, and that some cold developers give stronger negatives than warm ones. The influence of temperature on the developing power of the various substances varies with different developers. As to the sensitiveness joined to temperature, he places modern developers in the following order: hydroquinone, pyrogallol, iron oxalate, eikonogen. The latter, as regards its reducing power, does not appear to be influenced by the temperature; hydroquinone, however, is so affected that at 40° Fahr. it has no reducing power over the exposed image. Pyro, with a salt of soda, like ferrous oxalate, exhibits little diminished activity even at a point so low as 32° Fahr. At a low temperature, eikonogen gives weak negatives instead of strong ones as do the other developers.

Reversals with Thiosinnamine.—M. H. Fourtier, in the *Photo Gazette*, details the results of some experiments, on the lines of Colonel Waterhouse's now classic work with carbamides in the developer, made in order to obtain reversals in development, in which, however, it appears that he was utterly unsuccessful. Exposing a plate in the printing frame to a positive he obtained a fine negative, with no sign of reversal whatever. It appeared to him that the thiosinnamine played the part of an accelerator, since the image appeared very quickly. This might be accounted for in another way, as it would require a very slow plate and an extremely brief exposure to daylight in a printing frame in order to prevent the image rushing up under development. M. Fourtier also states that a series of instantaneous pictures all gave on development negative results, and the effect of largely increasing the thiosinnamine was to prevent the appearance of any image at all. The thiosinnamine is undoubtedly at fault. Perhaps Colonel Waterhouse would kindly put M. Fourtier in the way of obtaining a suitable sample.

The International Union of Photography.—We have received the rules and regulations of the International Union of Photography, which was founded at the International Congress assembled at Brussels last year. The Union is due to Mr. S. Pector, who conceived the idea of an exhibition which should be a federation of all amateur societies and of all persons interested in photography. "The Society has for its object, in the first place, "the dissemination of ideas, and the making of constant efforts to establish unity of action in regard to photography, so that facilities for the comprehension, study, and utilisation of any new facts might be afforded to all. These facts will henceforth be published in accordance with a method universally adopted, based and expressed on a system generally admitted. The Society also has for its object the collection of information in regard to all fresh discoveries in photography, in the Old and New World, in order to make them universally known to all persons interested in the conquests made by the genius of man over the as yet unknown dominion of the photographic art." The General Secretary's address is, M. Pector, 9, Rue de Lincoln, Paris, and further particulars may be obtained of him.

Printing-out Platinotype.—The following formula, according to one of our Continental exchanges, is simple in working and yields results of the highest class. Suitable paper is floated on a solution consisting of—

Gelatine	6 grammes.
Ammonia alum	2 „
Methylated spirit	120 c.c.
Water	450 „

Float for ten minutes, and when dry sensitise on a mixture of 10 c.c. of each of the following solutions:—

I.

Potassium chloroplatinite	6 grammes.
Distilled water	35 c.c.

II.

Peroxalate of iron	6 grammes 50
Distilled water	35 c.c.

The operations of exposure, development, and clearing are already too familiar to our readers in connexion with the well-known hot-bath platinum process to need recapitulation here.

"**Mixtol.**"—This is the name of a Continental one-solution developer, and the following is its composition:—

Boiling water	1000 c.c.
Sodium sulphite	120 grains.
Hydroquinone	15 „
Eikonogen	10 „
Potassium ferrocyanide	20 „
Potassium carbonate	75 „
Caustic potash	15 „
Potassium bromide	1 „
Glycerine	2 drops.

It would be interesting to persuade the authors of these modern complicated developing and toning and fixing formulæ to state clearly the assumed action which all the various ingredients of the solutions are supposed to have, accompanied with a practical demonstration thereof. The inventor of mixtol, however, has brought his own punishment upon him. He claims that it does not stain the film, and then incautiously advises the use of an acid fixing bath to remove the yellow stain caused in development, with mixtol, of course. He furthermore claims that mixtol keeps well, but only advises its preparation in quantities of from 300 c.c. to 500 c.c. at a time. One of his critics put a finger on the contradictory nature of this piece of advice, and asks why, if the developer keeps well, only a small quantity is recommended to be made at a time; and also why, if it does not stain the plate, an acid fixing bath to remove the yellow stain is recommended?

PICTORIAL SELECTION IN PHOTOGRAPHY.

[Photographic Section of the Croydon Microscopical Society.]

In dealing with the composition of pictures in reference to photography, apart from painting, it is only necessary to treat of: the position and arrangement of lines; the balance of parts; the variation in the tones of light and shade; and the most suitable positions for the introduction of figures or other objects which shall go to form a pleasing picture.

Let me, however, at the outset, explain that it is farthest from my wish to insist exclusively on any one series of rules upon which all pictures should be constructed, any more than I would desire to enforce a standard by which all works should be judged whether they be good or bad. I mean that, having regard to the great difference of opinion held on matters of art, it is useless to lay down an inflexible or hard-and-fast line which admits of no departure. I hope, therefore, the remarks I may make will be accepted rather in the light of "hints," in the carrying out of which a better result may be obtained than would otherwise occur should these points be overlooked or neglected.

Seeing that photography is so purely a mechanical process in which the artist has no chance of leaving out any objectionable object which may detract from the view before his lens, it is of the utmost importance he should know some of the principles on which a good picture is built up, in order that he may in some measure be able to cope with the difficulty and perhaps overcome it. To know where and how to select the best standpoint, how much of the prospect to include in his picture—and, of equal importance, how much he should *ex*-clude—to note the changes under varying lights, the relief of those portions in light against others in shade or cast shadow, the judicious arrangement of parts, or the apt introduction of figures requires more training than the setting up of a camera, the snapping of a shutter, and the subsequent development of a plate; yet it is only on acquiring such knowledge that the photographer is able to excel, or that really artistic pictures can be produced.

To some these matters present little difficulty, they grasp or overcome them without apparent effort, in some instances are hardly conscious of having exercised any discrimination in their choice, and, if questioned on the composition of their pictures, could only tell you "they liked them that way best." Others are not so happy; they never get successful pictures—their horizon is too high or else it is too low, sometimes too dense, at others hard to find; the front elevation of a house appears to afford them interest; whilst a large tree in the centre, with a smaller one equidistant on either side seems, to them, quite an ideal picture, the embodiment of perfection in composition—having a due regard to the equal balance of parts. Sometimes they essay figures or portraits (?) of their friends, and, remembering the triangular form has been, by some, greatly extolled, they straightway place their central figure in a standing position, carefully arranging the residue of their victims in sloping order, on either side, with a result too dreadful to dwell upon.

One could multiply these instances, but enough has been said to show how necessary it is to have either some knowledge of pictorial effect or, failing this, the desirability of becoming acquainted with a few of the rules of art.

Composition is the art of properly disposing or arranging in the most effective manner the various forms and objects which constitute a picture, or, in other words, the judicious selection and combination of various parts which, when united, form one perfect whole. Sir Joshua Reynolds, when speaking of painting, says: "Composition, taken generally, is the principal part of invention, and is by far the greatest difficulty the artist has to encounter. Every man that can paint at all can execute individual parts; but to keep those parts in a due subordination, as relative to a whole, requires a comprehensive view of the art, that more strongly implies genius than perhaps any other quality whatever." Let us now see of what this quality consists; and, in the first place, consider the arrangement of lines.

Lines.

The term "line" is not altogether satisfactory, as there are no actual lines in nature, but it must in this instance be understood to refer to the apparent boundary of different objects, the limit at which they seem to merge the one into the other. The most important line, or that which has the greatest influence on all the others in a picture, is known as the horizon, or "horizontal line," which should always indicate the height of the eye of the spectator. This line varies in height with the position chosen, so that, when standing on a common or the seashore, the horizon appears low, but in ascending a cliff or hill it is found to rise in proportion to the height attained; hence, in the former case of the seashore the horizon would be situated about a third or a fourth of the height of the picture above the base line, whilst in the latter instance it would be much nearer the top. It should not on any account be allowed to divide a picture exactly in the middle, as in this case all lines receding from the spectator, either from above or beneath, would be too equal to form a pleasing result. No exact height need be given, but, as a guide for all open prospects which present great distances at a low level, it would be well to assign the horizon a position not exceeding, say, one-third the height of the picture above the base line, where it would give greater variety to the lines running from the spectator, and altogether form a more pleasing and agreeable composition. For pictures taken from an elevation, the space from base to horizon would perhaps occupy three-quarters of the height of the composition, or possibly even more; but let me here remark that the greatest care should be exercised in determining the height of the horizontal line, as it is on reference to its relative position that an intelligent observer would recognise at once the altitude from which the picture was taken. It is equally necessary to bear this in mind when making "slides" or trimming prints to guard against cutting off more of the foreground than the sky, thereby reducing the height of your horizon, and in consequence falsifying your picture.

Having decided on your horizontal line, it is necessary now to note the direction taken by the other lines, which are regulated by the position of the "point of sight."

Point of Sight.

The point of sight is always situated, as you are aware, opposite the eye on the horizontal line. You will remember the fact that objects are

seen by means of rays of light proceeding in straight lines, some of which meet at the eye of the observer; and I need only point out that, supposing that observer should choose the centre of a long, straight, and level street for the scene of his operations, he would get a series of lines from the ruts, gutters, footways, and houses more suggestive of a geometrical design than a pleasing representation of an inhabited thoroughfare (Fig 1).

Fig. 1.

The same remarks apply to the point of sight as were made in reference to the horizon in the undesirability of giving it a central or middle position. It should be placed, more or less, either to the right or left of the centre, so that, by presenting more of the subject on one side than another, formality is avoided, and the angles of the general lines are more advantageously varied (Fig 2).

Having determined the position of the horizon and the point of sight, it should next be seen how the lines of the landscape compose them.

Fig. 2.

selves. Many methods have been advanced for the most perfect arrangement of lines, but in the infinite variety of subjects which are presented it is almost impossible to be guided by precept alone. Parallel lines should always be avoided, as, apart from their tendency to suggest a geological diagram, they serve to conduct the eye from side to side of the composition, a defect which should be carefully guarded against (Fig. 3). Lines which guide the sight perspectively through the picture, or which lead the eye from the foreground through the middle distance on to the horizon, are always the most pleasing and agreeable, and should invariably be selected in preference to all others (Fig. 4.) Lines which have a tendency to encircle a view should not be lost sight of, as, in addition to the help they afford of keeping the eye in the picture, they also assist to concentrate the attention on the chief point of interest beyond. As instances of this effect I might cite *A Peep between Trees*, or a pathway through a wood, in which the stems and branches of the trees would take the direction named. If in the first position you have chosen to set up your camera you find the lines of the foreground rising perpendicularly from the base line, reject it at once, and move to a spot where they shall incline either to the right or left. The lines, then taking a slanting direction, will lead the eye into the picture

Fig. 3.

in a far more agreeable and satisfactory manner than if they had followed the vertical tendency which obtained in the first situation.

Points.

Observe where the most prominent feature of your landscape comes, whether too much in the centre of your picture or too near its limits.

Fig. 4.

It is generally considered bad taste to have any object coming exactly in the centre of a composition so that it shall be equidistant from the outside lines of the picture, and this should be borne in mind when focussing the landscape, but I shall have something more to say in reference to this later on. Note whether you have one point immediately over another, and, if so, make some little alterations in your position to remedy this defect. Do not have two or more parts of your picture of nearly equal size, neither let the undulations of, say, "a moorland with distant hills" cut up your composition into several equal portions—a circumstance of very frequent occurrence in all such situations as well as in mountainous districts.

W. D. G.

(To be continued.)

THE TELE-PHOTO LENS: ANGLES AND FOCI.

[London and Provincial Photographic Association.]

Distances of Focussing Screen from Compound Negatives or Back Focl. (1)	No. 1. Angle included is practically constant; at Full Aperture = 11° (2)			No. 2. Angle included is practically constant; at Full Aperture = 12° (2)			No. 3. Angle included is practically constant; at Full Aperture = 9° (2)		
	Corresponding Focl.	Intensity at Full Aperture.	Circle of Illumination at Full Aperture.	Corresponding Focl.	Intensity at Full Aperture.	Circle of Illumination at Full Aperture.	Corresponding Focl.	Intensity at Full Aperture.	Circle of Illumination at Full Aperture.
Inches.									
4	17½	1/121	3½	20	1/16	4¼			
5	21	1/13	4¼	22½	1/11	4¾ 3½×3½			
6	24	1/13	5¼ 3½×3½	25	1/12·5	5¾ 4½×3½	34	1/12·4	5¼ 4½×3½
8	30	1/16	6¾ 5×4	31½	1/16	7¼ 5×4	42½	1/16	7 5×4
10	36	1/23	8¼ 6½×4¾	37	1/19·5	9¼ 6½×4¾	47½	1/17	8¾ 6½×4¾
12	42	1/26	10	45	1/22·5	11 8½×6½	56½	1/26	10
14	48	1/30	11¾ 8½×6½	50	1/25	12¾	63	1/33	11¾ 8½×6½
16	54	1/33	13½ 10×8	57	1/31	14½ 10×8	71	1/26	13½ 10×8
18	60	1/37·5	15	62½	1/32	16¼ 12×10	78	1/28	15
20				69	1/35	18 13×11	85	1/30	16¼ 12×10
22				76	1/38	19¾ 15×12	92	1/33	18 13×11
24				84	1/42	21¼	100	1/36	20 15×12
26							106	1/35	22¼
28							114	1/40	24¾ 18×16
30							124	1/45	27
40							157½	1/60	42 30×24

(1) To obtain the distances from the *flange* to the focussing screen, add 3½, 4, and 6 inches for Nos. 1, 2, and 3 respectively.

(2) The angle included is a constant for *one* aperture for any distance of focussing screen, but it diminishes as smaller diaphragms are employed.

The diaphragms are so arranged that for any initial extension (and corresponding intensity) each succeeding smaller diaphragm requires double the exposure of the next larger.

There are seven diaphragms, ranging from full aperture to the *smallest*, which requires sixty-four times the exposure required for full aperture.

The smallest stop reduces the angles included at full aperture in Nos. 1, 2, and 3 to 8½°, 9°, and 6½° respectively.

No. 1 tele-photographic lens consists of the patent stereographic (1·6 inches diameter) in conjunction with a compound negative ⅛ of an inch diameter.

No. 2 tele-photographic lens consists of the 1B. patent portrait (2 inches diameter) in conjunction with a compound negative ⅛ of an inch diameter.

No. 3 tele-photographic lens consists of the 2B. patent portrait (2½ inches diameter) in conjunction with a compound negative 1 inch diameter.

T. R. Dallmeyer.

THE CAMERA AND THE CONVENTION; OR, PICTURESQUE SCOTLAND AND PHOTOGRAPHY.

VI.

The Falls of Clyde will be remembered by many who were at the Glasgow Convention, and joined the trip to Lanark. Unfavourable weather always leaves a lasting impression, and, like the witches in *Macbeth*, we met "in thunder, lightning, and in rain." In fine weather, however, the Falls of Clyde are a very enjoyable photographic field, but only part of it could be well overtaken in one day. From Lanark you will get a vehicle to take you down to the gates of the grounds; but, if your apparatus is weighty, get your man to drive right in, if they will allow you, and, if not, have some one engaged to carry your traps, for some parts of the roads are hilly and rugged, and, if it is a hot day, it is very fatiguing. We have been there and found it so.

Lanark.

A good way to go to the falls at Lanark is by train to Hamilton and thence by coach. The first place of interest by this route is Tillietudlem Castle, which figures in Sir Walter Scott's *Old Mortality*. The ruins of this castle are on the hill about a mile and a half from the high road. Your conveyance is left at a wayside inn, and the approach to the castle is made on foot, by the side of a glen most of the way, very picturesque, well wooded, and full of charming studies. The last time we were at Tillietudlem the castle was surrounded with fruit trees, rich in blossom, and all the ground was carpeted with the fallen blossoms. Some good negatives are to be had here, but we would warn you that it is a considerable pull up the hill if your apparatus is heavy.

Next we come to Stonebyre's Fall, which is within four miles of Lanark. There is considerable difficulty at this fall in getting sure footing at suitable places for the most effective pictures. It is the largest fall, and the volume and rush of water to be seen here when fairly full is magnificent. Still it is not easy to get at, and needs a little nerve.

From here we drive right on to the town of Lanark. It is of interest as a town, being the place where Wallace, the hero of Scotland, began his career. And Wallace's Cave is still shown on the Mouse Water, about a mile north-west from Lanark.

From the hotel at Lanark, you will get a conveyance to carry you to the Falls of Bonnington and Cora Linn. A day's work is to be had at and around these two falls; everywhere we turn the glen and grounds are one succession of beautiful panoramic pictures. Cora Linn is the first fall reached, and good positions for effective pictures of this fall are easily obtained. The Bonnington Fall is also easy of access.

For pictures of fall, and rushing stream, and rich woodland scenery, those that are to be found here, amidst the mighty sound of ceaseless falling waters, are unsurpassed.

If the falls are to be visited by rail instead of driving from Hamilton, the journey to Lanark is twenty-five miles from Glasgow.

Ayr.

The town and district of Ayr is looked upon with intense interest and pleasure by every lover of Robert Burns', Scotland's son of song, and we believe every Scottish heart warms at the mere mention of his name. Ayr is about forty miles from Glasgow. The town itself possesses some points of interest, such as the Wallace Tower, in the High-street; and before reaching it, on the same side of the street, is the "old pub" where Tam O'Shanter and Souter Johnnie did carouse on that night when Tam got such a fleg at Auld Alloway Kirk, and just saved himself at the expense of his auld mare's tail. Then there's the "Twa Brigs" and the "Fort of Ayr," and the River Ayr, up beyond the station a mile or two, is rich in pictures. Burns' birthplace is not more than two miles from the town. This, and the Auld Alloway Kirk, Burns' Monument, and the auld Brig o' Doon are all within a quarter of a mile of each other.

There is a new Brig and the auld Brig, and a little house, with some statuary and relics of Burns, and Burns' Monument, all within the grounds at the back of the hotel, and all quite convenient for photographic purposes. And up the river, beyond the Auld Brig, there are some old mills and other quaint studies.

When at Ayr we drive to the Brig of Ballochmyles. Here we can get some good river pictures. This ground is also closely associated with Burns' life, for the Braes of Ballochmyle are only about two miles from Mossgeil.

Coaching Tours.

Just as we write, we see that there is a series of new coaching tours being started in Ayrshire for the summer months. Intending tourists take train from Glasgow to Ayr, reaching Ayr early in the day, where a char-à-banc, a vehicle arranged for twenty passengers, awaits the arrival of the train, and takes one of three routes, as it is arranged to go to one of the following each day:—Straiton, Culzeau, or Ballochmyles, returning

to catch the train at Ayr in the evening. Either of these excursions would take the tourist through some of the most charming scenery in Scotland. The only thing we doubt is that the journey being done against time, so to speak, there will not be opportunity to photograph as much as one would like. We have gone over a considerable portion of the ground that these tours intend to embrace; but we had lots of time to look round and photograph, and, under these circumstances, had a good holiday.

Water Excursions.

From Glasgow the outings that appeal most to the stranger, and those that are mostly taken advantage of, are the "Doon the Water" excursions. There is a story told about a Paisley weaver, on board of one of the river steamers, who, on going down to the cabin for a drink, called out, "Steward, steward! mind you cry me up whin the scenery begins!" And we sometimes think that there is more than the weaver possessed with this idea, for the tourist in his haste usually takes the train to Greenock or Gourock, and catches up the boat at either of these places, so that he may be launched into the picturesque at once without having the labour of gradually approaching it. We believe, however, that the stretch of river between Glasgow and Greenock possesses many pictures and effects that in such a hurry are lost to the tourist.

From Govan, down both sides of the river, for these first twenty miles there are endless and ever-changing bits of scenery, that in a region less wealthy in beautiful effects would be hailed as charming.

We have done a good day's work at and around Renfrew, and on the Blythswood Estate, a little further down on the same side, while on the opposite shore is old Kilpatrick, with the canal behind [the houses, and the old boats slowly moving on its sleepy surface onward to the Clyde. Then lower down lies Bowling, which would well repay a visit; and Dumbarton Rock and Castle, from shore or river, is well worthy of a plate or two.

Greenock.

And now we come to Greenock. The Greenock piers are much frequented by the photographers who delight in instantaneous pictures. The old piers, Prince's Pier, and the new landing-stage at Gourock, give plenty of choice for this class of work. Moving steamers and boat pictures generally may be easily had from any of these points as well as the Esplanade at Greenock.

Everything will be found to make work easy, the river at these points being narrow enough to allow of getting a suggestive distance introduced, obtained from the hills and foliage on the further shore. On the quays themselves the traffic is constant and ever-changing, and, like the bits of glass in a kaleidoscope, the moving groups are ever taking new forms. Photographically, the town of Greenock is not of much count. Burns' Highland Mary is buried here, and Greenock was the birthplace of James Watt.

Gourock.

Gourock stands next to Greenock, on the same shore; but this side of the Clyde does not lend itself so much to the excursionist out for the day, who desires, when reaching the scene of action, to have the picturesque ready to his hand. One really romantic glen and dell, however, is to be found between Gourock and Wemyss Bay at Inverkip. For river scenery it is a gem in a foliaged setting between two hills.

Wemyss Bay in itself possesses some good points for water pictures, but for landscape views it shelves too much to the sea. Largs is also barren of any wide range of picturesque photography. We have taken the train from Largs to West Kilbride, and walked back by the seashore to Fairlie, and we found this ground rich in seascapes and rock effects.

Coming further round the coast, we touch at Ardrossan and Saltcoats, both of which places—leaving the sea out—are too towny for effect. Good shipping is sometimes to be had at Ardrossan.

RELATIVE EXPOSURES FOR VARYING PROPORTIONS OF IMAGE TO THE ORIGINAL.

[Photographic Society of Great Britain.]

When an enlarged photograph has to be made, either from a negative or print, it is commonly understood that the greater the degree of enlargement the longer will be the exposure required, but I have generally found only the vaguest ideas to exist as to the amount by which such exposure has to be prolonged. Sometimes, indeed, it is assumed that the exposure will be in direct inverse proportion to the area covered, so that a copy of twice the linear dimensions of the original—covering, as it does, an area of four times the size—would require an exposure of four times that sufficing for a copy of the same size. This calculation, however, omits to recognise an important factor, and leads to serious error; the actual exposure required in the case mentioned (assuming the same lens and stop to be used), being not four times, but two and a quarter times that of a copy of same size; whilst, when we come to high degrees of enlargement, the error would amount to an indication of nearly four times the exposure actually required.

To find the relative exposure, add one to the number of times that the length of the original is contained in the length of the image, and square the sum. This will give the figure found in the third column of the annexed Table.

Proportion of image to original (linear).	Distance of image from lens* in terms of principal focus.	Proportionate exposures.	Exposures proportioned to that required for copying same size.
$\frac{1}{30}$	$1\frac{1}{30}$	1·07	·27
$\frac{1}{20}$	$1\frac{1}{20}$	1·10	·28
$\frac{1}{10}$	$1\frac{1}{10}$	1·21	·3
$\frac{1}{8}$	$1\frac{1}{8}$	1·27	·31
$\frac{1}{6}$	$1\frac{1}{6}$	1·36	·34
$\frac{1}{4}$	$1\frac{1}{4}$	1·56	·39
$\frac{1}{2}$	$1\frac{1}{2}$	2·25	·56
$\frac{3}{4}$	$1\frac{3}{4}$	3·06	·76
1 (Same size)	2	4	1
2	3	9	2·25
3	4	16	4
4	5	25	6·25
5	6	36	9
6	7	49	12·25
7	8	64	16
8	9	81	20·25
9	10	100	25
10	11	121	30·25
11	12	144	36
12	13	169	42·25
13	14	196	49
14	15	225	56·25
15	16	256	64
16	17	289	72·25
17	18	324	81
18	19	361	90·25
19	20	400	100
20	21	441	110·25
21	22	484	121
22	23	529	132·25
23	24	576	144
24	25	625	156·25
25	26	676	169
26	27	729	182·25
27	28	784	196
28	29	841	210·25
29	30	900	225
30	31	961	240·25

As examples: supppose a copy is wanted having twice the linear dimensions of the original. Take the number 2, add 1 to it, and square the sum, $3^2=9$. Again, if a copy is to be of eight times the linear dimensions of the original, take the number 8, add 1, and square the sum, $9^2=81$. Copies respectively twice and eight times the size (linear) of the original will thus require relative exposures of 8 and 91—*i.e.*, the latter will require nine times the exposure of the former.

It is convenient to have a practical standard for unity. An image of the same size as the original is a familiar case, and serves as such standard. By dividing the figures in the third column by four, we get at the figures in the last column, which represent the exposure required for varying degrees of enlargement or reduction, compared with the exposure for a copy of the same size.

The Table is carried up to enlargements of thirty diameters; that is about the amount required for enlarging a small *carte-de-visite* to life size.

The exposures required in reductions do not vary at all to the same extent that they do in enlargements. It has, therefore, not been thought necessary to fill in the steps between images of $\frac{1}{10}$ and $\frac{1}{20}$, and between $\frac{1}{10}$ and $\frac{1}{30}$ of the size of the original. Beyond $\frac{1}{30}$ there is scarcely any perceptible difference in the exposure until disturbance comes in from another cause, a considerable distance of illuminated atmosphere (haze or fog) intervening.

* With a double lens it is usually sufficient to measure from the position of the diaphragm plate.

The figures in the second column will also serve as a Table for distances from the lens to the plate and to the original, all that is necessary being to multiply by the principal focus of the lens in use. In the case of enlargements the figures less than 2 must be multiplied to get the distance from the original to the lens, and the figures greater than 2 for the distance from lens to image. For reductions, the figures less than 2, multiplied by the principal focus of the lens, yield the distance from lens to plate; and the figures higher than 2, similarly multiplied, give the distance of original from lens.

W. E. Debenham.

ADVANCED PHOTOGRAPHIC WORK FOR AMATEURS.

II.

Let us now see how any lady or gentleman, who having made a small quantity of emulsion (it will be about six ounces), as described in the preceding article, should set about coating their first plates, and here I recommend their beginning with small sizes and only a very few just as a start until they get their hand in, when they will, no doubt, fly at higher game before long. To begin with, however, two or three at modest quarter-plates or, at the outside, three half-plates, only should be taken in hand, because there will be less likelihood of mess or failure than when larger sizes and greater numbers of plates are manipulated.

Begin, therefore, by having, say, three perfectly clean half-plate opals with matt surfaces on one side ready, place these in a flat tray containing hot water so as to keep them at a nice warmth when the emulsion is being poured on them. This done take a lump of the emulsion about the size of a small egg and melt it by placing the tumbler containing it in hot water, or it is better to use a glass graduate measure having a pouring lip. When the water is heated to 100 degrees Fahr. the lump of emulsion will be all melted, and after standing on the water for about five minutes the emulsion will be of the proper warmth for coating. Whilst the emulsion is being melted it is well that a moment's attention be given to a simple arrangement for holding the coated plates so that the emulsion will set perfectly even and flat. An ingenious mind will not be long in finding in any well-ordered household some suitable support for this purpose. I would, however, suggest a few old negative glasses of larger sizes, such as 15 × 12, or 12 × 10. When only small opals are being coated these levelling supports are easily set true with the aid of a common spirit level, which, doubtless, every amateur who has gone this far in photography will have at hand, if not, the sooner he gets one the better, and then let it be circular in form. Having, therefore, arranged for the setting of the plates when coated, let him proceed to take an opal from the dish of warm water in which they were placed, and with the aid of a clean, dry towel make the opal quite free of damp, both back and front and round the edges. This done, let the opal be taken between the forefinger and thumb of the left hand at the left bottom corner, and holding the plate as nearly flat as possible, with the right hand take the graduated glass measure containing the emulsion out of the hot water, and by placing the lip of the measure *quite close* to the surface of the opal quietly and slowly proceed to pour a *round pool* of emulsion on to the middle of the plate. A very slight practice will enable any one to judge of the size of the pool. Now, by gently tilting the plate, and by coaxing with the little finger of the right hand, which still holds the glass measure, the emulsion on the plate is coaxed to the four corners and over the entire surface. If it is judged that too much emulsion has been flowed on, a very slight tilting of the plate will enable a portion to be run off into the measure. The plate is then coaxed till the surface is evenly covered, and without delay placed on the levelling stand. Meantime, the glass measure containing the emulsion has been reset in the hot water to keep the contents at an even temperature until all the plates are coated in a similar way.

Now, when gone about deliberately there is no mess or difficulty in coating a plate with emulsion in the manner I have described. I feel the great secret of success lies in having the opals slightly warm, or, at least, with the chill off, as the saying goes, and this is done best by keeping them in warm water till required. Next, the lip of the glass measure must be placed close to the surface of the opals when the emulsion is being poured. This prevents slopping, and avoids air bells, and also enables *a circular pool* to be formed, which will run over the surface of the glass much more easily than when such assumes every inconceivable shape. In a few minutes the emulsion will have set after being laid on the levelling plates, and the opals are ready for drying. All this work is done by ordinary gaslight.

T. N. Armstrong.

Our Editorial Table.

A Manual of Photography.

By A. Brothers, F.R.A.S. London: Charles Griffin & Co., Limited.

Mr. Brothers has had such a large and varied experience in photography that any work by him on the subject cannot fail to prove interesting and valuable. The present is a most comprehensive volume, commencing with the early history of the art, and taking us progressively up to the present time, entering with full details into the various processes now or formerly extant. The chemistry and optics of photography—the various artificial lights—the apparatus—the materials employed—the applications of photography—these and other similar topics form the divisions in this work. It is very fully illustrated, both with woodcuts and full-page examples of photogravure, chromotype, Meisenbach, examples of Boussod, Valadon, & Co.'s work, photo-lithography by Messrs. A. Brothers & Co. and others, half-tone zinc etching, Woodburytype, and several other processes. The text portion winds up with a collection of practical hints of great value. It is a handsomely printed volume and admirably got up. 364 pages.

We have received from the Fry Manufacturing Company a uranium toned print on their "Roughest" bromide paper. The subject is *Going out to Sea*, by A. J. Golding, which took a prize at the

recent Holborn Camera Club Exhibition. The negative must have been a fine one. The composition is shown by the reduced etching here given, and the picture is a charming example of the process.

RECENT PATENTS.

PATENTS COMPLETED.

Improvements in Letterpress and Lithographic Processes based upon Photography.

No. 6571. Eugene Albert, Schwabing, near Munich, Germany.—*April* 16, 1892.

This invention relates to improvements in letterpress and lithographic processes based upon photography.

Photo-lithography and half-tone blocks for the letterpress are produced as follows:—When taking a photograph of an object, a glass plate supplied with the requisite lines or grains is placed before the sensitive film, and then the negative is exposed through this net or tint. Owing to the solarisation, or extension of the action of the light sideways, being proportional to the values of lights and shades, the half-tones of the original are divided into bigger or smaller lines and points. From such a negative, composed of lines and points, the transfer on stone or metal is made, and subsequently the etching takes place in the known manner.

The result of this etching, as far as it is mechanical and without any art manipulation, is only based upon the usual big or small lines and points of the given negative according to the lights and shades of the original.

The size of the points, without regard to the character of the original to be reproduced, depends on the number of lines to the millimetre, and on the proportion of the white and transparent lines to the black and covered ones on the line plate or tint.

The number of lines to a millimetre ranges from 5 to 8; with a larger number the printing capacity of the blocks is prejudiced, and with a smaller number the richness of tone is diminished. This drawback arises as follows:—

Supposing the proportion of the white to the black line be 1 : 1, the solarisation, with a certain size of the net or tint, would no more suffice to contract enough in the lights the transparent points on the negative, while the covered point attains in the shades considerable dimensions, owing to the wide meshes of the line plate or tint. Consequently the lights, after etching, are too dark and without any effect, while in the deep tones a middle grey is observable immediately beside the completely dark. If in the net or tint the proportion of the black to the white line were altered in favour of the latter, the lights would, of course, profit thereby, but the shades would be greatly damaged. A larger black line would give better shades, but no lights.

It is, therefore, impossible to produce, by a coarse line, plate blocks of good effect and rich in tone, which would be adapted for printing on common placard or poster paper, and for illustrations of daily newspapers, &c. It is still a great drawback inherent to the photographic line plate or tint process, that good results regarding the soft and plastic shades, the tender half-tones,

and the great clear lights, can only be attained if the originals are well qualified for this purpose.

In order to always ensure the said advantages even with unfavourable originals, and with any net or tint, it is necessary to employ for the different tones of an original also different line plates or tints in such a manner that, for the shades, the black lines are larger than those for the lights, and for the lights the white lines are larger than those for the shades.

Such an ideal, impossible as it seems, can be attained by the gradual line plate, or scale net, or gradation tint forming the subject of this invention. A gradual line plate or gradation tint can be produced in different ways; but the most simple and accurate manner is the following:—

To prepare the negative for the reproduction of an original net or tint, the lens is put in communication with a screw, the revolutions of which can be controlled by a counter. The principle of this manipulation is founded on the parallel displacement of the lines. The very small degree of such displacements necessitates accurately executed mechanism, which, for instance, would render a movement of one-hundredth of a millimetre determinable.

A gradual line plate or gradation tint may be, for instance, produced and applied as follows:—

The original line plate or tint, in which the light and dark lines are supposed to be in the proportion of 1 : 1, is focussed in the usual manner, and the objective adjusted in the above-mentioned machinery. After the sensitive plate has been put in place, the exposure is commenced, which, to obtain the necessary effect for the net or tint negative, may be supposed, in this instance, to last altogether six minutes. After the lapse of three minutes, the exposure is interrupted, and the objective displaced by means of the screw to such an extent as would amount to half the thickness of the lines. Subsequently, the exposure is continued for another three minutes, and then the plate developed and fixed. Each single line of the negative thus produced has two tones, viz., a grey tone and a black body in the middle thereof. As after three minutes' exposure the objective was displaced only by half the thickness of a line on the negative, the second half of the six minutes' exposure was, for one-half of the line, a continuation of the first exposure, which accounts for the black body in the middle of the line of the negative.

If the white line on the original line plate or tint was equal in width to the black line, the displacement has now caused the grey line with black core to become broader on the reproduced line plate or tints at the expense of the white line, the proportion being now 3 : 1.

When reproducing an original by means of such a gradual line plate, or scale net, or gradation tint, the grey line forms an obstacle for all rays of least intensity from the deep shades of the original, and represents, in fact, an equivalent of the black line. The result is a broad dark line and a narrow light line in the proportion of three to one, which is favourable for the reproduction of the shades of an original.

The rays emitted from the half-tones of the original begin, corresponding to their intensity, to solarise about the grey line, while the rays from the lights are sufficiently intense to penetrate the grey line and find an obstacle only in the double film of the dark middle—that is to say, only the dark core avails for the lights; the grey line acts as if it were white, and the result is the most favourable proportion for the lights, viz., a narrow dark line and a broad light line in the proportion of one to three.

The number of scales or gradations may, of course, be increased according to the subtleness of the mechanism or size of the net or tint. The desired gradations can also be produced photographically by other means, such as, for instance, according to the above-mentioned principle of the parallel displacement of the tint lines. It is also possible to produce an original gradation tint by any suitable direct mechanical means. The desired result may also be achieved by displacement of an ordinary tint consisting of dark and white lines put immediately before the sensitive plate during the exposure of an original, or by the displacement of the sensitive plate itself. The effect of such a displacement varies for the different tones of the original, because the high lights of the original produce a correspondingly intense action on the sensitive plate in a fraction of the time of exposure, the transparent points on the negative diminishing in accordance with the amount of the displacement. On the other hand, the dark parts of the original cannot produce a chemical action in a fraction of the exposure but only during the whole time of exposure, and therefore the covered points are accordingly diminished.

The new principle may be applied to simple as well as crossed line plates or line waves, and it comprises, for the usual size of nets or tints, an important perfection of the result by mere mechanical means, while, owing to the possibility of employing coarse line plates or tints, it opens to the photographic processes for typo and lithographic prints the new domains of placard or poster printing, illustrating daily newspapers, &c.

Having now particularly described and ascertained the nature of this invention, and in what manner the same is to be performed, I declare that what I claim is:—1. A tint, single or crossed, for photographic reproductions, with any number of gradations of tone in its dark lines or line waves, which gradations may be produced mechanically when making an original gradation tint, or which may be made by photography, from a tint consisting only of dark and white lines, substantially as hereinbefore described. 2. The displacing of the screen or tint, single or crossed, put directly before the sensitive plate during the photographic exposure of a picture, or the displacing of the sensitive plate itself, substantially as hereinbefore described.

Improvements in the Method and Apparatus for Producing Magnesium Flashlight.

(A Communication by Emil Wünsche, Dresden, Saxony.)

No. 6269. Newnham Browne, 73, Cheapside, London.—*May* 7, 1892.

In photographing living subjects by magnesium light, it is invariably found that the subject or subjects are adversely influenced as regards the photographing by the flame usually employed for igniting the magnesium powder. The disturbance of the subject by this flame is frequently the cause that makes the resulting picture defective.

To obviate this disturbing influence of the magnesium light, by dispensing with a flame for igniting it, is the object sought by this new method for igniting the magnesium powder.

According to this invention, the well-known paper-cased percussion caps, or other percussion caps or detonators of a like character, which ignite with a report when struck, say, by a hammer, are employed to ignite the magnesium powder.

This method only sometimes succeeds in igniting the magnesium powder (experiments tend to show that this takes place only in about four cases out of a hundred), but these can only be deemed accidental exceptions; nor is a materially better result obtained even when the magnesium powder is strewed near to or even upon the fulminant material.

The reason why ignition of the magnesium powder by these percussion caps so often fails the inventor thinks to be this, that, when the fulminant is exploded by a blow, its ignition is too rapid to be capable of communicating itself to the magnesium powder.

The inventor's endeavour, therefore, has been so to retard combustion of the fulminant that its ignition may, with reasonable certainty, be communicated to the magnesium powder.

This he obtains by substituting for the blow of a hammer the prick of a needle, which perforates the fulminant material. In this manner a small portion only of the said material is immediately ignited instead of the entire mass, and the combustion therefrom spreads to the remainder, thus taking place more slowly, and is with certainty communicated to the magnesium powder strewed upon the cap so that the magnesium becomes luminous.

Improvements in Photographic Hand Cameras.

No. 11,394. Fox Shew, 88, Newman-street, Oxford-street, Middlesex.—*May* 7, 1892.

The invention relates to improvements in photographic hand cameras of the character referred to in the Specification of Letters Patent granted to George Lowdon, No. 4102 of the year 1885, and has for its object, first, to enable lenses of different foci to be used with such camera as well as the ordinary fixed focus lens; and, secondly, to enable the back of the camera to be adjustably held within certain limits at any angle with the front thereof.

For this purpose I make the hinged sides or wings of the camera extensible by forming them in two parts, fitted together with groove and tongue joints; and, as the substance of the wood is small, I form the tongue of metal, preferably rolled brass, which latter is provided with two or more notches, into which a spring pin is capable of entering.

Thus, when using a fixed focus lens, the sides or wings are used in their normal or non-extended state; but, when using a lens of different focus, the extensible portions are slidden outwards from the fixed hinged portions, and are locked in the required position by the spring pins.

The outer ends of the sides of the hinged portions of the sides or wings are connected together by a metal cross bar, which greatly strengthens such parts, and, in combination with a projection on the sliding parts, acts as a stop.

The back of the camera is divided into two parallel frames, the forward frame of which has connected thereto the hinged sides or wings, whilst the rear frame has connected thereto the rear end of the bellows. I also fix to each side of the rear frame a toothed rack, the front portions of which, just in front of the front frame, are formed with a hinge joint made in the body of the rack, and having the meeting faces of the leaves formed at a slight angle with each other, so as to cause the outer portions of the racks to be sprung slightly inwards towards each other, thereby causing them to have a grip on the front frame when the latter is extended, and by this means assist in holding the parts firmly together. These hinge joints also permit the racks to be folded down on to the sides or wings when the camera is packed up for transport. The front frame is provided on each side with a pinion, by which the rear frame can be extended as desired.

I also provide each of said frames with a slotted plate and a binding screw, the binding screw of each frame acting to bind the slotted plate of the other frame, and, in order to enable such slotted plates to fold within the limits of the frames, I form them of L shape, the pin joint being near the extremity of the shorter arm and the slot in the length of the longer arm.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
June 13	Darlington	Trevelyan Hotel, Darlington.
„ 13	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
„ 13	North Middlesex	Jubilee Hall, Hornsey-road, N.
„ 14	Derby	Smith's Restaurant, Victoria-street
„ 14	Great Britain	50, Great Russell-st. Bloomsbury.
„ 14	Manchester Amateur	Lecture Hall, Athenæum.
„ 14	Stockton	Masonic Court, High-street.
„ 15	Bury	Temperance Hall, Bury.
„ 15	Manchester Camera Club	Victoria Hotel, Manchester.
„ 15	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
„ 15	Portsmouth	Y.M.C.A.-buildings, Landport.
„ 15	Southsea	
„ 15	West Surrey	St. Mark's Schools, Battersea-rise.
„ 16	Brixton and Clapham	Gresham Hall, Brixton.
„ 16	London and Provincial	Champion Hotel, 15, Aldersgate-st.
„ 16	Oldham	The Lyceum, Union-st., Oldham.
„ 17	Cardiff	
„ 17	Holborn	
„ 17	Leamington	Trinity Church Room, Morton-st.
„ 17	Maidstone	"The Palace," Maidstone.
„ 17	Richmond	Greyhound Hotel, Richmond.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 2,—Mr. A. Cowan in the chair.

AMERICAN VISITORS.

Miss Catharine Weed Barnes, New York, Mr. J. Carbutt, and Mr. F. E. Ives, Philadelphia, were present at the meeting to which they were welcomed, in a brief speech on behalf of the members by Mr. J. Traill Taylor. At a later stage of the proceedings,

Miss BARNES, in reply to the Chairman's invitation to speak, said she had come to the meeting to learn and not to teach. She was anxious to take back as much of the country on her plates and to do as much with her camera as possible during her stay. She regarded it as a great privilege to be present. She had had the pleasure of seeing some partial tests of Mr. Dallmeyer's tele-photo lens and was exceedingly interested. In the April number of her magazine (the *American Amateur Photographer*) she had reproduced some illustrations done by means of Dr. Miethe's tele-photo lens, but she had much wanted to hear Mr. Dallmeyer's side. As an American she loved fair play and liked to hear both sides.

THE BLACK FLASH—REVERSAL.

Mr. J. S. TEAPE referred to Mr. Clayden's experiments which had been carried out to endeavour to prove the cause of the black flash in lightning discharges. Mr. Clayden had given a plate a short preliminary exposure and then exposed it to the electric spark; on that plate he had obtained no reversal—that is, he obtained a positive image, as was to be expected. He also exposed part of the same plate, which had had no preliminary exposure, to the same spark, with no sign of reversal. He then exposed a plate to the electric spark first, and gave a subsequent faint exposure, and always obtained reversal of the image. He (Mr. Teape) had made some experiments which were beyond doubt very exact, as they were all on one plate. He took an Ilford ordinary plate and first wanted to find the amount of light which would give reversal. He covered it with an opaque screen with eight openings in it, and exposed from one-inch to eight inches of magnesium to it, at twelve inches distance, and of course found where the reversal was obtained. One inch gave a faint sign of reversal and three inches clear glass. He took another plate and covered half of it with opaque material, and gave a preliminary exposure of one-quarter of an inch of magnesium at four feet distance, and then put it behind the same screen. Wanting to find out whether the subsequent or preliminary exposure hastened reversal, he gave an exposure to start with a little less than had actually produced reversal on the test plate. He started with three-quarters of an inch at the same distance, and gave the same exposure to the same opening of each half of the plate: three-quarters of an inch, one inch, one and a half inches, and two inches. To the covered-up half, which had had the preliminary exposure, he gave a quarter of an inch at four feet as a supplementary exposure. Developing with Thomas's hydroquinone developer for five minutes, he found no difference whatever in the three results—subsequent, preliminary, or simple exposed plate. He was quite unable to account for Mr. Clayden's results.

The CHAIRMAN observed that those results had not been borne out by Mr. Teape's experiments.

THE TELE-PHOTO LENS.

Mr. T. R. DALLMEYER said that, as the tele-photo lens had already been fully described, he did not propose to give a set paper on the subject, but he would show them a number of results which had been produced by it. It was well understood that a negative lens to increase the size of an image was employed many years ago in connexion with telescopes by Peter Barlow. That lens was of considerable use, but the limits within which it could be used for purposes of enlargement were certainly small. The first lens in which a negative element of moderate power was employed was the orthoscopic lens of Petzval. In that lens he employed a positive front element, which was very much under-corrected for positive spherical aberration, and corrected it by the back lens. The negative lens in the orthoscopic was of larger focus—about twice—than the positive element. The orthoscopic gave a magnification equal to that of a longer-focussed lens. It was originally intended for the cure of distortion. The next movement was in connexion with Derogy's lens. He employed between the two elements of a portrait combination a moderately powerful negative lens actuated by rack and pinion, which gave a certain amount of choice as regards focus. The next step was in connexion with Dallmeyer's triple achromatic, the negative being placed between the two lenses in a fixed position, and absolutely curing distortion. He believed this was the first lens in which distortion was absolutely cured. Having described the first form of tele-photo lens which he had introduced, he said that in the new lens the positive element, instead of being of a single cemented aplanatic form, was a complete portrait combination, corrected as far as practicable throughout its whole field. The negative element was a symmetrical combination, also aplanatic. When the rays from the positive element met the negative element they were corrected very well throughout a large field and distortion was reduced to a minimum. Analysing this negative lens, they would find it a large fraction of the front as regards focus. The negative lens was of large aperture and short focus, and took in a comparatively large angle. With a smaller aperture and longer focus the angle and rapidity would be much reduced; with a bigger negative instrument the angle included would be very small. A feature of the back combination of the portrait lens was that by moving the back lens correction for near and distant objects was obtained. The lens could be always worked at full aperture with perfect sharpness on all planes. He had prepared a table of various extensions of camera and the corresponding foci, giving the circle of illumination and intensities at full aperture [see p. 377]. As to the higher degree of magnification claimed for Dr. Meithe's lens, it was a simple matter to use an exceedingly small and high-power negative but the loss of light and rapidity was so great as to make it absolutely worthless to cover any angle. They could never think of making an instantaneous exposure with it. In conclusion he said he believed the "sensuous impression" conveyed by the tele-photo lens was appreciated. They got an image equal in size by going nearer with a short-focus lens, but the perspective would be wrong. By getting farther away they did not get this exaggerated perspective.

Mr. Dallmeyer handed round some pictures taken with the tele-photo lens by Mr. McKenzie, of Glasgow, together with some of the recent eclipse. In reference to a batch of negatives which he also passed round, he indicated some to show that density could be obtained without difficulty in these enlarged pictures.

Mr. J. TRAILL TAYLOR said Mr. Dallmeyer had given Derogy credit for introducing a negative combination, but he (Mr. Taylor) would like to place it on record that the first to introduce it in this country to lengthen the focus of a lens was the late Frederick Scott Archer; Goddard was the first to improve upon Sutton, who introduced a negative lens to flatten the field and cure distortion, the negative being placed in the centre of two achromatised plano-convexes, Goddard making the positive lenses of a meniscus form. The Photographic Society of Scotland had tried it very carefully, and it was the only lens they had access to which gave absolute freedom from curvilinear distortion. As a set-off to this, however, it had a diabolical flare spot. There was something Mr. Dallmeyer had forgotten to say, and this was, that he had made his amplifying lens with its first surface convex, and that rays from the portrait combination fell upon it normally. There was a considerable difficulty in getting vigour and force in negatives taken from a distance, owing to aerial perspective. He had had a deal of difficulty to cope with in getting vigour, on account of tremor or waviness in the atmosphere caused by the heat from the chimneys. He recommended those who tried this lens to keep away from London as much as possible.

Mr. W. E. DEBENHAM said that Mr. Dallmeyer said it was impossible to correct a lens for near and distant objects. What would he call a near object?

Mr. DALLMEYER said the other side of the room. The lens was considerably used for life-sized objects. Mr. Taylor's lens was of the Petzval form, which might account for the defect he complained of.

Mr. TAYLOR observed that Mr. Dallmeyer would not recommend the negative attachment for use with a rapid rectilinear lens, but he (Mr. Taylor) had tried it and found it answer wonderfully. It was a mighty improvement with regard to portability, but he had to pay for it by giving a longer exposure. The drawback was that one had to make the adjustment once for all. Could Mr. Dallmeyer suggest how to get over the difficulty?

Mr. DEBENHAM said Mr. Dallmeyer had said that the use of a diaphragm would make the field much smaller. Suppose the diaphragm was close against the negative lens?

Mr. DALLMEYER said little benefit would be got from that, as the angle would still be reduced.

Mr. DEBENHAM said that, in regard to tremor, there was another cause than heated air, and that was from the tremor of the instrument itself or the camera.

Mr. DALLMEYER said that with the tele-photo lens a draw of camera eighteen inches represented a focus of seventy-two inches.

Mr. DEBENHAM considered it desirable to impress upon users of the lens to have a rigid stand and not use it when the wind was about. He had examined the lens and found that the field was distinctly convexed.

Mr. J. CARBUTT having exhibited the Genie hand camera and the Henry Clay 7×5 hand camera, as well as some very large pictures taken on his films, votes of thanks were passed to him and Mr. Dallmeyer, and the meeting closed.

Holborn Camera Club.—June 3, Mr. R. Luxton in the chair.—Mr. WEST opened a discussion on *Landscape Photography*. He confined himself strictly to artistic productions. He did not for one moment think photography was a high art—it was impossible to be so; but a man with a little bit of the artist in him, and who was conscientious in his selection of the subject and the way he carried it through the after-processes, might, if not to make photography a high art, very near approach it. He proposed to give them his idea of the composition of a landscape picture. A picture should appeal to one's artistic feelings, and a knowledge of composition was very important if a picture was to be turned out. He put the chief rules of composition before those present, and gave illustrations which clearly interpreted those rules. He made a special point of the three planes, foreground, middle distance, and extreme distance. He gave a few hints on exposure, and then dwelt on the developing portion of our work. A perfect knowledge of the capabilities of the different solutions which formed the developer was essential. He gave broad lines for proceeding to develop; but, as every plate required a different mode of treatment, it was extremely difficult to give information on strict lines. They must go cautiously to work. The last and most important part was the printing of the negative. Whether it was printed in bromide, silver, matt surface of glossy, it should suit the subject. The chief end in photography was the finished print. What did it matter if the negative was not technically correct if the resulting print was right! An interesting discussion followed. Mr. Raphael showed a hand camera called the "Surprise," which had a very original changing arrangement. Members are requested to take notice that the Pinner outing is postponed to the following Saturday, June 18, the the members being invited to a tea at the "Green Man," Mill Hill (Edgware), on Saturday, June 11, by Mr. C. O. Burgess, the President of the Holborn Cycling Club.

South Manchester Photographic Society.—May 30, Mr. W. I. Chadwick in the chair.—Messrs. J. Aitchison, jun., and J. Wild were elected members. The CHAIRMAN presented the Society with an enlarging lantern, and, in the course of his remarks, said that, although bromide enlargements were very nice if well done, still he did not think that the results could compare with those obtained either by the platinotype or carbon processes. The thanks of the Society were awarded to Mr. Chadwick for his present, and Mr. Linnell, in proposing the same, said he hoped the members would make good use of it. Results of the Millers' Dale ramble were then shown by several of the members, chiefly in the form of stereoscopic transparencies, and were pronounced to be very successful. Mr. Linnell also exhibited the negatives which were taken on Edwards' films, and, in the discussion that followed as to the relative advantages of films and glass, it was proved that results were quite as satisfactory, and, as regards the weight, one dozen 6½×4¼ films, with packing, weighed five ounces, whereas one dozen plates same size weighed forty ounces. In one case

he cut the film in two, and transposed the parts, with the result that a stereoscopic transparency could be obtained from one printing. Messrs. Mawson & Co.'s "Radial" and "Metal Miniature" hand cameras, along with Hurter & Driffield's actinograph were laid on the table for the inspection of the members. Specimen photographs on Fry's roughest bromide and soltype papers were also shown. Exposure notebooks sent by Messrs. Mawson & Swan were distributed. In the absence of Mr. Wilkinson, the Secretary exhibited the Beard-Pringle lantern, which was very much admired for its compactness. Slides done by the members were then projected on to the screen by its aid, some of the work being very good. An adjournment was then made to the lecture-hall, when some beautiful flash-light pictures taken behind the scenes during the two last pantomimes at the Comedy Theatre by Mr. Wade, President of the Manchester Amateurs, were shown by aid of the lantern, and some American views brought by the Chairman.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

HELIOCHROMY.

To the EDITOR.

SIR,—From your issue of June 3 I learn that Mr. Ives continues to judge of my process of heliochromy from faulty translations of my paper of 1885, and maintains his assertion that the friendly, cordial, *private* correspondence over orthochromic matters between Professor Himes, Philadelphia, and me, should have been an official one, in the name of the Franklin Institute.

In reply to this I remark that, if I could have known that my private correspondence would have been recognised as an official one, I would have given Mr. Himes much more information for the decision of the priority than I have done. Therefore the verdict of the Franklin Institute in the matter is valueless for lack of full information from my side.

Mr. Ives asserts that he has published "the first successful method" for taking orthochromic pictures by the chlorophyll process, and degrades mine. I answer that I published already (1883), six years before Mr. Ives, my method for taking colour pictures successfully by corallin and collodion; that (1878) Ducos du Hauron, in his "Traité pratique de photographie en couleurs," Paris, Gauthier-Villars, p. 24, published a chlorophyll process one year before Mr. Ives. Ducos du Hauron gave up this chlorophyll process *in favour of the eosine process* Mr. Ives degrades.

Indeed, all reproduction galleries of Europe and America work with the eosine process, or the eoside of silver process, but nobody with Ives' chlorophyll process, which has only an historical interest on the other side of the water, in circles where European investigations are ignored in favour of American ones.

Mr. Ives asserts further that he already published his new (?) process of photography in natural colours in 1888. I reply that my process was published in my book, mentioned on page 318 of this JOURNAL, already three years before Mr. Ives'. The fact remains uncontradicted that Mr. Ives totally misunderstood this process of mine, and has given a totally wrong description of it in the *Journal of the Franklin Institute*, January, 1891.

It is also wrong if Mr. Ives says that I "ignore the heliochromoscope altogether." On the contrary, I acknowledged it, p. 318 of this JOURNAL.

At the end of his letter, Mr. Ives says, "Dr. Vogel has a right to quote . . . . the *only* unfavourable expression of opinion of my lantern projections," &c. In reply to that, I call the attention to a second unfavourable expression over Mr. Ives' performance in the *Photography*, p. 292, wherein it said, "We must confess we were somewhat disappointed," &c.—I am, yours, &c.,

DR. H. W. VOGEL.

Berlin, June 5, 1892.

To the EDITOR.

SIR,—In his reply to my article entitled, "Projections in Natural Colours," Mr. Ives makes some statements which go wide of the mark.

First, He commences by asserting that he did *not* use red, yellow, and blue glasses in 1888. As I have never stated that he did so, this assertion is quite uncalled for.

Second, He states that he did not then use three lanterns but one lantern, with three optical systems close together and a triple jet. I presume by a triple jet he means an arrangement of three limelights controlled by one pair of taps. This bears out my statement that he used three complete lantern systems with three limelights, what is generally called a triunial or triple lantern.

Third, He says he did not use three slides, but one slide carrying the three pictures. As his negatives were on separate glasses, it is clear that the transparencies were also on separate glasses in order to admit of correct registration, hence he must mean that the three slides were mounted in one frame. This is practically admitting that his three positives were on three separate glasses, which was what I stated.

Fourth, He states that he tried making the negatives ten years ago on a single plate, but abandoned the plan in favour of separate glasses for the three negatives. This proves my statement, that In 1888 he was making each set of negatives on three separate glasses. It also proves that, prior to the publication of my improvements, he had not grasped the principle that the position of the three pictures photographed simultaneously on the one plate was precisely that which was required in order to secure perfect registration of the images on the screen. For example, in a view including a flagstaff it is obvious that the lines representing the flagstaff must be absolutely parallel to each other in the three positives. This parallelism is secured in the most perfect manner by taking the three pictures on the one plate simultaneouly.

After the publication of my improvements, Mr. Ives entirely altered his method of working. In June, 1891, he exhibited the new arrangement at the Franklin Institute. According to a report relating to this, "when Mr. Ives first published his process several years ago, the three negatives requisite were made in one camera from one and the same point of view, but last night he showed that, by an improvement on his heliochromic camera, the three negatives are now not only made from one point of view by simultaneous and equal exposure, as they were three years ago, but also upon a single sensitive plate. . . . The lantern front used for these new projections consisted of three prisms, converging light from a single condenser, and radiant to three small projecting lenses." The latter sentence indicates that he was then using a lantern employing a single source of light for projecting several pictures, an idea which he admits originated with myself.

Mr. Ives is welcome to adopt my improvements in his own country; but, when he exhibits his results in England without giving the slightest hint that there are patent rights attached, it is needful for me to protest.

Mr. Ives asserts that the process has failed in my hands, because the three images, being taken from slightly different points of view, will not perfectly register on the screen. Six months ago I devised an arrangement of lenses whereby the pictures are taken from points of view only half an inch apart, so this small defect is corrected.

Mr. Ives' heliochromic process and Scott's "Verak" system are now practically one and the same thing; so, if the one is a "failure," the other must be a failure also.—I am, yours, &c.,

ALBERT W. SCOTT.

401, *Cowbridge-road, Cardiff.*

To the EDITOR.

SIR,—In your issue of May 13 appears a letter from Dr. H. W. Vogel, objecting to my remarks about Mr. F. E. Ives in a lecture on April 5 last, as follows:—"When, about thirteen years ago, Mr. Ives undertook to reproduce, by means of photography, the colours of nature, he fully realised that no light task was before him."

In stating that this remark is strictly true, I wish to add that, if Mr. Vogel will now undertake to produce results equally as true to nature as those recently shown by Mr. Ives in London, I am quite sure, if he will ignore entirely the ingenious devices of Mr. Ives in colour photography, he will find that he has "no light task before *him*." Until then, "'nuf ced."—I am, yours, &c.,

W. N. JENNINGS.

Franklin Institute, Philadelphia, May 27, 1892.

THE CONCENTRIC LENS.

To the EDITOR.

SIR,—I gave you the result of the trial of the new concentric lens some weeks ago, and since then have had the lens opened up to *f*-11 and *f*-13, and send you impressions of the negatives obtained. With *f*-11 the focussing is difficult—why I cannot say—and naturally there is not the same range in the depth of the focus; but *f*-13 works perfectly, and, though No. 3 is a poor print, you can see that the definition is as good as need be, and the exposure—the shortest I could get with the convenient little shutter of Perkin, Son, and Rayment—gives me figures in motion, and if I could have diminished the exposure considerably it would still have been enough. I get so little time for experiments that I have not been able to make another trial with an opening of *f*-16, which I think would be sufficient with the same conditions. In No. 1 (*f*-11) the extreme distance is woolly, which is not the case always with that stop; but I cannot say why. I suppose the reason is that the granulation of the focussing screen is too confusing, for I find it very difficult to determine the focus for the granulation when I employ the magnifier, and find it safer to focus without it. Then with films I am not sure of the exact focus, as they sometimes curve a little; not enough to do any harm in ordinary cases; but with the stop of *f*-11 a very little variation does harm. We have no plates of English sizes here, and my camera does not take the French conveniently, so I am waiting for some good English plates to try the next experiments.

But I should advise those who wish to use the concentric for very short exposures to have it opened up to *f*-12, which it will bear perfectly for practical purposes on an angle of about fifty degrees, maintaining all the qualities of the lens. Nos. 1 and 2 were taken with the components separated about a half millimetre beyond the normal, but No. 3 with them in their proper place; and you will see the effect on the illumination, which is much more equal in the last. The lens is a seven-inch.—I am, yours, &c.,

W. J. STILLMEN.

Rome, May 29, 1892.

"COSMOS."

To the EDITOR.

SIR,—As one of the junior members of the London and Provincial Photographic Association, who are supposed by "Cosmos" to suffer from severe snubbings week by week, permit me to deny the truth of his assertions if applied to our Society. I look to the London and Provincial as my most valuable source of technical information, and I am bound to say I have always found our old and best-informed members ready to assist in solving a difficulty, even at the expense of considerable trouble to themselves. In linking Mr. Haddon's name with his gibes, your contributor is singularly unfortunate, because Mr. Haddon's reputation, as one who has made many valuable suggestions to photographers, is sufficient to refute the ungenerous sneer. And here, by the way, let me remark that Mr. Haddon's advice to amateurs, to make collodion positives for their friends, was rather for the benefit they would derive in studying the process. As further recommendation, he mentioned it might help to mitigate the injury done to professional photographers, and remove this slur from the amateur's name. But, reverting to the attack on old members of photographic societies, I would like to point out a remarkable contradiction. The credibility of a witness is dependent upon his truthfulness. What does "Cosmos" say to these quotations from his modest little jottings?—

THE BRITISH JOURNAL OF PHOTOGRAPHY, May 13, page 309:—"Not long ago I was present at a meeting of a photographic society."	THE BRITISH JOURNAL OF PHOTOGRAPHY, June 3, page 356:—"I have said I never go to any of the Society's meetings. Though once an *habitué* of several, I placed myself on the permanent absentee list several years ago."

Really, Mr. Editor, some persons should have long memories.—I am, yours, &c., JUNIOR.

London, June 4, 1892.

To the EDITOR.

SIR,—"Silver Bath" is pleased to inform "Cosmos" that in this particular case he does not live in a glass house, also to tell him that some old photographers were perfectly competent to verify the quality of the chemicals they bought. The average photographer of the early times knew much more about the materials he used than one of the present date, but if he trusted at times to the honour of so-called respectable dealers, and was deceived, where lies the blame? "Silver Bath" knew thirty years ago that silver nitrate was largely adulterated with potash nitrate, but this article was usually offered at a lower price to tempt the unwary; he knows that he did not fall into the trap. As he commenced photography nearly fifty years ago, he cannot be considered a tyro, and he does not wish to occupy space in THE BRITISH JOURNAL OF PHOTOGRAPHY to prove what was well known—the advantage of the use of recrystallised silver nitrate in making the bath over the commercial article.—I am, yours, &c., SILVER BATH.

June 7, 1892.

PHOTOGRAPHIC PRINTERS.

To the EDITOR.

SIR,—I have read with great interest your article and correspondence on "Photographic Printer." I am an operator, and find it equally as difficult to obtain a berth in that capacity as "Unfortunate" does as a printer. Now, I am not one to content myself with plodding along anyhow, but have made a careful study in all branches of operating, and have obtained the highest and most flattering of references from good firms, which testify to my skill as an expert photographer. If all employers were like your correspondent L. Hubert, I would have no difficulty in finding a berth. I am a competent operator, but not a first-class retoucher, worker in monochrome, water colours, black and white, &c. How can employers expect a man to have mastery over so many branches, as is too often required? Then, again, will not employers engage a man of thirty-five years of age who has taken up photography the last five in preference to another who, perhaps, is blessed with more brain power, and has eight years' experience, but is only aged twenty-five? The question is, Are testimonials of any use, and will age give brains? Is it not a fact, Mr. Editor, that a smart, energetic man will learn more in five years by exercising common sense and brain power than another who plods along in a mechanical sort of way for twenty years?

I have often had my application for a berth returned to me written across, "Not old enough for experienced operator," in spite of my exceptional references I am, unfortunately, only twenty-five years of age.—I am, yours, &c., AN OPERATOR.

June 4, 1892.

To the EDITOR.

SIR,—I notice in your last issue two letters from correspondents in reference to printers, in which one gentleman states no good worker need ever be out of work; but I beg to differ on that point. I am a printer (silver and platinum) with several years' reference from a leading high class photographer in London. For several weeks I have been out of employment. During that time I have advertised occasionally. The answers I often got were, "Thanks; your price is too high."

Now, sir, what kind of men do employers expect for the salary they offer? If they were to pay a fair and reasonable salary, they would have no difficulty in obtaining a good man; but, of course, they engage the cheapest men, and get the "incompetents and duffers," and then complain of being unable to obtain really good workers.

It is quite true there are vacancies every week, but not the vacancies an experienced man would apply for. The majority are as follows:—"Printer wanted, one able to operate and retouch preferred." After sending *carte* of self, specimens, and reference, they offer the enormous salary of 1*l.* per week, which barely keeps starvation away.—I am, yours, &c., F. L.

June 6th, 1892.

ORTHOCHROMATIC PHOTOGRAPHY.

To the EDITOR.

SIR,—I shall be glad if you will announce that the next ordinary meeting of the P. S. G. B. will be held here on Tuesday, June 14, when Dr. J. J. Acworth, F.J.C., F.C.S., will read a paper entitled "Orthochromatic Photography," with experimental illustrations.—I am, yours, &c., R. CHILD BAYLEY, *Asst.-Sec.*

50 Great Russell-street, June 4, 1892.

CORRECT EXPOSURES.

To the EDITOR.

SIR,—It is hardly fair to ask you for space to reply to Mr. Alfred Watkins' letter on this subject in your last issue, because, my reply will only amount to a repetition of my former statements on this question.

Mr. Watkins states my contention that a large amount of subject will transmit more light to the plate than a small amount quite correctly, but it seems an easy way of refuting that contention to state "the fallacy of Mr. Michael's argument is, in assuming that a large amount of subject will transmit more light to the plate than a small amount." Mr. Watkins makes no attempt to show wherein the assumption is fallacious, neither does he point out wherein the example I gave in my former letter is theoretically wrong.—I am, yours, &c., M. J. MICHAEL.

June 6, 1892.

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

To the EDITOR.

SIR,—I have the pleasure to enclose a further list of papers to be read at this year's meeting of the Convention at Edinburgh, which I hope you will publish for the convenience of those of your readers who are members. Professor W. K. Burton and Mr. F. M. Sutcliffe have also promised contributions, but the title of their papers are not yet to hand.—I am, yours, &c., F. P. CEMBRANO, JR.

The Art of Photography in Relation to Painting, by Mr. A. Burchett.
Direct Silhouette Portraiture (with lantern illustrations), by Mr. J. Cox.
On the Training of Photographers, by Mr. E. Howard Farmer.
The Use of the Colour Screen in Landscape Photography, by Mr. Charles L. Mitchell.

10, Cambridge-gardens, Richmond, Surrey, June 2, 1892.

CHRONOPHOTOGRAPHY.

To the EDITOR.

SIR,—An article on "Chrono-Photography of Star Transits" in the last-received number of the JOURNAL (May 13) prompts me to send you a pamphlet which may prove interesting to you and to your readers who have at heart the application of photography to scientific research.

The Observatory publication will explain itself fully. The authors, I believe, intend to bring out, in June or July, a report of still further applications of their Photochronograph, practically and theoretically successful.—I am, yours, &c. J. A. S. BROSNAN, S.J.

Woodstock College, Woodstock, Howard Co. Md., May 24, 1892.

[The work in question gives an illustrated description of the photochronograph employed, and details the results of a number of experiments made in photographing transits.—ED.]

Exchange Column

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Hand camera wanted in exchange for a brand new (patent) landscape whole-plate camera worth 7*l.* 10*s.*—Address, SEWELL BRADY, 1, Hungerford-villas, Long Ditton, Surrey.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

R. C. PHILLIPS.—Thanks. In our next.

PASTE.—Omit the acetic acid from your paste.

G. C. HANCE.—The sensitising solution named will answer for canvas.

SENOJ.—Better precipitate the gold by protosulphate of iron, and then redissolve it.

A LEVY.—We do not think that the lens mentioned would be at all suitable for your purpose.

RANGER.—Appliances for carrying hand cameras on tricycles are sold at most cycle warehouses.

OTHELLO.—1. The lens is of trifling commercial value. 2. Millet was the name of the maker.

MERCURY.—See the paper on "Photographing on Wood," by Mr. W. J. Rawlings, published in the JOURNAL of April 8.

MORTIMER FIELD.—The Meisenbach Company, of West Norwood, will probably be able to supply you with the kind of zinco blocks you require.

X. O. Z.—If only three sheets of paper can be toned with a fifteen-grain tube of chloride of gold, it shows that it does not contain the proper proportion of gold.

W. BOROUGH.—Mr W. T. Wilkinson has, we believe, recently brought out a work on the subject, published probably by Messrs. Iliffe, St. Bride-street, E.C.

ALF. A.—The prints in question are collotypes varnished with an aqueous solution of shellac, which gives them the appearance of being silver prints on albumen paper.

S. C. J.—You certainly have paid a very low price for the lens; but it does not follow that all low-priced lenses are incapable of producing good work. Yours may, perhaps, prove one of the exceptions.

T. SEDGWICK.—The spots on the films are due to the emulsion. It is no fault, as asserted, in the manipulation. There is no way of avoiding the evil in the development, as it exists in the film before the developer is applied.

J. E. LINDSAY.—If you wish to take landscapes only, and obtain the best results, by all means take a half-plate or larger camera, and work it on a stand. For this class of work excessively rapid exposures are of no advantage—often the contrary.

O. Q. P.—The cause of the converging perpendicular is that the camera was tilted when the negative was taken, and the swing-back not brought sufficiently, if at all, into use. This is not an altogether uncommon fault with some foreign views.

C. BINGLEY.—You are quite under a mistaken notion as regards the wet-collodion process for portraiture. For quality of results, that process has not yet been eclipsed, except in the matter of exposure. Yours is by no means an isolated opinion amongst modern photographers.

H. PAYNE.—Vulcanised rubber is useless for making a solution of indiarubber. Get some "masticated rubber," and dissolve in benzole to the consistency required. The simplest way to obtain a solution is to purchase a tin of rubber solution or paste, such as is used for repairing indiarubber goods, and thin that down with benzole.

BERTROS.—With your experience and credentials you would, we think, find the best opening in one of the smaller towns at the Cape, such as Johannesburg or Pietermaritzburg; there would be far less chance for you at the other places you name. The risks of finding an opening on arrival are so great that we cannot advise you thereon.

B. R. U. M.—Yours is quite a case for the gentlemen of the long robe. If you have been sold the business under a misrepresentation of the facts, and find the receipts were not anything like they were stated to be, the law will certainly give you redress. Until you have had legal advice, we should recommend you to withhold any further payments.

"R. A." feels aggrieved because we, in a sub-leader a few weeks back, said that many artists use photography largely to aid them in their work. It is a fact, nevertheless. Some pictures, by "good names" too, have been painted almost entirely from photographs. Of course painters do not admit this, but there is no reason why they should decry photography.

B. RAYMONT writes: "I have often seen it stated in print that by filtering a solution of brown shellac in methylated spirit, such as used for negative varnish, through animal charcoal it will be decolourised. I have tried this several times, but always found that no colour was removed. Where have I failed?"—It is a fallacy. The alcoholic solution of shellac is not decolourised by filtration through charcoal.

HANTS, writing in relation to a paper recently read before one of the London photographic societies, asks, when any one undertakes to read a paper on any subject with which it is well known he is familiar, if he should not give some details of the methods of working, instead of leaving that portion of the subject in the dark.—All we can say is that a little of the practical side of the question would have been very acceptable to the majority of those who were there. But, of course, it rests with the readers of papers as to what they will say. The societies cannot stipulate as to how the different subjects shall be treated. They, in most instances, are glad to get papers of any kind just now.

MELTONIAN asks, "Which is the best gelatine for Woodbury printing?"—If our correspondent means for printing the impressions from the metal moulds, then any gelatine of a strong kind that will set quickly will serve. But, if making the gelatine reliefs is meant, then one of a different character must be used. The "Amber" gelatine of Messrs. Nelson, Dale, & Co., is the one most generally employed for that purpose.

R. J.—The mere fact that the photograph bears the word "copyright" on the imprint is no proof that there is a legal copyright in the picture, or even that it has been registered at Stationers' Hall. However, it is illegal to attach the word copyright to a photograph that has not been registered, as it is misleading. It must be borne in mind that a photograph may be registered and yet not be legally copyright if the matter were tested in a court of law.

G. A. H. writes as follows: "I have been told that if a diamond cut is made in a piece of glass, and the glass is not separated at once, the cut will heal up, so that after a few days the glass cannot be divided where the cut was made. Will you kindly tell me if this is a fact?"—We have more than once heard the same thing asserted, but have never put it to the test of experiment. The thing is easily tried—perhaps our correspondent will make the experiment and let us know the result. Possibly others will like to try it.

R. TAYLOR asks how mirrors which are fixed at an angle of 45° in front of the lens for taking reversed negatives are made, and whether thick plate glass or patent plate is best, and whether the glass is silvered on the back or the front, and how?—Commercial plate, or patent plate, glass is not reliable for the purpose. The glass should be optically worked, so that it has an absolutely plane surface. Unless this is the case, anything like perfect definition will be impossible. The glass is silvered on the surface that is the one nearest the lens. Formulæ for silvering the glass will be found in any of our ALMANACS.

J. C. P. has a very old photograph to copy which is much tarnished, and wishes to know how to clean it and restore it as far as possible before copying. It is on zinc or some similar metal. He tried one lately that was very much tarnished, and as soon as he placed it in a tray of clean water to soak the whole of the film broke up. However, it was very frail when he received it. This one seems all right on that score, but he is afraid of it after his experience with the other.—From our correspondent's description of the picture we are unable to identify it. If he will send it for our inspection, we shall probably be able to assist him.

S. MOORE, who says he is a novice—and we have no reason to doubt him—sends us several negatives for advice thereon. They are marked, have large transparent holes in them, and are covered with mottled stains. He asks if the defects are due to the plates or to his work.—The latter decidedly. The marks are due to the plates not being covered with the developer when first immersed in the solution. The cause of the spots is air-bubbles adhering to the film while in the developer. The mottled stains arise from the dish not being kept in motion while the development is proceeding. The various causes of trouble being indicated, the remedy is obvious.

WEST LONDON PHOTOGRAPHIC SOCIETY.—June 11, Watford. Cycling division meets School of Arts, 2.30 p.m. Tea at "Essex Arms."

WE have received the summer supplement to Vevers' catalogue, which embodies in a handy form particulars of new apparatus and sundries.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—At the next meeting of this Society Mr. J. Traill Taylor will discourse on *Lenses Ancient and Modern.*

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—June 16, *Some Prime Factors in Exposing*, Mr. Howard Farmer. 23, Annual General Meeting.

THE PHOTOGRAPHIC CLUB.—June 15, *Platinotype Possibilities.* 22, *The Relative Permanency of Prints by the Various Methods in Present Use.* Outing, Saturday next (18th), Burnham Beeches. Train from Paddington at twenty minutes past two.

MESSRS. B. J. EDWARDS & Co. inform us that they are being repeatedly called on to furnish instructions for dissolving one ounce of eikonogen in thirteen ounces of water, that being the proportion given on page 800 of the 1892 ALMANAC as their formula for eikonogen developer. We regret the printer's error. The correct formula is as follows:—Eikonogen developer, for isochromatic plates: No. 1. Distilled water, thirty-five ounces; sulphite of soda, two ounces; eikonogen, one ounce. No. 2. Distilled water, ten ounces; carbonate of potash, one ounce. For use, mix one part of No. 2 with three parts of No. 1, and (when new) add to each ounce of the mixture two to three drops of a ten per cent. solution of bromide of potass. The developer can be used repeatedly by adding more No. 1 and 2, omitting the bromide.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1676. Vol. XXXIX.—JUNE 17, 1892.

DUST.

One of the most fatal enemies to good and clean photography is dust in one or other of the many protean and often unexpected forms in which it presents itself in photographic practice. It will not be time ill spent to take into consideration some of these cases, their prevention and cure. We naturally first turn our thoughts to the apparatus employed, first, of course, being the lenses. Old readers of this Journal do not need to be reminded of the number of times we have pointed out how necessary it is, first, to protect all lenses from dust; and, secondly, to use great care in removing it when after all precautions it has gradually settled upon the glass surfaces. For field work, when the camera is only occasionally employed, it will often be found necessary to remove a slight film before use, yet this necessity might in the main be obviated if the instrument were provided with two caps instead of one. It may be supposed that the reason why two such protections are not provided by the maker is the extra price that would have to be put upon the instrument—an important consideration in these days of competition and low prices. It should be remembered that dust will find its way into almost every case, drawer, box, or other receptacle used for containing lenses, while the universal velvet-lined cap is an almost perfect protection. There is something to be said in favour of the old metal caps, formerly the only kind employed, for they fitted dust-tight against the lens. When the lens is a practically complete fixture to the camera, as in studio work, covered and uncovered by an internal shutter, it is often customary to leave it unprotected, and occasionally to wipe its surface, but such treatment of a valuable instrument is as unwise as unfair to the maker; it should always be capped when not in use, although there be a complete closing and unclosing arrangement inside the camera. When lenses are put away they should, further, be always dusted with a soft camel's-hair brush to remove any particles that may have become attached while they have been in use, for "dust" being of very varied constitution there may, possibly, be some adherent spot capable of acting as a nucleus to collect other injurious particles not easily removed, or that would scratch the surface during removal.

All lenses, moreover, will need occasional (but only occasional, when ordinary care is used) unscrewing and internal cleaning, owing to the deposition of particles of dust, so fine as to partake more of the character of a stain than a collection of small particles. If this film, for such only can it be called, be not removed, it will be found that under some conditions of light it will mar the crispness of the shadows, and tend to flatness of image. The fact is, this film becomes actually illuminated in a strong light, and so gives off rays which reach the whole plate; if a bright light shine on the lens, and a badly illuminated object be photographed, the effect is sure to be brought about.

Now, as to the removal of these film-like deposits, as well as more grossly visible particles. The only secret in practice is first to remove the loosely adherent particles by means of a brush, and then to polish the surface. For this latter purpose nothing but the softest possible material should be used, some preferring washleather, others an old linen cloth. If the former be chosen, it must first be well washed, to remove the lime dressing, and also be occasionally washed afterwards, to remove any possible gritty particles that it may have collected, and which, being unseen, might injure many surfaces before being discovered. On this account alone there is much in favour of the contention of those who say that nothing but old linen should be used, and that, after employment a few times, it should be discarded, and replaced by a new one, which would be readily done, as the cost is *nil*.

On no account whatever should rouge putty powder or other polishing material be used, except by an expert, for he only knows when it is of the right kind or how to use it. A lens, when sent out from the workshop of a good maker, has a surface of exquisite polish, which can easily be injured, and the loss of which is so much off the value, commercial and practical, of the instrument. If any one examine hap-hazard a dozen lenses belonging to amateurs of average carefulness, and that have been in use a few years, it will be surprising if he do not find more than one having hair scratches on its surface, not always producing perceptible ill effects, but capable on occasion of doing great harm. We have seen a lens with a circular scratch, caused by polishing with a dirty cloth, and many a lens with a deep and decided cut, from similar causes.

We may here add a word of advice about the treatment of such marks. Often they are no detriment to the performance of the instrument, but under a certain conjunction of circumstances they may totally ruin a negative, as, for example, when a very strong light impinges upon the lens from a bright window on one side, when photographing a dimly lighted interior, the scratch may disseminate more light than the view itself. The remedy, therefore, is to paint the scratch with black varnish; the image will not be in any way interfered with, the light will only be reduced a fraction of one per cent., and, in all practical respects, the lens will be equal to new. The importance of this particular branch of our subject has led to our occupying so much space over it that other ramifications of the "dust" question must remain for treatment in a succeeding number.

THE FIXATION OF GELATINE PRINTS.

In writing on the subject of *The Fixation of Prints* in last week's issue, we dealt principally, if not solely, with prints upon albumenised paper; and, though the same general rules prevail in both cases, still prints or negatives on gelatine films present some points which require somewhat different treatment. The comparatively greater thickness, for instance, of the gelatine film renders necessary not only a longer action of the fixing solution in removing the silver salt, but also a correspondingly longer washing to eliminate the soluble production of its action. Then, again, the physical character of the two films is utterly different, the albumen being hard, insoluble, and capable of withstanding a considerable amount of rough usage, owing to its coagulation in the silver bath, while the gelatine is tender and usually soluble in warm solutions, and, even when "alumed," it requires careful treatment to avoid damage.

These physical differences may at first sight perhaps not appear to amount to much, or to be of very great importance; but, in practice, the contrary will certainly be found to be the case, as we shall show. But there is a chemical difference which possibly has far greater effect on the absolute permanency or otherwise of images in albumen and gelatine respectively. *Pure* albumen contains, as one of its constituents, a portion of sulphur, amounting, according to one analysis, to nearly two per cent. of the whole, a considerable proportion, truly, in a chemical sense; but, in ordinary egg albumen, the form in which it is used in the preparation of photographic paper, the proportion is much greater even when fresh, and still further increases as the albumen becomes stale or putrid. As it is the practice of some albumenisers to intentionally keep the albumen until it has arrived at a certain degree of putrefaction, in order to thereby attain a higher gloss on the paper, it will be seen that the chances are greatly in favour of the marketable film being particularly rich in sulphur, or sulphur compounds, long before it comes in contact with the fixing agent.

In the composition of pure gelatine, on the other hand, sulphur is practically absent, or nearly so, though some chemists have indicated small quantities, while others have altogether failed to detect its presence. In the commercial article, it is true that that sulphur may exist in very appreciable proportions, owing to carelessness in manufacture, sulphurous acid being employed in various stages of the process to decolourise the preparation. Still, while this is little likely to occur with the samples now specially prepared for photographic purposes, and used almost universally by the manufacturers of gelatine films and papers, it may be said that the form in which the sulphur presents itself is far less dangerous than in the case of albumen, being rather in the form of sulphite or sulphate than free or in the form of sulphide, as in the albumen film.

Sulphur or sulphur compounds are formed and given off by the decomposition of gelatine, as of albumen or any other organic matter; but this phase of the question, so far as gelatine is concerned, need scarcely trouble the photographer, since the slightest approach to decomposition or putrefaction entirely ruins it for the purposes for which it is employed. Pure, fresh gelatine is an essential to the manufacturers, and no inducement exists, but quite the contrary, to allow it to become in the slightest degree stale.

The effect of this chemical difference amounts just to this, that, whereas albumen paper may contain within itself all the essentials for the formation of dangerous sulphur compounds before, during, and after sensitising, and even after "perfect" fixation and washing, gelatine starts with no such evil character necessarily attached to it, and with careful treatment in the matter of fixing and washing appears to promise a prospect of as complete permanency as can be attained in an image composed of silver. The question, then, is simply what are the best means to be taken to ensure perfect fixation and washing?

In the opening lines of this article we mentioned gelatine negatives, and though these are far less likely to suffer from, at any rate, insufficient fixing than any positives, merely because they are usually treated singly and individually, still all who have had any experience in negative work will know how frequently they do actually suffer from that cause. Take glass negatives, for instance, with which the ocular test of perfect fixation would appear to be all that was required, and go back to the old days of, say, ten years ago, before the introduction of plate-coating machinery, and when films were not so uniform even as nowadays, how often was there found along one edge or on one corner of a plate an unsightly brown stain which gradually developed and intensified itself in course of time, although entirely absent when the negative was freshly made. This was due solely to the imperfect action of the hypo on the thicker portion of the gelatine, where, although all the silver bromide might have been dissolved, *i.e.*, converted into the double hyposulphite of soda and silver, and the film thus rendered transparent, the process had not been carried far enough to produce the perfectly soluble form of the double salt; consequently, no amount of after-washing would remove the evil, or, in much the same way, washing that was sufficient for the thinner parts of the uneven film would still leave sufficient of the soluble double salt in the thick portions to bring about the same kind of discolouration as time went on.

Now, when the difficulty of judging the completeness of the fixation of a film on a transparent medium like glass is so great, how much greater still must it be when the support is opaque paper. The paper prepared by the larger manufacturing firms in long rolls is less liable to suffer from inequality of coating, but that prepared in single sheets is still, it is to be feared, liable to the charge. The ocular test is useless, and as we showed last week the chemical ones are troublesome and inefficient, so what is to be done?

The only general system we can propose is to ascertain what time of immersion is required in a bath of certain strength and at a certain temperature, and in practice to invariably adhere to those conditions, or preferably to give a considerably longer immersion, using always, as a matter of course, a fresh and clean solution of hypo. After that, the question is reduced to one of sufficiency of washing, and this can be attained by the expenditure of a little care. Owing to the greater thickness of the gelatine film, it will be necessarily more protracted than with albumen, but it may be hastened, as may indeed the operation of fixing, by separately "squeegeeing" at intervals each print or negative face downwards on a sheet of glass or ebonite, so as to mechanically force out of the pores of gelatine and paper as much of the solution they contain as possible. On reimmersion in fresh water, the pores will be refilled, and the remaining salts thus far more rapidly diluted and eliminated than is possible by mere soaking.

Another good plan, though involving a little trouble, mentioned to us many years ago by Mr. John Stuart, of Glasgow, consists in giving the print or negative a thorough washing and

then drying. Any salts that remain will now be in the form of crystals and the gelatine in a state to readily and quickly absorb water. The print is therefore reimmersed in fresh water for a short time when, any remaining hyposulphites will be found to have completely disappeared.

ORTHOCHROMATIC PHOTOGRAPHY.

DR. ACWORTH'S paper on this subject, read at the meeting of the Photographic Society of Great Britain on Tuesday last (see page 394), was to some extent devoted to negativing the belief that an ammoniacal solution of a dye was necessary in order to effect the sensitiveness of an emulsion to certain rays. In this he quoted the experience of several able experimentalists, and was supported in his views by some of those who took part in the subsequent discussion.

But there were other points of interest in the paper quite outside this one. Perhaps the principal of these was the statement that, contrary to what might have been supposed, a very minute trace of erythrosine in combination with silver nitrate not only sensitises for the yellow rays, but also causes all the other regions of the less refrangible end to become more sensitive.

The experiments he describes not only bear out this important feature, but also bring to light others of great comparative and particular interest. To three separate emulsions, each of 30 c.c., and containing half a gramme of erythrosine, he added, in one case, nothing; and in the other two half a gramme of silver nitrate and 5 c.c. of ammonia, respectively. The emulsion containing erythrosine alone showed "a small band of yellow sensitiveness;" that containing the erythroside of silver, eight to ten times greater sensitiveness to yellow, as well as increased sensitiveness through the green to the blue. The effect of the ammonia on the third emulsion was practically *nil*.

In the foregoing experiments the silver and the ammonia were added to emulsions already containing erythrosine, but in a fourth experiment the erythroside of silver itself (·010 erythrosine and sufficient nitrate to form the erythroside) was added to the emulsion, and the maximum effect in the yellow obtained. Dr. Acworth concludes from this that large quantities of dye are superfluous, and states that the maximum effect may be obtained by using as little as one or even half a milligramme of, erythrosine to 30 c.c. of emulsion, if the dye be perfectly associated with the silver.

While there has been a tolerably common idea that in orthochromatic emulsion making the quantity of dye necessary was much larger than Dr. Acworth indicates, experimentalists in orthochromatic bathing have been well aware that the quantity required is there exceedingly small. In the course of the discussion, Captain Abney again described his own method of procedure of flooding the plate with the erythrosine solution, and washing out as much as possible of the dye, so that the plate could hardly be distinguished from an ordinary plate. Under this treatment, the quantity of dye which remains in a plate must be infinitesimal.

Several other matters of considerable interest to experimentalists in orthochromatic work and others cropped up in th course of the paper and the discussion, to which we refer them for further details. Dr. Acworth's success in sensitising for all rays of the spectrum by means of tincture of jaborandi and silver nitrate, gives promise, we hope, of further advances in orthochromatic work.

The Convention.—We are authorised to state that the Lord Provost of Edinburgh will officially receive the members of the Photographic Convention of the United Kingdom on July 11. This action on the part of the municipal chief of the modern Athens will, we are confident, be viewed by the members of the Convention with the liveliest satisfaction.

A Large Group.—A photograph of the seventh International Congress of Hygiene and Demography, held in London last August, embracing over 1000 ladies and gentlemen, has been published by Messrs. Barraud. In order to provide sufficient standing room for the representative company figuring in the picture, the proportions of the great staircase of the University of London, which furnishes the background, were enlarged. Each member of the Congress was given a separate sitting, and a satisfactory likeness was forthcoming in each case, and the combination of this large number of portraits is said to have been very successful.

An Automatic Photograph Company Pays a Dividend.—The Automatic Photograph (Foreign and Colonial) Company, Limited, was, we believe, wound up not long ago; but the failure does not, after all, appear to have been a very bad one, inasmuch as we observe that a first and final dividend of twenty shillings in the pound has just been declared, and is payable by the Official Receiver and Liquidator. This means, according to our limited acquaintance with the niceties of company finance, that the shareholders get a return of their capital. Penny-in-the-slot photography, we learn, is still in existence along "the shores that round our coasts from Deal to Ramsgate span."

Recovering Gold and Silver with Aluminium.—Mr. J. R. Clemons, of Philadelphia, whose method of toning with aluminium chloride was referred to in these pages a few weeks ago, suggests the recovery of gold and silver from old gold and silver solutions with the same reagent. The bath is first acidified with hydrochloric acid, and a strip of aluminium placed in it. The gold is said to be precipitated in a good state of purity, and needs only to be slightly washed before being reconverted into the state of trichloride in the usual way. The plan also answers for combined toning and fixing baths, the silver being separated from the precipitate with nitric acid, and the sulphur filtered off from the redissolved gold. Metallic silver is precipitated from the chloride in a similar way.

Ammonia Poisoning.—An inquest was held the other week at Portsmouth on the body of a blacksmith, who had committed suicide by drinking ammonia. According to medical testimony, one teaspoonful of that alkali had been known to destroy life. The coroner asked if it was not unusual to sell poison in such "large quantities," and, on being informed that ammonia was not included in the Sale of Poisons Act, remarked that that was rather strange. There are, besides ammonia, several other chemicals employed in photography of a highly poisonous nature which are not included in the Act, and that are sold in much "larger quantities" than one tablespoonful at a time, but of the poisonous nature of which their users are, as a rule, ignorant. There is, as it were, a fashion in poisons, cyanide being in favour among photographers.

The Kinnear Camera.—We this week publish in our correspondence columns a letter from a gentleman whose name is assured of perpetuation so long as the camera is in existence—we allude to Mr. Kinnear, the inventor of the form of camera which is called after him. Mr. Kinnear, *àpropos* of patentable improvements, sarcastically remarks that "it seems now as if any new screw or slot introduced into a camera was worth patenting." He goes on to wonder what his income would have been now if he had patented the Kinnear camera, which he invented in 1857, and which, with subsequent improvements, is in all essentials the camera now made by hundreds of thousands. Mr. Kinnear is one of the leading architects of the present day in Edinburgh, and architecture is his debtor as well as photography.

A Line to be Drawn.—Mr. Leon Vidal, in the current number of the *Moniteur*, thinks that photographic associations should consist of two distinct groups, the one formed of experimentalists and *savants* devoted to the study of the progress and applications of photography; the other, of amateurs properly so called, whose ambitions do not rise above the sportive use of the hand camera. Between the latter and such men as Janssen, Marey, Lippmann, the Henrys, Lumière, Braun, Balagny, and others, there is, as M. Vidal infers, a tremendous gulf, of which, however, we can supply a perfect parallel on this side of the Channel. Sportive photography, he thinks, should be kept within its own boundaries, and he complains that it is scarcely respectful to scientific and industrial photography for such a beautiful branch of human knowledge to be degraded by certain photo-mural decorations of Paris which he describes. He winds up his remarks on the subject by reiterating the necessity of separately grouping earnest and ephemeral photographers in societies and exhibitions.

World's Congress Auxiliary of Photographers.—The preliminary address of the Committee of the World's Congress Auxiliary on a Congress of Photographers says: "Among the Congresses of the Columbian Exposition of 1893, that devoted to photography should rank high, and be, as it undoubtedly will, a permanent benefit to the civilised nations of the earth. The advancement that has been made in photography, and the processes dependent upon it, within the last twenty years has astonished the artists and scientists of the world. By its aid the astronomer has discovered countless stars and remodelled the map of the starry heavens. It is extensively used in almost every department of art, literature, and science. Its future possibilities are too great for any one to estimate. It is the design of the Committee to have men and women, who have become distinguished in the various departments of the photographic art, and the processes dependent upon it, deliver papers before the photographic congresses which shall contain their best thought, and, after well-regulated discussions, shall become the property of the World's Congress Auxiliary, and, if deemed worthy, be published in the Encyclopædia of proceedings." A lengthy list of subjects to engage the attention of the Congress is then given, and the assistance of photographic societies is asked, as well as suggestions from individuals. A committee is in charge of the arrangements, and "advisory councils" have been appointed both in America and other parts of the world. The Chairman of the Committee is Mr. J. B. Bradwell, of Chicago, U.S.A.

ON THINGS IN GENERAL.

I DO not know whether my readers are most to be congratulated upon escaping, for the first time for twenty years, my monthly visitation, or myself upon being able to resume my pen after an enforced holiday. When, as in my case, one's medical adviser emphatically forbids either reading or writing, inclination must go to the wall. However, I trust my weapon is not rusted by disuse, and that it is as capable as ever of the friendly pricking it is ever intended to give.

Of matters that have been discussed since my last, I have been much interested in the old, old question of amateur *versus* professional. As I need not inform the bulk of the readers of this JOURNAL, an amateur in athletic circles is one who does not compete for a money prize against any one, nor for a prize of any sort against a recognised "professional." He obtains certain advantages by these conditions, and is content to abide by them. But in photography an amateur appears to be one who may make as great an income as he likes by exercising his profession, so long as he has not an office or reception-room devoted to the purpose. Quite recently I heard of a case of an amateur who received 150*l.* for a set of negatives taken in this country, and who yet would deem it an insult to be called a professional photographer. But I do not suppose he ever paid income-tax upon the money. Personally, I do not see, in a free-trade country, why a man should not add to his income in this manner; but I should object to his gaining a medal as an amateur, and still more to his entering the establishment of a professional rival under his false colours, and so gaining information calculated to be of benefit to him in his commercial pursuit of the art. I expect the other day, at the London and Provincial Photographic Association, Mr. Haddon was having a sly laugh at the expense of some of the narrow-minded professionals when he suggested to amateurs their return to wet-plate work as a means of pacifying the former. If the amateur, so called, can make money, let him do so, and forfeit any advantage his amateur status brings him. The good amateurs will, and often do, become good professionals in many cases, and all the better for the profession, which cannot be supposed to exist for the purpose of giving a monopolising status to a lot of indifferent workers, who might be better employed otherwise.

The introduction of the concentric lens promises to mark an epoch in lens production. The controversy which it has raised is only what might be expected, for, when such highly technical questions as the manufacture of lenses is introduced, there is generally some wild talking, the subject being one upon which so very few are competent to give an opinion worth listening to. I have been, I may say, anxiously looking forward to the ultimate publication of the new lens, for, when I had the privilege of being shown in Messrs. Ross's private laboratory, some years ago, the first of the type made, but which they were doubtful about repeating till they had further investigated the keeping qualities of the glass of which it was constructed, I foresaw a great future for the instrument. By the bye, the account given in the *précis* of the proceedings at the Photographic Society of Great Britain is a little indistinct. A "bulb" is there referred to, which to outsiders will appear a mystification; it is simply an achromatic lens in the form of a bulb or sphere which, as explained, is used in examining the image given by a lens. No ground glass is employed as the "bulb" does the same work, but with far greater accuracy. Those, however, who wish to adopt some such means in their own practice can with advantage use one of the pocket achromatic magnifiers now so common. I refer to the kind that appear like a Coddington lens without the diaphragm. If mounted on an adjustable stand, they answer excellently for examining the image given by a photographic lens.

It is unfortunate that the term "depth of focus" has become a subject of discussion, seeing that a true focus lies at a point only, and can have no depth, which, if it be confused with depth of definition, the latter expression lends itself to a vagueness of interpretation far too inexact to found a scientific argument upon.

Another important event on the optical side of photography is the introduction of the tele-photographic lens, which in a limited sphere is capable of considerable use. But it must not be forgotten that, quite apart from any question of difficulty of avoiding vibration, and of getting rid of the effect of haziness through uneven transparency of the atmosphere, there will ever be the effect of haze in the atmosphere to battle against. How many negatives are there in the country at this moment out of the tens of thousands annually produced in which objects half, nay, a quarter of, a mile distant can be compared for clearness and transparency of shadows with those fifty or one hundred yards away? For scientific purposes and as objects of reference, photographs of distant objects may by the aid of the new lens be taken so as to be most valuable, but, as to pictures, scarcely ever. What is "atmosphere" in a picture, but the toning down of the darks by the aid of the haze? it is capable of beautiful effects in pictures where it forms part of a whole, but, when the parts are viewed divested of the surroundings of foreground, &c., they make a poor display.

I have been rather sorry to see the eager way in which, so far as an outsider can judge, a trap has been attempted to be set for Mr. Lyonel Clark in the matter of completion of fixation of prints. Apart from the merits of the case itself, he has conclusively shown that he is in no way responsible for the question set by the examiners.

What an amusing batch of letters the Editor must have when there lies before him the week's queries; but, of all the droll questions asked, surely the drollest is whether, when a piece of glass is cut by a diamond, the cut will fill up and "heal" gradually if left to itself? If the question had been of wax, pitch, or similar liquids, there might be reason for it; but glass!

I see some one has been writing about the removal of silver stains upon negatives by immersing them in a body containing, among other things, twenty per cent. of nitric acid. Might I recommend that, if that be tried and with nonsuccess, the experimenter ascertained

whether boiling them in a pan of water for half an hour would produce any more satisfactory result? I should not think it would be any less dangerous to the integrity of the image.

FREE LANCE.

OBSOLETE PROCESSES.

No. 4.—THE ALBUMEN PROCESS.

THE albumen is the oldest of all glass processes. It cannot altogether be classed as obsolete, inasmuch as it is, in a modified form, still used to some extent for stereoscopic and lantern transparencies. In this form, however, it differs materially from the process by which negatives used to be obtained, and that is the one that will now be described. As in the collodion process, so in the old albumen one, great care had to be bestowed on cleaning the glass, so as to get it chemically clean. The details of this work need not be gone into in this article.

It may be well to explain here that, in the earlier days of this process, there were two methods of iodising the albumen. One was by first coating the glass with plain white of egg, and then submitting the dried film to the vapour of iodine, in the same manner as a Daguerreotype plate was iodised. The other plan, and the one universally followed in the later days, was to dissolve an iodide in the albumen before it was applied to the glass. It is easy to conceive how the former method suggested itself when it is considered that, at that period, the Daguerreotype was the process of the day. Here is a formula that was in very general use, though, as in most of the older processes—and many modern ones too, for that matter—different workers had pet formulas of their own. Albumen from fresh eggs, ten ounces; iodide of ammonium sixty grains; and bromide of ammonium five grains, dissolved in an ounce of water. The mixture was then beaten into a stiff froth, either with a silver or wooden fork, until the vessel containing it could be inverted without any fluid running out. The prepared albumen was then allowed to remain undisturbed in a cool place until the following day. By that time a large proportion of the albumen had subsided, and was then carefully decanted, the almost solid crust of froth on the top acting as a filter as it forced its way through.

For coating the plate it was attached to a holder. This usually consisted of a short wooden rod, at one end of which was a lump, or a cup-shaped piece, of gutta percha. This was warmed in the flame of a spirit lamp, until the outer surface became soft and adhesive. It was then pressed on the back of the glass, to which it adhered. Some of the albumen was then poured on the plate and guided over the surface with a glass rod or a strip of paper. After the albumen had been flowed once over the glass, it was slightly drained off. Then a rotary motion was imparted to the plate by twirling the rod of the holder between the fingers, so that the slight centrifugal force caused an even distribution of the coating. An even film having been thus secured, it was necessary, in order to retain it, to keep the plates in a perfectly horizontal position till they were dry, for albumen, unlike gelatine, has no "setting" properties. For this purpose drying boxes were sold. These were wooden boxes mounted on levelling screws, and having horizontal grooves in them, like an ordinary plate box set on end. In these grooves the plates, immediately they were coated, were placed, alternately with a thin board of porous wood that had previously been made very dry, to absorb the moisture. One of the chief difficulties in connexion with this operation was that of preventing dust from reaching the film, which always seemed to have the greatest affinity for it, any particles of which would show as spots or comets in the finished negative. At that period, it may be mentioned, the most absurd statements were made as to the precautions taken by some workers for its avoidance. The plates, at this stage, if preserved dry, would keep good for years.

The plates were sensitised in an aceto-nitrate bath, similar to that used for wax paper, but stronger, namely, fifty grains of nitrate of silver and a dram of acetic acid to the ounce of distilled water. The sensitising was usually done in a flat dish, and the time of immersion was very brief, from thirty to fifty seconds only being allowed. By use this bath becomes discoloured, like that used for sensitising paper, and it was decolourised in the same way, namely, with kaolin. After the plates were taken from the bath, they were well washed in distilled water to remove all the free silver, and dried. As the film of albumen was very thin, the plate dried quickly. When dry, they had a thin, pale blue opalescent appearance, quite different from the modern dry plate. Albumen plates in the sensitive state possessed excellent keeping properties, both before and after exposure. Indeed, they have been kept for years, and then yielded good pictures.

With regard to the exposure, this was the slowest of all processes on glass. With a single lens, possessing an aperture of *f*-30, in a fairly good light, an exposure to a landscape might be reckoned at from seven to twenty minutes. Great latitude was allowable in this process, perhaps greater than in any other, the gelatine not excepted.

The development was also a slow operation. The time usually was from a quarter to three-quarters of an hour. In the case of great under-exposure, several hours were often required. The developer was a saturated solution of gallic acid, to which a drop or two of the aceto-nitrate bath had been added. In the later days of the process, pyrogallic acid, restrained with acetic acid, was used by some, but gallic acid was originally the universal developer for albumen plates. If the negative was under-exposed, the energy of the developer could be much increased by using it warm, and even hot; or heat might be applied locally, and by that means detail in deep shadows, which would otherwise be lost, could be forced out. We have frequently had recourse to a heated soldering iron, or even a poker, applied to the back of the plate to coax out detail in the heavy shadows when the negative has been much under-exposed. We have even seen the flame of a spirit lamp applied. Sometimes during the development—particularly if it were a long one—marbled stains would make their appearance. These could, however, be cleaned off with a pledget of cotton wool under the tap, and the development continued. The fixing was done with a solution of hyposulphite of soda; two ounces of the salt in a pint of water.

One very general fault with albumenised negatives made by novices was the hard and "chalky" prints they yielded. This was not attributable to the process, but to the manipulations, the negatives being made too dense. The image of an albumen negative developed with gallic acid was generally of a dirty olive-green tint, and of a highly non-actinic character; hence it obstructed far more light than, from its density, it might be judged it would.

That the albumen process was, and is, equal to yielding the finest results, is proved by the early work of such men as Ross and Thompson, of Edinburgh; McPherson, of Rome (very large sizes); Ferrier, and others. Indeed, the albumen process will yet hold its own, except for speed, against any that has hitherto been introduced.

It has been mentioned that this process is an exceedingly slow one—that refers to the normal method of working; but it is on record that one of the most rapid pictures yet taken, including those with gelatine, was that made by the late Fox Talbot, when he, in 1851, at the Royal Institution, took sharply printed matter pasted on a rapidly revolving wheel by the light from the discharge of a Leyden battery.

THE CAMERA AND THE CONVENTION; OR, PICTURESQUE SCOTLAND AND PHOTOGRAPHY.

VII.

AT the last Glasgow Convention, one of the Clyde trips was down to Tarbert and back in the *Columba*. It was most enjoyable, but the distance was so great that most of the places could only be glanced at in passing, with the exception of Tarbert, where we landed and the Convention group was taken. Most of the photography that was done that day was taking shots at each other on board the boat, for we were sailing pretty well all the time from morning till night. Certainly, a few very fine instantaneous effects were secured at some of the quays where we put in. Notable amongst these was Mr. Seaman's picture of the Rothesay Pier; it was a gem, so clear and fully exposed, in spite of the shortness of time and the hundreds of moving figures.

THE GARE LOCH.

On the north side of the Clyde, after passing Bowling and Dumbarton, which we have previously noted, we come to Helensburgh, which is the nearest town to the Gare Loch. The Gare Loch is the first of

these inlets of the river, that stretch away miles between the hills, and are familiarly termed lochs. This inlet runs up north-west about six miles, and its banks all round are well wooded, and rich in pictures. Leaving Helensburgh, and going up the loch, we pass Row Sandon—the village at the head of the loch—and coming down the other side, at the point opposite Row, we come to Roseneath, a very beautiful spot. This would embrace a good day's photography. From this point, a walk across the hill would bring you to Killcreggan. All along these fringes of the sea the prospect is charming, and at any point pleasing effects are to be obtained. There is a pier at Killcreggan, and, further on, one also at Cove, where the next loch enters, between Cove on this, and Blairmore on the other side. This is Loch Long, and Loch Goil strikes out from it some three miles up.

During the summer months, daily tours are arranged for in this vicinity, embracing the finest stretches of river, rock, glen, and mountain passes. One favourite run of this kind is by boat to Loch Goil, where a coach awaits its arrival to convey passengers through "Hells Glen" to St. Catherine's, on the shore of Loch Fyne. Here there is a ferry boat to take passengers across to Inverary, where the *Lord of the Isles* lies waiting to bring the passengers home, by the Kyles of Bute, to Princes Pier, Greenock, or any other calling port more convenient.

Another trip of the same kind is by coach from Dunoon to Loch Eck, thence to Strachur, where a boat waits to take passengers to Inverary.

In this case, also, the journey home is by the *Lord of the Isles*. Leaving in the morning by the *Lord of the Isles* for Inverary, the same ground can be covered the reverse way.

Loch Striven.

We once drove across the hills from Kirn to Loch Striven. We did not find it up to our expectations from a photographic point of view. After leaving the shores of the Clyde, and until we neared the loch at the other end, the hills were barren and bare, and lacking in photographic subject, although, leaving photography out, and looking at them from a picturesque point of view, they were very grand. Hills upon hills, nothing but hills ranging for miles, standing up in all their majesty, without a sound to break the silence, save the bleating of the sheep, that, away in the distance, looked like white pebbles on the surface of the hill.

Away, buried in these hills, we came upon a charming bit in the way of an old dry stone-built, thatch-roofed cottage, of which we made a picture, and at the door we placed the old woman that belonged to it, an old soul that looked as worn and antiquated as the house itself. In conversation she told us that she had been born there, married there, reared her family there, now they were all married and away, and she was still there herself, and not a doctor within call for eight miles. Fancy! and she looked contented and happy.

Rothesay.

Passing Innellan and Toward Point, the Isle of Bute lies before us. Crossing the bay, we reach Rothesay, which is really the most popularised resort on the Clyde, and if esplanades, and bands, and good shops, and a never-ceasing influx of visitors are the sure indications of the well-doing of a place, then Rothesay certainly does well. It lies in the very midst of some of the finest Clyde scenery, and possesses on its own shores places of beauty and interest, combining picturesque drives, lovely walks, and enjoyable sails, all of which commend it as a good centre for the tourist who has a little time to spare. Rothesay, as a town, looks very picturesque from the bay. The ruins of Rothesay Castle are worth the attention of the photographic visitor.

Wagonettes ply daily to Mount Stuart, the seat of the Marquis of Bute. The grounds are open at all times. They are filled with good things, from a photographic point of view, especially the walks and avenues, they are so beautifully wooded. On the way to Mount Stuart you pass Ascog, where Montague Stanley is buried.

Kyles of Bute.

The tram car can now be had from the town to Port Bannatyne, which is the beginning of the Kyles. Opposite Port Bannatyne Loch Striven strikes out from the Kyles, finding its way some eight miles north between the hills.

The Kyles of Bute is that belt of sea that winds round the northern half of Bute, covering a run of some seventeen miles, and it is certainly one of the finest water effects on the Clyde. All the way to Loch Fyne there is a constant shifting of beautiful scenes, twining and turning out and in between between shore peaks and islands, leaving on the imagination of the beholder that surely now he is going to be land locked, and this sensation repeats itself every little bit of the way. With the shores now close in, and now at a distance, with villages, clachans, and cottages springing into view in a most bewildering fashion, and always charming, the steamer goes churning on its way until we reach the open waters at Loch Fyne, after having passed Tighnabruich and other points of interest on the way. Tarbert, on Lock Fyne, is a good place for fishing boats and effects. We have seen many artistic pictures that have been taken there, but one has to wait for them, a short time like that we had at the Convention gives no opportunity for such pictures. Tarbert is much affected by seascape artists.

The next stopping-place is Ardrishaig. If you were staying here any time, some pictures could be got of the Crenan Canal, which is quite near to the landing-stage at Ardrishaig.

Inverary and the Clyde.

Inverary, on Loch Fyne, is also a good centre for a few outings. At this place is the seat of the Duke of Argyle. The town is most romantically situated, and endowed with charming surroundings, and in summer it is also quite interlaced with steamer and coach routes, covering the ground in all directions, one or two only of which we have previously noted.

The islands, such as the big and little Cumbraes, are not so picturesque as many other parts of the Clyde; but Arran is a spot where some time could be profitably spent.

The yachting on the Clyde is one of the features of the place that will commend itself to all lovers of this class of work. A better place than the waters of the Clyde for boat or yacht photography it would be impossible to get. At almost any of the quays on the river good positions for this class of work will be found. Hunter's Quay, however, is probably as good a place as any for a day's work on yachts. The headquarters of the Clyde Yacht Club are there, and a greater gathering of the white-winged sails are often to be found at this spot. Many will remember the day we had *yacht shooting* on board of our own steamer (hired for the day) during the Glasgow Convention time, when, during the bright part of the day, we kept running in and out amongst the graceful racers, with the famous *Thistle* in their midst. That really was a proper method to procure impressions of sailing ships, as the hundreds of plates exposed and the many successful productions proved.

Now, we will have to think of going home, as our plates are done and we have to develop many impressions. Oh, yes, we could take you further afield, and find no end of beautiful districts and places that would delight the heart of the landscape worker. It will be better to leave them for some other time, when the programme now set before us has at least been partially exhausted, and a little opening made for something new. Then we may tell of pastures yet unexplored.

May the Convention gathering have good weather and good times!

PICTORIAL SELECTION IN PHOTOGRAPHY.*

Breadth.

Remember that simplicity of construction, combined with masses of light and shade, agreeably disposed, are the requisites necessary to give a picture dignity and repose. Therefore, although it is most desirable to have variety and contrast in the lines of your composition, it is highly important that these values be carried to no great excess. An outline, well diversified in a natural manner, will always be more pleasing to the eye than a repetition of lines without variety; for the sight is as soon fatigued with monotony and repetition of forms as the ear is with the continued recurrence of the same sounds. The rounded forms of the clouds will contrast with the angular forms of the mountain, and these, in their turn, with the horizontal lines of water; but it is the breaking up of these masses I would particularly wish you to guard against, always bearing in mind it denotes greater talent in those who can "simplify," rather than in those who "cut up" or complicate their productions. For instance, see that your distance is not "broken up" by, say, an open row of trees cutting across it on to the sky line, thus rendering patches of distance as seen between the trees as patches also of the trees themselves (Fig. 5). Get to some other position, in which you can either command the distant prospect without the interruption of the trees, say, above them, or else go closer to them, in order that you may get a view between them, and thus overcome the difficulty (Fig. 6).

Hundreds of otherwise good pictures are quite spoiled through lacking this great quality of "unity" or breadth, whilst those of a very few order excel, in the minds of the vulgar, in its very violation.

Let me give you an example of one of these latter. A little piece of rock here, or a tiny bush there, two stones placed together and another not far off. A winding road which leads to nowhere, cropping up at un-

* Continued from page 376.

expected intervals, serves to offer some foundation for travellers who are seen to keep a most regular and respectful distance from each other. A little to the right is a placid stream of water, with a wonderful lot of rushes of isolated growth and "pot-hook" form. A man in a boat adds life to this portion, whilst a bridge, at no remote distance, affords a vantage ground for one on fishing bent. It would be hard for these poor souls to be far away from any source of refreshment, so a kindly hand

Fig. 5.

erects an inn, and finds a landlord too. You have often seen him. He is most generally to be observed at the door, whilst his wife leans out at the window. Two cows in marching order, single file, one red the other white, go, together with a black horse, to complete the list of all the bodies terrestrial. The prospect beyond is of great variety; heathery

Fig. 6.

moors and glowing fields, rocks of quaint geological formation, and cascades past conception to the ordinary human mind; but at last they are all merged into the distance, and find repose in the "blues."

We have seen, thus far, the most agreeable situation for the "horizon," the position of the point of sight, the tendency of the general lines, the disposition of the masses, and the desirability of maintaining "breadth" to the exclusion of "spottiness" in our pictures. We must now consider the balance of parts, or the relation which one or more masses bear to others in the composition.

Balance of Parts.

A balance of parts does not necessarily mean that equal quantities of the subject should be placed on each side of the picture. We have already noticed this unsatisfactory effect in the view of the roadway as seen from a central position. A great preponderance of your subject may exist on one side, and yet be sufficiently balanced on the other by a group of figures, an object, or a mass of either light or shade. Indeed, it is common, in most landscape compositions, to place a greater mass on one side or the other, allowing it to slope into the distance, the mass being balanced, say, if in a harbour, by "shipping," or, in the case of a roadway, by "animals or figures," the shipping, animals, or figures, *always* holding a secondary position in reference to the amount of space they occupy (Fig. 7).

Fig. 7.

Not only is this arrangement more pleasing in its lines, but it is decidedly more picturesque in the irregularity of its parts. Another very general and agreeable composition is that in which the greatest mass is allowed to take a position a little to either right or left of the centre, sloping towards the sides, the objects which balance it being placed in close proximity (Fig. 8).

Fig. 8.

In the infinite variety of aspect in which nature is presented to us, it is obvious no code of rules could be formulated to adequately suit all circumstances, so that one's own personal judgment must be largely relied upon for selection and arrangement, and, in proportion to the artistic knowledge we possess, so will depend the success or otherwise of our productions.

Strong Lights.

It must be remembered that brilliant light and strength of tone act in a powerful manner on composition. A very small quantity of black and white in violent contrast will require a large amount of middle or half-tone to subdue it and preserve the harmony of the whole.

You will allow me to suggest, when photographing from nature, the necessity of bearing in mind those colours which are likely to give these strong contrasts when reduced to black and white, in order that you may make due allowance for their balance in your composition. I am told it is an excellent plan to use a piece of cobalt blue glass when selecting a subject, as the tones can more readily be estimated by this means rather than on the ground glass.

Chief Point.

Do not forget there should be a *chief point* of interest in every picture which should at once arrest the eye, and in relation to which all other points must be held subordinate. Where this "chief point" should be situated depends very much on the character of the subject chosen, but some points in a landscape are so obviously well suited for this purpose that they should at once be selected and decided upon. In historical or *genre* pictures the chief point of interest is not unfrequently placed in or near the centre, but it is by no means essential it should occupy that position alone.

Having now determined your "chief point," you will arrange the residue of your subject in such a manner as shall keep up the interest of the whole, and present to the eye an agreeable composition. One object should never be placed over another when that other is of equal size or effect, as this, by dividing the interest, would destroy the power of both. For the same reason two objects of the same size and interest should never be placed so as to appear one on either side of a middle object. One must be rendered subservient to the other to overcome this deteriorating effect.

Proportions.

The proportions of pictures may vary with the general forms of the subject selected, but they should never be exactly square. The effect of height is often aided by an upright form, but its height should be evidently more than its width. For landscapes an oblong form is most desirable, varying in length as the prospect demands. W. D. G.

(To be continued.)

ROYAL CORNWALL POLYTECHNIC SOCIETY, FALMOUTH.

The sixtieth annual Exhibition of this Society will open at Falmouth, on Tuesday, August 23, 1892. Medals and prizes are offered in the following departments:—Special Exhibitions of Electrical Appliances, Mechanics, Mineralogy and Chemistry, Fine Arts, Photography, Natural History, "Lander" Competition.

The following are the regulations for intending exhibitors in the photographic section: In all cases it must be stated whether the work is professional or amateur, and the process of production named. All work sent for competition must have been executed within eighteen months of the date of this Exhibition. Carte-de-visite portraits are excluded from exhibition, except when illustrating some special process or novelty. All enlargements for competition must be the work of the exhibitor.

Professional.

Medals are offered for meritorious productions in the following subjects.

Outdoor Photography.—1. Landscape, not less than 20 by 16 inches. 2. Landscape, 12 × 10 inches and under. 3. Genre. 4. Architectural (exterior). 5. Instantaneous, including marine. 6. Animals. 7. Enlargements.

Indoor Photography.—1. Portraits, not less than 20 × 16 inches. 2. Portraits, 15 × 12 inches and under. 3. Home Portraiture. 4. Still life flowers, &c. 5. Interiors, architectural or otherwise. 6. Photo-micrographs. 7. Enlargements.

Amateur.

1. Landscapes. 2. Architectural, exterior or interior. 3. Hand-camera work, not less than twelve examples. 4. Instantaneous, including marine. 5. Still life. 6. Enlargements.

Photographic Apparatus.

With a view to offer facilities to manufacturers to bring their specialities prominently before the public in the West of England, the Society purpose this year to apportion space for photographic apparatus generally, including the lantern and its appliances.

Further information respecting the photographic department may be obtained from Mr. W. Brooks, Laurel Villa, Wray Park, Reigate.

LINCOLN CAMERA CLUB EXHIBITION.

On Wednesday, June 8, the Bishop of Lincoln opened a photographic exhibition at the Schools of Science and Art, Lincoln, which is being held under the auspices of the local Camera Club. The display has been got together by means of special invitations sent out to well-known men, and the exhibits which form the nucleus of the whole have come from the exhibition of English Art Photography recently held in Brussels.

The local press speaks enthusiastically of the pictures shown, most of which are already familiar by reputation to our readers. The idea of bringing examples of the works of all the best known photographers to Lincoln is due to Mr. R. Slingsby, who wrote personally to the Brussels exhibitors, each of whom acceded to the request for work to be forwarded to Lincoln.

At the inaugural proceedings the Bishop of Lincoln was called upon to open the exhibition. The Bishop lightly touched on the history of photography, and gave an interesting and humorous account of his own experiences as an amateur photographer. Proceeding, his Lordship asked the members of the club to see if they could not put into their pictures something of feeling, thought, mind, and soul. It was wonderful what photographs did for them. By their means they could in their own homes look upon the wonderful architecture of Egypt, and upon the scenery of foreign countries. The astronomical and other uses of photography were marvellous. Who could estimate the moral support which a mother's photograph had been to the lad who had gone across the seas to seek his fortune? Many and many a man had in his breast pocket a photograph which had been the star of his life, and had guided him safely over the troubled waters, and through the different temptations which beset him. Let him, if he might, utter one word of caution. He did hope that Society would set its face against and banish indignantly those photographs which a man would be ashamed to look upon if his wife or mother were standing by. He held it to be a disgrace and a wrong upon art for a man to hang upon his walls a photograph the original of which he would be ashamed to be in the company of with his wife or sister.

Our Editorial Table.

The "Fallowfield" Camera.

This is an emanation from the fertile brain of Mr. F. Miall, well known as the inventor of the "Facile" and other cameras. In devising this camera Mr. Miall has introduced a variety of original and ingenious mechanical expedients to secure automatic action. It is arranged for either being used as a hand camera or for being placed upon a stand, and it differs from the "Facile" *inter alia* in this respect, that the subject can be focussed from a distance of three feet to infinity and that the focussing can be done either by a graduated scale or by direct observation on a ground glass the size of the plate. The lens has an iris diaphragm which is opened or closed from the outside, and the shutter is controlled by a brake which enables an exposure of from two seconds to the hundredth of a second to be given, with the option of giving a time exposure when the subject demands it. Another prominent feature is a removable magazine, in virtue of which when the first dozen of plates has been exposed the receptacle containing them may be withdrawn from the camera in full daylight and another magazine inserted in its place.

In these cuts are shown the "Fallowfield" as carried in the hand, the second view given being that of the bottom, which is unseen by the ordinary observer. In this, K is the arrangement for changing the plates, the one selected for exposure being determined by moving the index lever to any special number when plates of different degrees of rapidity are stored; or, of course, they may be exposed in rotation. At the front end the movements of E and H respectively determine the speed of the shutter and the aperture of the iris diaphragm. The other pieces of mechanism are sufficiently obvious not to need special description. Still, we may point out that D, by pressing which the exposure is given, enacts the further useful part of having opened an internal flap which shuts off all light from the plate, the terminal part of the pressure on D liberating the exposing shutter in the lens. By

an automatic arrangement the mere act of withdrawing the magazine of exposed plates closes it up securely against the admission of light, the act of pushing in the succeeding magazine equally and automatically removing its light-tight lid. There are two finders. The camera is neatly covered with crocodile morocco leather. It works with absolute certainty. During the short time it has been in our possession we have exposed and transferred several dozens of plates without experiencing an approximation to a hitch. As will have been inferred from the name it is sold by Mr. Jonathan Fallowfield, 146, Charing Cross-road.

From Messrs. G. & W. Wimpy, 365, Goldhawk-road, W. (the Rembrandt Studio), we have received specimens of their trade work, consisting of charmingly worked-up bromide enlargements, artistically finished in black and white. In one of these the head, a profile, is well relieved by a sketchy floral background, which much conduces to the fine effect. If this young firm continues to issue work of equal merit, many of the profession will avail themselves of their services.

The Strand Magazine for June takes us into the interior of a sculptor's studio, and, aided by numerous illustrations, shows us how a sculptor works, from the framework forming the support of the clay up to the finished model. The portraits of celebrities, at different times of their lives, embrace Sir George Trevelyan, M.P., W. P. Frith, R.A., B. W. Leader, A.R.A., Miss Lily Hanbury, Sir Henry Parkes, and Jacques Blumenthal. Madame Adelina Patti forms the subject of the illustrated interview. The *Magazine* is profusely illustrated.

The 1892 Catalogue of Messrs. E. & T. Underwood, of Granville-street, Birmingham, is rich in particulars and illustrations of the latest and most improved forms of cameras, shutters, tripods, and other apparatus manufactured and introduced by this house. The Catalogue also contains some serviceable hints on the uses of their cameras, lenses, &c., which, being of a high class, enjoy a well-merited popularity among professional and amateur photographers.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 10,277.—"'The Control,' being an Improved Form of Photographic Shutter for Time and Instantaneous Exposures." F. Bartlett.—*Dated May* 30, 1892.

No. 10,349.—"Improved Vignetting Attachment to Photographic Printing Frame." J. Smith.—*Dated May* 31, 1892.

No. 10,363.—"Improvements in Apparatus for taking Instantaneous Photographic Pictures." G. P. C. Maronier.—*Dated May* 31, 1892.

No. 10,502.—"Improvements in or connected with Panoramic or the like Apparatus." Communicated by A. du Bois Reymond. W. P. Thompson.—*Dated June* 3, 1892.

No. 10,503.—"An Improved Spring Fastening for the Shutters of Photographic Dark Slides and other purposes." A. J. Smith.—*Dated June* 3, 1892.

No. 10,611.—"Improvements in Photographic Lenses and in Apparatus connected therewith." A. J. Stuart.—*Dated June* 3, 1892.

No. 10,627.—"An Improvement in Photographic Sensitive Film Holders." S. H. Fry.—*Dated June* 4, 1892.

No. 10,631.—"An Improvement in Photography." H. Van der Weyde.—*Dated June* 4, 1892.

No. 10,748.—"Improvements in Photographic Lenses or Objectives, and in Apparatus connected therewith." Complete specification. A. J. Stuart.—*Dated June* 7, 1892.

No. 10,796.—"Improvements Relating to Photographic Apparatus." H. Mackenstein.—*Dated June* 7, 1892.

No. 10,806.—"Improvements in Apparatus for Trimming Photographic Prints." Complete specification. H. H. Newcomb.—*Dated June* 7, 1892.

No. 10,811.—"Improvements in Receptacles or Cases for Holding and Protecting and Exhibiting in Rotation Photographs, Drawings, or other similar articles." F. A. Walton.—*Dated June* 7, 1892.

No. 10,[illegible].—"Improvements in and relating to Camera Tripods." Complete specification. L. E. Bennett.—*Dated June* 8, 1892.

No. 10,912.—"An Improvement in Photography." H. Van der Weyde.—*Dated June* 9, 1892.

No. 11,971.—"Improvements in Holders for Object Glasses and Lens Tubes." Complete specification. J. Swift.—*Dated June* 10, 1892.

No. 11,013.—"Improvements in Connexion with Photographs and Apparatus for Exhibiting same." Complete specification. J. Dew.—*Dated June* 11, 1892.

PATENTS COMPLETED.

Improved Method of Obtaining Solar Altitudes by the Aid of Instantaneous Photography.

No. 10,101. John Joly, 39, Waterloo-road, Dublin, Ireland.—*May* 14, 1892.

The method consists in photographing instantaneously the sun and horizon so that from measurements made subsequently upon the plate, the angular distance of the sun and the horizon at the moment of taking the photograph can be ascertained. I preferably carry out my invention by affixing to a Hadley's sextant a photographic apparatus, replacing the usual eyepiece or telescope, which, when the moveable limb of the sextant is so set that the sun and horizon are brought into approximate coincidence and the observer, through a suitable sighting glass, points the instrument at the sun or horizon, then, upon releasing a shutter, the photograph taken of the direct and reflected images shows the exact want of coincidence of these, and so affords a correction which, applied to the setting of the sextant, gives the true altitude. To fix the time of observation accurately, I may simultaneously photograph the dial of a timepiece.

Improvements in Apparatus for Changing Sensitised Plates for Photographic Cameras.

No. 11,728. Walter Edmund Kerslake, 47, Garrick-street, and Peter White Johnson, 5, West-road, Elm-park, Ullet-road, Liverpool, Lancashire.—*May* 14, 1892.

This invention has reference to a changing bag and means for attaching the same to the dark slide of a camera so that sensitised plates can be transferred from the bag to the slide, and *vice versâ*, and the object of the invention is to ensure the bag being closed so as to exclude all light from the plate when the latter is in the bag, and also to provide means for attaching the bag to the dark slide, such that the plate can be readily transferred from the one to the other without admitting any light thereto.

We provide a bag sufficiently wide to contain the intended plate, but somewhat longer than the latter; the bag is made of any suitable material which is quite opaque to actinic light; we find waterproof cloth or thin sheet india-rubber suitable for the purpose.

We line the interior of the mouth end of the bag with velvet, plush, or other pile material, the lining extending a little over the edge of the plate when the latter is within the bag, so that there may be no liability of the plate catching the edge of the material as it is being withdrawn.

At a short distance from the mouth of the bag, but between the mouth and the edge of the plate, we attach a strip of metal, or other suitable material, to each of the opposite sides of the bag. These strips are nearly as long as the width of the bag, and placed preferably between the pile material and the outer material of the bag. It will be seen that when a rubber band is stretched round the bag and over the strips, the pile material lining the bag is brought into close contact, and so closes the bag and excludes the light.

In order to more effectually exclude the light, we corrugate the slips longitudinally, that is to say, the corrugations are parallel to the mouth of the bag, and they are so arranged as to interlock; and in order to stiffen the bag, we attach a metallic frame to the bottom and two sides. The section of the frame is preferably U-shaped, the concave side being inwards; this also serves to protect the edges and corners of the bag against wear.

The dark slide, which fits the camera in the usual way, and which has an ordinary sliding door to expose the plate, is provided with a rectangular tube, corrugated transversely, over which the mouth of the bag stretches, and through which the plate is passed into a groove in the slide, the corrugations serving to more effectually exclude the light, and to prevent the bag slipping off.

The mode of using the bag is as follows:—

A sensitised plate is placed in the bag in a dark room, and the bag closed by placing a rubber band over the strips. When it is desired to place the plate in the dark slide, the mouth of the bag is stretched over the corrugated tube, and the rubber band is removed from over the strips and placed round the tube (or two rubber bands may be used); the plate is then transferred from the bag to its position in the dark slide and the exposure made, after which the plate is transferred back to the bag.

The dark slide may, if desired, be fitted with ground glass for focussing, said glass being arranged to move back to admit the plate; the dark slides may also be made single or double, as preferred.

The mouth of the bag may be corrugated so as to form a better joint with the corrugated tube, and metallic springs may be substituted for the rubber bands.

The portion of our invention relating to the corrugating of the bag and tube is also applicable to changing boxes and other devices for changing sensitised plates.

Improvements in Portable Photographic Apparatus adapted to Take Views.

No. 12,374. William Ford Stanley, 13, Railway-approach, London Bridge, S.E.—*May* 21, 1892.

The object of my invention is to construct a camera, with its stand or tripod, for taking large views, in so portable a manner that the whole apparatus may be easily carried by one man, also to make the camera in a special light manner, with arrangements for enclosing or boxing-up the whole of the parts liable to damage, so that when closed the outer parts of the camera form a box or suitable case to contain the camera, focussing screen, and a number of double dark slides. The stand is constructed so that it packs in a small space, with a form of slide specially adapted to this camera that will not jamb or stick in its parts if wetted or exposed to damp. And an arrangement for holding the camera steady when upon the stand.

To carry my invention into effect, I construct my apparatus as follows:—

The camera, a convenient size of which is for carrying plates 15 × 12, but it can be adapted to any size, is formed within a case, just large enough in width

and depth to carry the dark slides, and the thickness through is governed by the number of dark slides to be carried. Three is a convenient number, holding six plates. These, with the focussing screen, are placed against the back of the case, and just in front of them a suitable frame which the dark slides or focussing screen bear against, and the bellows body of the camera is attached. This frames comes about the centre of the case, and is fitted with a spring piece at its upper part to bear against the dark slides and prevent any possibility of light entering. The front portion of the case contains the folded bellows body and wood front for carrying the lens; the bellows is tapered so as to fold more compact, and is of oblong form, so that the lens front may be fitted with a peep-hole or lens for focussing from the front. This peep-hole is fitted with a suitable light-tight shutter. The front of the case is hinged so as to open down and form the baseboard of the camera, it being held in its position by suitable metal ties which clamp by set screws running in slides upon the sides of the case. The inside of this flap is provided with slides, in which the lens front of the bellows body moves, fitted with suitable means for clamping the lens front to focus in any desired position.

The top of the case is hinged at the back part so as to open for changing and operating the dark slides. The dark slides are made as light as possible, and provided preferably with vulcanite shutters. The focussing screen is preferably formed by stretching a sheet of drawing paper on a suitable frame. Space is left at the back of the case behind the dark slides to contain the shutter of a dark slide when it is removed for taking a photograph. Suitable arrangements are made in the bottom and one side of the case for attaching to the stand for either portrait or landscape views, and locks, catches, and other fastenings are provided for keeping the hinged flaps closed to box up the instrument when out of use.

The stand is made of a usual sliding form, with either one, two, or three slides, and as light as possible consistent with strength, but with the following essential difference, that, as hitherto all sliding camera-stands have been made to slide by means of square grooves on each side of one piece and square projections upon the other, so that if the wood gets swollen at all by wet or damp the slides jamb or stick, thus causing a considerable amount of inconvenience to the user, with this improved stand, instead of making square grooves and square pieces to slide in them, I make the grooves and sliding-pieces V shape, and provide a suitable clamping arrangement round the legs, so that by slackening back the clamping screws the sides are perfectly free to run easily, and, when in any desired position, they are clamped with greater rigidity by means of the clamping arrangement. The clamps are preferably made by bands of metal encircling the lower part of each section, provided with a suitable screw arrangement at one side, by which the legs are clamped together. By this arrangement it will be seen that the slightest turn of the clamping screws will cause the slides to fit quite tight, or, by release, be perfectly free, no matter whether the wood is swollen by wet or not.

The steadying arrangement is made as follows. In any suitable position upon the camera, preferably on the large flap that opens down, forming the base, a stud is affixed, and round this stud a cord passes to two suitable spikes, preferably fitted with handles, by which they are pressed into the ground, and the cord is provided with an arrangement for adjustment, preferably similar, but on a small scale, to that used for tent ropes; the cord runs through eyes in the handles of the spikes, so that no other fastening is necessary, and is tightened up by the above described means, thus forming a stay in two ways from the camera to the ground, to prevent the effect of wind upon the camera.

The whole of the camera and fittings is provided with a suitable waterproof canvas case, which is constructed to be carried knapsack fashion upon the back of a person, the said case being also fitted with a suitable handle for carrying by hand if desired.

Various modifications may be made, and any suitable materials used.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
June 20	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 20	Hastings and St. Leonards	
,, 20	Leeds (Technical)	Mechanics' Institute, Leeds.
,, 20	South London	Hanover Hall, Hanover-park, S.E.
,, 21	North London	Wellington Hall, Islington, N.
,, 21	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 21	Southport	Shaftesbury-buildings, Eastbank-st.
,, 22	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 23	Birmingham	Lecture Room, Midland Institute.
,, 23	Hackney	Morley Hall, Triangle, Hackney.
,, 23	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 23	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 23	Oldham	The Lyceum, Union-street, Oldham.
,, 24	Cardiff	
,, 24	Holborn	
,, 24	Maidstone	"The Palace," Maidstone.
,, 24	Richmond	Greyhound Hotel, Richmond.
,, 24	Swansea	Tenby Hotel, Swansea.
,, 24	West London	Chiswick School of Art, Chiswick.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

JUNE 14th.—Ordinary Meeting.—The President (Captain W. de W. Abney, C.B., F.R.S.) in the chair.

Mr. H. A. Lawrance was elected a member, and six other gentlemen were nominated for membership.

It was announced that the Madras, Putney, and Saltburn-by-the-Sea Photographic Societies, and the Cleveland Camera Club had been admitted to affiliation of the Society.

ORTHOCHROMATIC PHOTOGRAPHY.

Dr. J. J. ACWORTH, Ph.D., F.I.C., F.C.S., read a paper on *Orthochromatic Photography*, in which, after saying that he proposed to confine himself to a few scientific facts, and digressions therefrom, he described the uses of the spectroscope in observing and photographing absorption bands of various dyes, dyed emulsions, &c. One class or series of dyes was more particularly used for orthochromatising than any other—the so-called eosine series. For yellow sensitising one dye had hitherto been preferred, as it gave less slowing action in the blue, and that a tetra-iodo, fluoresceine, or erythrosine; for green, uranine, or the soda salt of fluoresceine now commercially used; for orange, red quinoline blue or cyanine is employed. Dr. Vogel's secret "azaline," for red sensitising, was composed of quinoline red, with a smaller proportion of quinoline blue (cyanine).

He had no doubt that, although one or two of the so-called eosine group of dyes were now mostly used in orthochromatic photography, other dyes were equally or even more suitable. Even now they had the rhodamin series of dyes quite outside the cosine group; but he was somewhat doubtful if, after all, dyeing a plate was anything like a perfect method of making it more sensitive to the less refrangible rays of the spectrum. Captain Abney had shown how bromide of silver can be made sensitive to the red and even ultra-red rays, and this without any addition of dye. Certain brands of plates possess far greater yellow sensitiveness than others did, they but work with the idea of making undyed bromide of silver yellow sensitive instead of blue sensitive. A solution of erythrosine added to a gelatino-bromide emulsion instantly made it sensitive to the yellow rays. By adding ammonia the sensitiveness to the yellow rays was no more increased than was its sensitiveness to the other parts of the spectrum. Adding some erythrosine—in fact, a very minute trace—to some more of the same emulsion, and then some silver nitrate, they got a combination between the silver and the dyed emulsion, and this caused the emulsion to become far more sensitive to the yellow rays, and, in fact, far more sensitive to all the other spectral regions of the less refrangible end.

In connexion with orthochromatic photography he mentioned the names of three workers—Dr. Eder, Dr. Vogel of Berlin, and Mr. Clayton, an orthochromatic plate-maker of Paris. The latter two had one thing in common—they were patentees of orthochromatic methods. The Tailfer and Clayton patent, January, 1883, claimed the use of ammonia in conjunction with the dye because "eosine gives no result unless it is introduced with ammonia as a vehicle." This was an assertion absurd and contrary to fact, as mentioned by Mr. Bedford a year ago. It was the combined use of ammonia with eosine that formed the essential feature of the patent. It says to every 100 grammes of emulsion you must add one gramme of dye. This is what he did to a certain extent. This dyed emulsion possesses a greatly reduced sensitiveness to the blue rays, about one-third or a quarter of the original, whilst the yellow sensitiveness is very high, and equally so whether ammonia be present or not. Of course, they were aware that plates are not, nor could be, prepared in such a manner, the enormous quantity of the dye alone greatly interfering with the practical working of the plate. Another point worthy of notice was, that as most of the gelatino-bromide plates were prepared by means of ammonia, this patent, if it could be maintained, would have the consequence, when cosine dyes were present, of preventing the preparation of plates by the usual method of making emulsion, which to his mind seemed extraordinary, to say the least.

Professor Vogel's patent appeared to his mind as the only real patent of any commercial or practical value that has ever been taken out for the manufacture of orthochromatic plates. Its essential feature or claim is the combination of the dye with silver, or formation of eoside of silver. All orthochromatic plates to-day were, he believed, made under this patent. In the case of Vogel's patent we can use, instead of a large amount of dye, merely a few milligrames, these few milligrammes giving an effect infinitely so superior to that obtained with the larger amount of dye that we can no longer compare them. They had heard a good deal of discussion about optical and chemical sensitising. He thought it was becoming recognised that Tailfer's method should be described as optical sensitising, and Vogel's chemical sensitising, the latter giving far superior results to the former. This patent had already lapsed for nearly a year. To prove that orthochromatic plates are made according to Vogel's eoside of silver process, they had only to treat a plate with a solution of potassium bromide, which would to all intents and purposes deorthochromatise it. The practical orthochromatisation of a whole plate may be destroyed by a single milligramme of potassium bromide. Potassium bromide is usually added to emulsions to cause them to keep, so you can understand the reason why orthochromatic plates are supposed to deteriorate so much more quickly than ordinary plates.

The following results of experiments bore on optical and chemical sensitising.

Nos. I., II., and III. were separate emulsions, each containing 30 c.c. of ripened emulsion and ·05 gramme erythrosine.

To I. added nothing; to II. added ·05 gramme $AgNO_3$; to III. added ·5 c.c. AmHO. Tested wet in the spectroscope.

No. I. showed a small band of yellow sensitiveness.

No. II. showed a vastly increased sensitiveness to yellow (eight to ten times greater), and the band of sensitiveness now stretches without a break, though of course, of reduced intensity, through the green right away to the blue violet.

No. III. General sensitiveness to the whole spectrum was increased, but sensitiveness to the less refrangible end did not appear any more increased than does sensitiveness to the more refrangible end

No. IV. To 30 c.c. of emulsion ·010 gramme of erythrosine and $AgNO_3$ sufficient to form erythroside of silver was added. In this case the maximum effect in the yellow was attained, and practically little, if any, loss of blue-violet sensitiveness. From this it was obvious that large quantities of the dye were superfluous and injurious. The maximum effect could be obtained by using far less than even this latter amount, for he found that 1 mgr. or even ·5 mgr. of erythrosine to 30 c.c. of bromide emulsion would, if the dye be perfectly associated with silver, still give a maximum effect in the yellow.

He had also tried the combination of uranine and erythrosine, and with satisfactory results, as the following experiment showed:—

To 30 c.c. of emulsion he added ·030 gramme uranine and ·05 gramme of $Ag\,NO_3$. This gave a splendid band in the green. A small quantity of erythrosine—say 1 mgr.—did not seem to give a good result in the yellow; but

when the amount was increased to 5-10 mgr., yellow sensitiveness was obtained. He further made a uranin-erythrosine emulsion, containing ·030 gramme of uranin and .015 erythrosine, the emulsion containing silver equal to 5 grammes of nitrate and sufficient free silver to combine with the dye. To a portion of such emulsion potassium bromide was added.

The normal uranin-erythrosine dyed emulsion gave a curve of sensitiveness similar to No. I. That to which a small portion of bromide was added, a curve similar to No. II. It will here be seen that yellow-green sensitiveness has been vastly depreciated in comparison with that of blue sensitiveness—in fact, the emulsion was practically deorthochromatised. A plate coated with the normal emulsion, and treated subsequently with potassium bromide, produced a similar degradation of yellow-green sensitiveness.

M. Léon Vidal said in France very few plates were sold made by the Tailfer-Clayton process, which was worked solely by the patentee, these plates being of a quality much inferior to those made by the famous firm of Lumière, of Lyons. The plates of this latter firm, which were so much esteemed in France, were made in a manner quite different from that of Tailfer-Clayton, and were prepared in two series, the one sensitive to the yellow-green rays and the other sensitive to the red. Through the courtesy of Messrs. Lumière, he had received some of these plates for testing. When examined spectroscopically, the yellow sensitive plates show a band of sensitiveness similar to that when erythrosine is used. Those sensitive to red show a band of sensitising action in the red. Both are remarkably fine and clean working plates. M. Jissandier, at Paris, also makes orthochromatic films by another process. The well-known firm of Dr. Monckhoven, of Ghent, also makes orthochromatic plates by a process which he has himself elaborated. M. Vidal says that the so-called patent has hindered any advance of orthochromatic photography in France, until a few high-class firms, possessing both intelligence and enterprise, have neglected the patent, and worked out something better without it.

For scientific purposes he had made plates sensitive, practically, to all the rays of the spectrum. For this purpose he used tincture of jaborandi, and used the tincture in combination with silver nitrate and ammonia in the emulsion. Of course, chlorophyll was the chief colour sensitiser here. The results were, however, somewhat uncertain, and the plates kept badly. With these plates, however, he photographed the solar spectrum, and obtained the photograph of the lines from A in the red right away to H, and beyond the violet on the same plane.

Concluding, he touched upon orthochromatic collodion work in Germany, which he thought disappointing compared with gelatino-bromide work, and spoke of the use of the coloured screen, the necessity for which depended on the relative sensitiveness of the plate to the blue and yellow, on the predominant colours of the subject, and on the quality of the light. At the termination of the paper, he showed examples of natural colour photography by Dr. Vogel produced by using plates sensitised for the different colours, the colours of the collotype print being determined by those of the subject. Dr. Vogel said there was no patent in Germany for orthochromatic photography, which was an imitation of Waterhouse's work, and therefore there was no invention in it.

The PRESIDENT said that, in the discussion, he must ask them to avoid legal questions. He should rule questions as to patent rights out of order. They must confine themselves to the scientific and artistic sides of the subject, as they had quite sufficient to discuss without making themselves a small court of law.

Dr. G. LINDSAY JOHNSON asked for information as to how long orthochromatised plates would keep, compared with non-orthochromatised plates; also, was any special formula better than others?

Mr. J. SPILLER said that although the subject was not new, he felt great interest in it. Dr. Acworth had done wisely and well in bringing it before the members of that Society in a true, scientific spirit. There were one or two details in the paper as to which he was inclined to join issue with Dr. Acworth. First as to optical and chemical sensitisers. Were they really not one and the same thing? Dr. Acworth had mentioned that, by the application of a small quantity of dye, adding at the same time a certain proportion of silver nitrate, the emulsion could be orthochromatised with a much smaller amount of colouring matter. At first sight this was a very important step in the direction of progress; but would Dr. Acworth assert that plates prepared this way had any permanent qualities? Was it possible that plates with free silver nitrate would keep? Then, when erythrosine came into contact with bromide of silver, a chemical change occurred by the interchange of bromine and iodine, which was often lost sight of. The familiar reaction, Ag Cl + KI = Ag I + K Cl showed, substituting erythrosine or fluorescein, that a change occurred. Iodide would be formed in the film, and erythrosine was no longer in the mixture as a colouring matter; the iodine had gone to the silver. They used erythrosine as a simple dye, in order to tint the film, but whether it was used in that form, or first combined with silver, as Vogel would recommend, it came to the same thing in the end. There was a sharp line between optical and chemical sensitisers, because, in the latter, decomposition occurred which would eventually bring about a change.

Mr. W. E. DEBENHAM said that Dr. Acworth had told them that a small quantity of bromide of potassium was sufficient to deorthochromatise a plate, but were the emulsions other than orthochromatic emulsions, not made with erythrosine to start with, not made with the usual excess of bromide? Otherwise, they would be deorthochromatised at once. With regard to Mr. Spiller's equations, did the iodine go over to form iodide of silver associated with some complex body or a simple potassium body? His own experiments fully confirmed Dr. Acworth's statement that ammonia was not in the slightest degree necessary for making orthochromatic emulsion plates, or for sensitising plates already prepared. He had sensitised ordinary commercial plates with erythrosine, and found that the resulting plates were as nearly as possible identical with commercial plates. Several had repeated the same experiment and the same statement. It was surprising to find the assertion depended upon in any way that erythrosine without ammonia is useless in an emulsion, or does not produce its full effect. As to the effect in collodion, he found it much the same as with gelatine plates. The plates which showed the best effects without a screen were those prepared with collodion. Erythrosine plates prepared in the ordinary way, without a screen show very slight effect. He did not know whether Dr. Acworth had gone into the amount of slowing which a screen produced on an erythrosine plate. He (Mr. Debenham) had found that a yellow screen, which slowed an ordinary plate four times, only slowed an erythrosine plate about twice.

Mr. J. R. GOTZ said that he had had Dr. Vogel's azaline in his hands for the last six years at least. With respect to another matter that had been mentioned, as to Dr. Vogel being one of the first to make experiments with orthochromatising bromide of silver plates, he thought that their President made the same experiment as Dr. Vogel at the same time.

Dr. J. J. ACWORTH, in the course of his reply, said that, so far as his experience went, orthochromatic plates did not keep so well as ordinary plates, for the reason that soluble bromide was added to an ordinary emulsion to make the plates keep. With regard to a large amount of dye as against an extremely minute amount, Dr. Vogel said that he liked to use the large quantity, but he (Dr. Acworth) preferred the small quantity. It was the large amount of dye mentioned in the Tailfer patent he was speaking of, which was absurd for all practical purposes. As to Mr. Spiller's remarks regarding the free nitrate, there should not be excess of silver. He doubted whether iodine was dissociated from the body itself, as suggested by Mr. Spiller, but he (Dr. Acworth) could not say. Orthochromatic plates could not be made with excess of bromide. The limits of adding erythrosine were very wide; a large amount of dye degraded blue sensitiveness, but did not affect the yellow to any appreciable degree. Employed as an optical sensitiser, a large amount of dye must be added to get any result at all. The finer results given by collodion were due to the collodion having free silver.

Dr. LINDSAY JOHNSON said there were two points as to the qualities of orthochromatic plates to which he would like to refer. Many people had the idea that the plates in the market lost orthochromatic qualities, but remained the same as ordinary plates. He would like to know whether a good orthochromatic plate in keeping would retain its photographic quality, without its orthochromatic quality, or whether one goes or both. He had got plates from a well-known firm in London, and kept them for a year and a half, and found they were quite as good as when they went out.

Dr. ACWORTH, in reply, said that he did not think it hardly possible that the orthochromatic effect could be lost, or not unless the plate went wrong entirely. He had found some plates kept very well, and others badly. It hinged upon one or two details of the *modus operandi*.

The PRESIDENT, in closing the discussion and moving a vote of thanks to Dr. Acworth, which was carried, said that, regarding the large quantity of emulsion orthochromatised by a minute quantity of colouring matter, his own practice was to pour it on the plate as collodion, and wash out as much as ever he could, so that he could not distinguish the plate from an ordinary plate. He had described the method at the Camera Club some time ago. Using cyanine after erythrosine, he worked the same way, washing between each. Mr. Debenham made a remark which recalled an experiment of his (the President's) made many years ago. When Dr. Vogel first gave them the benefit of his experiments, he said that he (the President) could not get an orthochromatic plate with an excess of bromide, but he got it, and the Doctor said he didn't. An emulsion with excess of bromide could be orthochromatised. The most perfect dye was the combination between erythrosine and cyanine. Used separately they could get the whole of the spectrum from beginning to end. Eikonogen development gave good results. As to optical and chemical sensitisers, Dr. Acworth had taken quite the reverse view of Dr. Vogel, who conveyed quite a different meaning. Dr. Vogel said that an optical sensitiser was where the dye itself was optically sensitive. There was a crucial experiment which told whether the interchange Mr. Spiller referred to took place. Pure erythrosine was fluorescent, and if the combination occurred, they got eosine, which was not fluorescent. He presumed that double decomposition took place, because that interchange was obtained. M. Vidal had thought orthochromatic plates the most suitable for stellar photography, and he (the President) agreed with him, but their telescopes were not corrected. They should use a reflector instead of a telescope, and they would get better results.

PHOTO-TECHNICAL EDUCATION "AT HOME AND ABROAD."

Mr. E. H. FARMER read a paper on this subject, beginning by saying that in November last Mr. Warnerke, a member of the Council of the Society, read a paper entitled *Photo-Technical Education on the Continent of Europe*, and therein said:—"First of all, he would *give the reason why the Council* had asked him to read such a paper: *We had no establishment in this country which gave instruction in photo-technical education.*"—*Vide* THE BRITISH JOURNAL OF PHOTOGRAPHY, November 12, 1891. Mr. Farmer said this statement and its equivalent, by word, and a great deal more by inference, had gone forth to the public press by the authority of the Council; an authority which, as the representative of the Photographic Society of Great Britain, is, in name at least, the highest authority on photographic matters in England. He wished to say that, however much it might concern him personally as a public teacher of photo-technology, he wished to sink his own identity and to appear before them as the official mouthpiece of the Polytechnic. The force of this derogatory statement could only be fully appreciated by taking into consideration the circumstances which led to its being made. The Council decided that a photographic institute, one of whose chief functions would be photo-technical education, should be promoted in London under the management of this Society. As a worker in the cause of British photography, he was glad to welcome the prospect of the new photographic institute. But while the Council commissioned their agent to tour the Continent of Europe and survey the photographic schools, large and small, which are there to be found in conjunction with polytechnics and technical schools, they not only neglected to recognise the schools already existing in England in connexion with similar establishments, but, on the contrary, allowed their representative to state, and the public to infer, that there were none. It was not his intention to discuss the scheme of the proposed Institute, although, at all times, he would feel the utmost desire to do all he could to promote so excellent an object; but it was his duty to lay before them a brief *résumé* of the facts he had been able to compile in comparing the Continental schools with the work of the Polytechnic. In making this comparison, he did not wish to disparage in any way those institutions on the Continent. The salient points of comparison in the

various schools were these :—I. The buildings, appliances, and endowment funds. II. The fees paid by students. III. The code of instruction. IV. The number of students. V. The results of the teaching.

Mr. Farmer then gave a history and description of the Polytechnic School of Photography, comparing it with the Continental schools, and concluded: "I have said enough, I hope, to show that *we have* establishments in England where photographic technical instruction can be obtained, and I believe that any unbiassed inquiry into both will prove that whether 'the number of the students,' the degree of advancement to which the instruction is carried, 'or the results of the instruction,' be taken in comparison, the work of our school at the Polytechnic will compare most favourably with that done in any school on the Continent. In view of the facts I have laid before you, I trust your Council will see the advisability of publicly removing, in no half-hearted or niggardly manner, the stigma they so unwarrantably cast upon English photographic education, and on our school in particular; and as I understand that this is the last meeting of the Society this session, I would point out that anything they intend doing must be done at once."

Mr. W. S. BIRD regretted Mr. Warnerke's statement did not cover the whole of the ground. The Polytechnic School could have brought it to the notice of the Council. The statement did not appear in their own journal. He was sure there was no intention to do any harm.

Mr. W. BEDFORD said there was one thing to be borne in mind as to the unfortunate remark which Mr. Warnerke was reported to have made, and that was, Mr. Warnerke had no mission to go abroad; he was simply asked to read a paper. The sentence did not appear in their own journal, so that, perhaps, on second thoughts, he saw the remark was not justified.

Mr. DEBENHAM thought Mr. Farmer had misconceived the position. Mr. Warnerke did not represent the Council; things might be represented in the paper over which they had no control.

Mr. T. SEBASTIAN DAVIS believed that on the occasion in question Mr. Warnerke's point was that there was no society or institution supported by Government in which the subject of photography was taught, and he thought that was the general impression. He was sure they were all pleased to hear Mr. Farmer's excellent description of the Polytechnic Institution, which was conducted without Government aid.

Mr. CLIFT believed Mr. Warnerke had the subject of photo-mechanical printing in his mind. There was no school whatever in this country, and the proper workers could not be had in England.

Mr. T. R. DALLMEYER thought most of them understood Mr. Warnerke to have that meaning. M. Léon Vidal had recently assured him (Mr. Dallmeyer) that we were behind France and Germany in respect of photo-mechanical work.

Mr. ANDREW PRINGLE agreed with the views of the preceding speakers, and said he thought the business of the Polytechnic Institution was with Mr. Warnerke personally rather than with the Society. There was no such statement as Mr. Farmer complained of in their official transactions. It had only been reported in THE BRITISH JOURNAL OF PHOTOGRAPHY. Mr. Farmer had misunderstood Mr. Warnerke, and should have applied to Mr. Warnerke for assistance.

After some further discussion, Mr. FARMER replied.

The PRESIDENT, in closing the discussion, said the Society was sorry if, by any means, it had given countenance to the idea that it had slighted the Polytechnic. Nobody knew more than he did regarding the amount of instruction given there, and he had reason to believe that every word Mr. Farmer said was absolutely correct. He had been Examiner of the City and Guilds Institute for some time, and he was perfectly ignorant where the papers came from, but he found that the Polytechnic was generally to the fore. Photo-mechanical process work was a fixed idea in Mr. Warnerke's brain, and he (the President) was perfectly certain that when Mr. Warnerke was making his introductory remarks, he was thinking of instruction in photo-mechanical printing. He (the President) might have taken objection to the remarks, as there was a photo-mechanical printing establishment at Chatham, of which he (the President) was the founder; but it never struck him as having any bearing on the case. He asked them to show, by their applause, that there was not the slightest intention in any way, on Mr. Warnerke's part, in his introductory remarks, to slight the Polytechnic, and that they regretted it for him and for themselves.

Mr. Farmer having been duly applauded, the meeting terminated.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 9,—Mr. T. E. Freshwater, F.R.M.S., in the chair.

Mr. A. E. Smith, of 90, Queen-street, Cheapside, was elected a member.

PROGRESS OF THE AFFILIATION SCHEME.

The HON. SECRETARY read a communication from the Photographic Society of Great Britain, stating that proofs of the papers read before the Society would be available for the affiliated societies, before whom, also, Mr. W. E. Debenham was willing to lecture. Members of affiliated societies would at the forthcoming exhibition be entitled to a remission of half the charges for wall space and on the tickets of admission. The following societies had placed their dark rooms at the disposal of members of affiliated societies :—Southsea, Oxford, Hull, Leeds, Liverpool, Darlington, Dorset, North Kent, and the Photographic Society of Great Britain.

EGGS AND SENSITIVENESS.

Mr. W. H. HARRISON quoted a statement of Hunt, that in albumenising paper more sensitive results were got with the albumen from ducks' eggs than from hens', and still more from that of the eggs of geese. The albumen of the eggs of birds of prey was said to increase sensitiveness. Was there any truth in the statement?

Mr. W. E. DEBENHAM said they were so accustomed to hear these statements as to greater sensitiveness, that he thought they might disregard the whole lot. He thought there was little difference in the sensitiveness of any albumenised or gelatine papers.

COLOURED FOG.

Mr. J. E. Smith exhibited a negative developed with hydroquinone followed by pyro-ammonia, in which green, red, and yellow fog were visible.

Mr. A. COWAN said the coloured fog was produced by the combination of hydroquinone with ammonia.

Mr. W. E. DEBENHAM observed that the complementary colours of the fog were visible by transmitted light.

THE YELLOW SCREEN.

Mr. P. Everett exhibited two negatives of the same subject, one exposed with, and the other without a screen, on Ilford medium plates. The exposure with the screen was increased three times. He had tested the screen with albumenised paper, printing to the same tint with and without the yellow screen. The screened negative was in all respects superior.

Mr. DEBENHAM had found that with a pale yellow glass and an ordinary plate he had to give four times; but with an erythrosine plate only twice the exposure. Deep yellow increased the exposure with an ordinary plate twenty, and with an erythrosine plate five times. He had used Edwards', Ilford, and plates of his own preparation. He thought Mr. Everett wrong in his ratios.

Mr. J. S. TEAPE asked if Mr. Everett had been guided in the development by the screened negative, as it seemed to him that the unscreened picture was not developed enough?

Mr. EVERETT replied that development of both pictures was simultaneous, and pointed out that halation was about equal in each case.

The date of the annual general meeting was altered from June 23rd to the 30th.

North London Photographic Society.—June 7, Mr. J. Traill Taylor (President) in the chair.—The members of this Society (and a goodly number of visitors) met on the above evening to hear a discourse by Mr. Redmond Barrett on *Retouching*. Dealing with the ethics of the art, both from an artistic and a commercial point of view, Mr. Barrett pointed out the purpose of retouching, and described very clearly what should be done and what left undone, interspersing his remarks by several amusing anecdotes of personal experiences, and illustrating them by a considerable number of specimens of different classes of work. Mr. Barrett, as was to be expected, dealt with his subject in a thoroughly practical manner throughout, and was highly successful in establishing his possession of a perfect command of all the niceties of his art, as well as in conveying a mass of valuable, instructive hints thereon to his audience. In conclusion, he promised to give the Society another evening later in the season, for the purpose of actual demonstration upon a number of negatives to be provided for the purpose. A conversation followed, and a cordial vote of thanks to Mr. Barrett concluded the meeting. Next meeting, June 21, Mr. J. Traill Taylor on *Photographic Lenses*. Ancient and modern visitors are cordially invited.

North Middlesex Photographic Society.—June 13, Mr. Stanley Barnard in the chair. Two new members were elected, and one nominated for election. Mr. F. E. JONES gave a demonstration on the Platinotype Company's new cold-bath process. He developed prints from hard and soft negatives, and having purposely obtained air bubbles on the surface of a print, showed that they disappeared before completion of development. The points he emphasised were :—That the new process is suitable for use with softer negatives than the hot-bath process, and if a negative gave hard prints, it would be advantageous to over-print and develop on a weak bath. No thermometer or special dish is necessary. In printing it would usually be found desirable to print until detail is visible in all but the highest lights. Paper which had been properly stored for some time would give more half-tone than newly coated paper. The developer is made by dissolving half a pound of developing salts in forty-eight ounces of water. About fifteen seconds' floating is necessary, or longer if there are heavy blacks in the print, or the shadows may be rusty and granular. The used developer should not be kept in a strong light. Mr. Jones answered a number of questions, and stated that an under-exposed print might, in some cases, be saved by slightly heating the developer. A vote of thanks was accorded to the lecturer. Messrs. HOUGHTON & SONS exhibited their hand camera, explaining the action of all the parts. The remainder of the evening was devoted to technical matters arising from questions found in the box. The usual competitions of views taken at recent field-days were held, that for Sewardstone showing the largest number of entries. The vote of merit was won by Mr. H. Smith. The next meeting will be held on June 27, when Mr. F. Tennant will take the chair, and celluloid films will be the subject of discussion. Visitors will be welcome.

Holborn Camera Club.—June 10, Mr. A. Horsley Hinton (President) in the chair.—Mr. E. CLIFTON gave a lecture on *Developing in Practice*, dealing only with development by pyro. He dealt first with the dark room. The most important thing was the light, and daylight should be dispensed with, having oil or gas as the source of light. The next most important point was cleanliness. Many of the mysterious marks and streaks on the plates were due to a dirty and sloppy bench. With regard to developing, Mr. CLIFTON said the preliminary soaking of the plate in water before developing was no great advantage, and gave rise to air bubbles. The best developer for amateurs who had to develop plates exposed on various subjects was pyro-ammonia, using the various ingredients in ten per cent. solutions. For portrait work the soda developer was the best. He had found that the general fault with amateurs was under-development. The plate was not sufficiently developed until the image seemed to be disappearing from the plate, and, on turning it over, the high lights were showing through the bromide. It was better to carry the development too far and then to reduce than to under-develop and intensify. The influence of the temperature on the developer was very great on the density and brilliance of the negative. In the summer the alkali should be reduced. A very good cure for green fog was to immerse the plate in a weak solution of bichloride of mercury for a very short time. This solution would also get rid of metallic lustre, sometimes seen round the edges of stale plates.

Hackney Photographic Society.—June 9, Mr. W. P. Dando in the chair.—Samples of the Barnet plate were distributed. The HON. SECRETARY reminded members that after this month meetings would be held every Tuesday at 206, Mare-street. Mr. DEAN asked how it was he had been troubled with silvering on Ilford isochromatic plates? Mr. BECKETT said it was probably due to having forced the plate, or the fumes of gas having come to them. He advised the use of a wash leather and methylated spirit, which would remove silvering. The CHAIRMAN said he had taken a view in Epping Forest last Wednesday as late as 6 p.m., under trees, with *f*-44, and gave a twenty-seconds exposure, and had to develop it very carefully. The subject was a very dark one. Mr. Beckett showed a picture taken in the Forest, in which he had given over twenty exposures, making over one-minute exposure, the trees being moving at the time. Mr. Goaling showed a snap-shot exposure of tennis players. Mr. SODEAN handed round some microscopical work done on the Imperial plates, which, he said, he was pleased with. Mr. HENSLER asked which was the best exposure for clouds—fast or slow? It was said that a slow exposure later in the day would do, but in the middle a very rapid exposure was essential. Mr. SODEAN then gave a very good account of lenses, *Single* v. *Rapid Rectilinear*, using diagrams. The CHAIRMAN liked single lenses when they were good, but he said they were hard to get. Good makers made a speciality of them. He had used them on architectural subjects successfully, and handed round several prints he had taken in France with single lenses of nine, twelve, and fifteen-inches foci, at an aperture of *f*-8 or *f*-11. The subject then turned to a discussion on *Halation*. Films were considered more rapid than plates, and prevented, in a marked degree, halation. Mr. BECKETT had tried several backings, but preferred that given by Mr. Teape, which was:—Caramel, one ounce (allow a little extra, say, one-third, for waste); burnt sienna, one ounce; methylated spirit, one ounce; water, one ounce. Boil until sugar has lost its taste, which would be about 1½ hour. Mr. Hensler had used several backings, had used among them Bates' black, which was very dirty. The CHAIRMAN said he had reduced halation by using methylated spirit with its equal amount of water. It was a tedious operation, but an interesting book read to him whilst doing it tended to reduce the ennui.

South London Photographic Society.—June 8, the President, Mr. F. W. Edwards in the chair.—A paper was read by Mr. A. Horsley Hinton on *Our Aim in Landscape Work: Some Suggestions, Practical and Otherwise*. The lecturer dealt with many matters relating to the application of art to photography, so that any of the members present might turn his suggestions to account on the next field excursion. To start some thinking and to awaken fresh ideas, and to produce artistic pictures was his wish. If a picture was to express the repose of evening, the sentiment of repose is strongly awakened by the scene selected; inversely, if the scene which arrests attention and moves one to seek its reproduction suggests, when quietly studied, "repose," then the finished picture should also suggest the same feeling. If photography cannot do this, its art claims are utterly vain, and art by photography is impossible. After the selection of the subject comes the treatment. Everything in the picture must be subordinate to the sentiments if there be such an object as a church tower, a bridge, a cottage, clearly defined or strongly indicated, so that the spectator, on looking at the picture, says at once, "Oh, that's So-and-So church," or "Isn't that near such-and-such a place?" It is clear that the component parts of the scene are not subordinate to the sentiment. The remark the picture should suggest is, "That's very restful—so suggestive of evening." Sentiment will never be uppermost when the subject itself is obtrusive, by the very broad or even indistinct representation of the objects we may avoid overpowering any sentiment which may be suggested; by the suppression of the material, we render possible the expression of the ideal; by the subordination of everything that shall of itself excite interest, we give the spectator an opportunity of discovering and recognising the feeling, the idea which in the first instance impelled us to make the picture.

Brighton and Sussex Natural History and Philosophical Society (Photographic Section).—June 10.—The subject for discussion was *Hand Cameras*. Mr. BALDWIN, of the Eastman Company, exhibited and explained the new "Kodaks," which were much admired. Mr. A. E. Stuart showed the "Vanneck," Mr. C. Job showed "Eclipse," Mr. E. J. Bedford "Chadwick." Messrs. Hardcastle and Willi[illegible]n lent various other instruments of this class. Two members also brought cameras of their own designs, and promised to report later on. A special meeting was held the same evening to elect a Chairman, Mr. Caush having been chosen as the President of the Society, and one member to the Committee. Mr. J. P. Slingsby-Roberts was selected as Chairman, and Mr. A. H. Webling as Committeeman. The meeting was largely attended.

Lewes Photographic Society.—June 7, the President (Mr. J. G. Braden) in the chair.—Mr. J. Whittall was elected a member of the Society. Mr. E. J. BEDFORD read a paper on *Perspective as Applied to Photography: the Use and Abuse of Wide-angle Lenses*. He explained, by means of diagrams on the blackboard, the points connected with linear perspective, and which were necessary to know in order to fully understand the action of a wide-angle lens. At the conclusion of the paper a discussion took place, and a cordial vote of thanks was accorded to Mr. Bedford for his paper. The PRESIDENT announced that, as he would shortly be leaving the town, he would be obliged to resign his seat—a proceeding which he much regretted, as he had held it since the com[illegible]ment of the Society in 1888. He congratulated the members on the [illegible] state of the Society, and said he should still continue a member and watch with interest its proceedings. A vote of thanks was passed to the President for the able way in which he has presided over the Society, and which in a great measure accounted for its successful career so far. An excursion takes place on Saturday to Herstmonceux Castle. The Eastbourne Society will join. The train leaves Lewes at ten minutes past twelve.

Edinburgh Photographic Society.—June 8.—The concluding meeting of this Society for the season was delayed for a week, in order that it might be held in the new rooms, 38, North Castle-street, which, although not quite completed in all details, were sufficiently so for this meeting, and will be thoroughly ready before the coming Convention in Edinburgh. The new home of the Society is very conveniently situated, and, when finished, will afford much more comfort than hired rooms for the general purposes of the body although not sufficient for the popular meetings, which require a hall commodious enough to hold at least 800 people. They comprise a large hall, with committee-room on the first floor, and on the next are reading and smoking-room, a large dark room, with all appliances, with private lockers for individual members, and further accommodations for a caretaker are within the building. The chair was occupied by the President, Mr. Blanc, Architect, A.R.S.A., under whose gratuitous and anxious care the necessary alterations have been carried out.

In opening this, the first meeting in the new rooms, he called the attention of the members to the fact that the Society was now in its thirty-first year, and that the modest terms in which the intimation of the opening of the new premises had been stated by the Secretary doubtless arose from the knowledge he had that their new premises would be no more than occupiable at the time, and consequently not in a fit state for members and friends. Fortunate it is, therefore, that a formal opening, with its accompanying address from the chair, are not expected this evening, because, under the present unfinished conditions of our new accommodation, it might be difficult to stir enthusiasm or gather inspiration. With your permission, he said, I am constrained, in a word, to extend to you the Council's congratulations upon the accomplishment so far of the long-cherished wish of the Society, and to express the desire that, with the increased facilities offered by the acquisition of these apartments, the Society will proportionately increase its own usefulness, and add still more to the laudable record it can boast of, as having contributed during the past thirty years some of the foremost thinkers and workers in the art-science of photography. Thirty years is a long vista to look through, and it is a comparatively long life for a Society to boast of. It is doubtful if there are many present or even many on the Society's roll, who are the original men who, in 1861, formed this now popular Society. If there are, then let us extend to them a cordial word of thanks and congratulations—thanks for the fortunate thought that conceived the formation of such a Society, and congratulations on their being able now to witness the happy result of their acts. That movement, from a small beginning, has now developed an Association realising an aggregate as high as that of any similar society in the city, if not the kingdom. Its members have from the commencement steadily increased, notwithstanding the fluctuations incidental to the composition of such societies, and, though its progress in the particular direction of its object has been at varied rates, yet happier are we that the progress has been steady rather than as a series of spasmodic efforts that leave only uncertainty in their train:—

"Science moves but slowly,
Slowly creeping on from point to point."

That alone constitutes true progress. A statistical American once asked one of our recent civic rulers, "What was, or is, Edinburgh's industry?" "Her schools" was the reply—a statement that could have been made with verity 200 years ago, and it is still applicable. Our city has, in short, always taken a foremost place among cities as a nursery of law, medicine, and literature, and to these may be added its societies devoted to the advancement of the arts and sciences. It was natural, therefore, that when the early whispers of the new art-science, which was being diligently studied and experimented with on the Continent by the elder Niepce, assisted by Daguerre, fell upon the intellects of this city, there should be aroused a spirit of earnest curiosity, combined with the desire to penetrate the mine, however deep and dark, and however difficult to excavate. What these two leaders devoutly struggled for was, as we all know, left to Mr. Fox Talbot to accomplish, and by him was the photography we have, with its indispensable repeating negative, made the commercial possibility it now is. A few congenial spirits were known at about the same date, and for ten or fifteen years afterwards, such as Howie, the miniature painter, Popowitz, Orange, Georgiades, mainly foreigners, to work the Daguerreotype process; but the revolution caused by Fox Talbot enlisted at once quite an array of workers who entered the field in our city. Studying as they now practised the fascinating art-science, experiments were made in the effects of light on many different substances, and the outcome was the discovery by Mungo Ponton (1839) of the action of the chromic salts on all bodies of a colloid nature, such as starch, albumen, gelatine, &c., and thus from our own city emanated the carbon process, which, now allied to many others more mechanical, has given birth to so many and wide-spreading industries. Further, from the pages of the Transactions of the Royal Scottish Society of Arts of the same year (1839), we learn that another Edinburgh citizen, C. J. Burnet, first discovered and made freely known what only came into practice many years later, namely, that, to secure the development of the pictures by this process properly, we must expose on one side of the film, and develop on that which had not been exposed to light. It was natural that so interesting a novelty as photography showed itself to be should animate its followers in a like direction, and, as a consequence, the Photographic Society of Scotland was formed, under the highest auspices. Its membership increased rapidly, so fascinating did the new art-study become; but this Society's aims proving too ambitious, and the business of its meetings pertaining rather to dilettantism, it lost popular favour, and gradually passed away. Phœnix-like, however, there arose, not precisely from its ashes, but from its slowly advancing death, a few of the earnest workers who sought to perfect themselves in this special line of knowledge, and naturally so, by friendly meetings at which all new discoveries were brought forward and ideas interchanged. These informal gatherings took ultimate shape, and, after a successful effort at fixing them as weekly meetings, it was finally resolved to constitute a new society, which has continued to bear and to carry on, we submit, successfully and creditably, its work as the Edinburgh Photographic Society. The meeting at which the resolution was carried into effect was held in Buchannan's Temperance Hotel, High-street, and nothing, it seems to me, can be more interesting than to, at this long-after period, recall the names of those present. First we have Mr. J. Traill Taylor, the first Secretary of the Society, and now the well-known editor of THE BRITISH JOURNAL OF PHOTOGRAPHY; Mr. Geo. H. Slight, then engineer and now under the Honourable the Trinity Board; Mr. Andrew Mure, advocate, now Supreme Judge of the recently afflicted Isle of Mauritius; Mr. Archibald Burns, of Messrs. Oliver & Boyd, and well known before his death as a photographer whose negatives of the picturesque bits of old Edinburgh have scarcely been excelled; then we find Mr. Galloway, a writer now deceased; later, James Ramage, the art-manager of the Messrs. Nelson & Sons printing works, and Mr. W. H. Davies, who has held almost every office but my present one in the Society, and to whom, as he has never lost interest in any matters bearing on photography, I am indebted for these very interesting facts. The first members elected after the constitution of the Society, and on the same evening, were Mr. J. Valentine, sen., of Dundee, and Mr. Buchanan, the hotel proprietor, both of whom remained members till their respective deaths. From this it will be seen that the Society was at first chiefly composed of amateurs; but, as photography increased its hold on public patronage, the number of professional members increased rapidly, and so they became blended into the general body of the Society. A glance at the early minutes of the Society is not only interesting, but instructive; as many energetic minds were drawn by sympathy to the various departments of photographic work, the meetings invariably produced something of novelty in mechanical contrivances, or in chemical discoveries, in knowledge of optical science and appliances, and the rapid evolution of new ideas thus produced set the Society afloat on very propitious and popular lines. The Society was honoured by its first President in the person of Mr. J. D. Marwick, then Town Clerk in this city, now Sir J. D. Marwick, City Clerk of Glasgow. He held office for seven years, retiring to create a vacancy that, as he said wisely, fresh life might be infused. He was succeeded by Sheriff Hallard, known in the Society as an ardent and enthusiastic worker in photography, and, beyond that, as a

genial citizen and a fair and impartial administrator of justice. For a long period afterwards professional photographers filled the chair, among whom it may suffice to mention the names of Tunny, Moffat, Ross, and Nelson, and more recently we have had such high professional men as Dr. Sidey, M.D., F.R.S., Mr. Norman Macbeth, R.S.A., Mr. James Lessels, architect, to each and all of whom the Society is more or less indebted. From the beginning, the Society frankly recognised that so interesting a study as photography could not be limited, and so an invitation to ladies to participate in membership was initiated, a call which, however, has been responded to hitherto in a very limited degree. There is no reason why this should not be improved in the near future. With such an interesting record, are we not, then, stimulated to new exertions and to still greater achievements? We have a large and, I venture to think, a vigorous membership, and, with the machinery with which we are about to be equipped, the possibilities of further strides are in our favour. If anything should tend to the consolidation of a Society and be a powerful factor in its development, I can conceive of nothing more potent than the common interest arising from a joint proprietorship. Here we have that interest; for a comparatively nominal subscription we possess a well-ordered suite of apartments, comprising meeting-hall, committee-rooms, smoke and reading-rooms, with facilities for seeing and studying the journals and literature of photography, and the inevitable dark room, with ample store accommodation, and all under conditions which shall render them attractive; and we wait with much interest the result. It would be premature to suggest, and I would therefore postpone to a future meeting the consideration of many projects which occur as to the means by we can make this advance a genuine movement for good, both to the individual members and to the Society as a whole. The age is distinguished on all sides for the acquisition of knowledge; I trust, therefore, this Society will not be found behind in its willingness to give from its stores such knowledge as it possesses, and so increase the attraction to all interested in photography. The formation of sectional classes for instruction, the encouragement of afternoon rambles, a lecture syllabus, annual exhibitions of work, and the formation of a Society album, in which all prints shall be permanent ones, are a few of the many projects that occur as being worthy of being kept in view, and thus extend our influence for good. Among the many causes for congratulation, the acquisition of these rooms at this time is singularly appropriate and satisfactory, as you are aware arrangements are now completed for the reception of the Photographic Convention, whose visit to the city takes place during the week from the 11th to the 16th of next month (July), and your Council feel assured the Convention will gladly recognise the life and energy exemplified by the Society in taking this important step. It is to be hoped, however, that members will not be satisfied to allow the Society to rest its reputation alone upon the exhibition of the new rooms, but will establish the Society's efforts, and verify its existence by a personal presence at the chief gatherings of the Convention. Thus only can the Convention be assured of the reality of our faith and the earnestness of our aims and aspirations. Let us support them loyally as far as is in our power, and help them to carry away happy memories of pleasant associations from our own romantic town. One word more, and I finish. What has been said of our duty to the Convention has greater force applied to our own Society, and I take the liberty to say it, that towards the accomplishments of the Society's aims united action is indispensable, all pointing to the one end, namely, that of justifying the continued existence of the Society by increasing its influence and usefulness, by encouraging a true regard for every one joining its ranks, by courteous consideration of what may seem to be the least important contribution to its business; and, while remembering that all things should be done decently and in order, let us not, by over-zealous desire to abide by that rule, lose sight of the real object of our meetings, our mutual improvement in the art-science of photography.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

THE ECLIPSE CAMERA.

To the EDITOR.

SIR,—In the last number of THE BRITISH JOURNAL OF PHOTOGRAPHY there is given the specification of a patent which has been taken out by Mr. Fox Shew for improvements in hand cameras of the character of the ingenious "Eclipse" Camera, devised by George Lowden, and made by Messrs. Shew. The first part refers to a mode by which the camera can be fitted for lenses of different focal length. It is simple, and I have no doubt efficacious, and, though I have not myself had occasion to use lenses of different powers with my camera, it will undoubtedly make this form of camera more generally useful.

The second part has reference to a mode by which "the back of the camera can be adjustably held within certain limits at any angle with the front part thereof," this being accomplished by making the back of the camera of two frames instead of one, to one of which the wings or sides are attached, and to the other the rear end of the bellows body, the one being worked in the other by rack and pinion, and fixed where required by binding screws. This plan I had applied to my camera in March last, principally, no doubt, as a means of focussing (the want of which, except by sliding the lens in a tube, which was unsatisfactory, being a serious defect in the "Eclipse" form of camera), but also to give a limited power of "swing back" to the camera. The main "swing-back" power, however, in my camera, is got by a very simple arrangement of the head of the camera, by which raising the lens is combined with what is equivalent to a swinging of the back. I am thus entitled to claim priority over Mr. Shew in regard to this second part of his specification. I do not, however, desire to interfere with his patent in any way. The improvement was so simple and so obvious (merely an adaptation, in fact, of the old-fashioned double-bodied camera), that it never occurred to me to be worth patenting. It seems now, however, as if any new screw or slot introduced into a camera was worth patenting. I often wonder what my income would have been now if I had patented the "Kinnear Camera," which I invented in 1857, and described in the *Photographic Journal*. As then brought out, with the addition of one or two improvements I made on it next year, and described in the *Journal* of 1859, it is, in all essentials, the camera which is now in universal use, and is made by hundreds of thousands.—I am, yours, &c., C. G. H. KINNEAR.

12, *Grosvenor-crescent, Edinburgh.*

SPEED OF PLATES.

To the EDITOR.

SIR,—Your issue of May 20 contains a letter under this heading from Mr. Alfred Watkins, to which I think some reply should be forthcoming.

I have had considerable experience with the exposure meter, and consider it a valuable photographic instrument. Why? Because its indications give me good pictures. I have also had some experience with the actinograph, and also find this an excellent help, for precisely the same reason.

Moreover, if Mr. Watkins will obtain a dozen plates whose actinograph speed is known, and determine the plate number for the exposure meter, he will be in possession of a ratio which will serve to convert the actinograph speed into plate number for any other plates whose actinograph speed is known.

Let me grant, with Mr. Watkins, that the light of a standard candle is subject to variation; so is the daylight to which the sensitive paper of the exposure meter is subjected, and subjected *before* the exposure is made, and therefore to some extent different from the light *during* exposure. This variation is often far greater than that of the standard candle. The error of judgment as to when the tint of the paper is the same, or equally dark as the standard tint, is also open to considerable error. My position is that, in spite of the many sources of error to which both instruments are liable, they are both valuable indicators of correct exposure when carefully used and with properly determined constants.

When using the meter, Mr. Watkins advocates the use of different subject numbers for objects of light, medium, or dark colours; I do not see the propriety of so doing where the nearest possible approach to correct representation is aimed at. Let us suppose three houses; light, medium, and dark. Let the medium house require subject number 100; if not, paint it so as to require this number. In like manner, let the other houses be so light and so dark, respectively, as to require subject numbers 50 and 200. Can these three houses be correctly represented on one plate? If not, the subject numbers fail to help us, as does the actinograph; neither instrument can help us to photograph an unphotographable combination. Can they be correctly photographed? Then *one number* must serve for all three. I always use the No. 100 for such compounds of light and shade as are ordinarily met with in views, and find the result practically correct.

The cases where the subject numbers 200, 300, or more are mainly applicable, say the photographing of dark interiors, paintings, &c., are cases where the actinograph is evidently unsuitable; and an argument against the actinograph under such circumstances is like saying that a sun-dial will not work by moonlight, which everybody knows.

I do not quite follow Mr. Watkins' suggestion to use a Spurge's sensitometer, to determine the speed of plates. As I gather, he would expose a plate behind the instrument for a certain time to a standard illumination, develop, and compare with a plate of standard density. Suppose that, in one plate thus treated, the portion exposed behind hole No. 4 matched the standard tint, and that in a second plate the portion behind No. 9 matched the standard tint. What inference would he draw from this experiment? That the speeds of the plates are inversely as the areas of apertures? From all I know of the action of light on the photographic film, I doubt whether this would be a correct inference; indeed, unless I am entirely wrong, this inference is baseless. No conclusion can be valid from such restricted observations. The behaviour of the plate to many varying amounts of illumination must be studied before a correct verdict as to the rapidity of the plate can be pronounced. We have to find the first term of a series of illuminations, ever doubling, in which the densities of deposit increase, approximately, by equal differences. That only can be the real criterion of the rapidity of the plate; the actual density of any one portion is no guide whatever.

I see, from a subsequent letter of Mr. Watkins', that he makes use of Captain Abney's photometer. Would he be so good as to inform me what is the exact meaning of the numbers denoting the transparency of a film with that instrument? Mr. Channon supposes them to be percentages, though, as Captain Abney quotes numbers higher than 100, this can hardly be the case. I have tried to ascertain what they really are, but have not succeeded.

I presume that they are the same numbers as Mr. Watkins' uses to express opacity in his letter of May 28.—I am, yours, &c.,

Ash Club, Manchester, June 6, 1892. R. C. PHILLIPS.

"COSMOS."

To the EDITOR.

SIR,—"Junior" concludes his letter of the 4th with an impeachment of my credibility. For him the terms "not long ago" and "several years ago" are of a sufficiently contradictory nature to warrant an insinuation of untruthfulness. This eagerness to convict me of falsehood scarcely indicates an honourable opponent's disposition or desire to entertain an explanation in maintenance of my veracity, and I therefore propose to leave your correspondent undisturbed in his persuasion to the contrary. Everybody, however, endowed with ordinary intelligence (among which class "Junior" restrains me from including him) understand

quite well how easy it is in writing and speaking to misuse such phrases as he picks out, as well as many others of an equally inexact character; and consequently are above the paltriness of converting pardonable vagaries of expression into evidences of prevarication.

I am puzzled to understand why my anecdotal reference to the snubbing with which the younger members of a photographic society I formerly belonged to (probably when "Junior" was in long clothes) were treated by their seniors, should be taken to apply to the London and Provincial Photographic Association, of which I do not claim membership, of whose discussions my knowledge is simply gained through the reports in your pages, and to my presence at whose meetings a residence nearly two hundred miles from London would be an obstacle. In denying assertions which were not applied to his society, your correspondent gives such a sorry exhibition of mingled impetuosity and stupidity that I am surprised at his possession of the flash of wisdom which led him to withhold his name and thus spare him the ridicule of his fellow members. I never "supposed" that the junior members of the Association were snubbed week by week, and even "Junior" himself cannot put his finger on such a supposition either implied or expressed, or why does he "deny the truth of assertions *if* applied to his Society?" If I supposed or asserted anything as to the Association why "Junior's" "if," and as I did neither, why his denial?

In accusing me of gibing and sneering at Mr. Haddon "Junior" is guilty of a piece of exaggeration as malicious as it is inexplicable. I appeal from the verdict of a judge whose bitterness of attack perplexes me by its total lack of provocation to the impartiality of any unprejudiced reader of this correspondence. Mr. Haddon's advice to amateurs to make collodion positives, as well for the reasons given as for others, may be excellent enough in the abstract; but, Sir, I ask, in all good faith, what earthly chance does it stand of being put into practice by modern amateurs? Mr. Haddon—whom I do not know, but whose contributions to photographic knowledge I have esteemed for many years—would probably himself be more surprised than anybody else to see his counsel taken. It was because I regarded his recommendation to amateurs to take up bath photography while dry plates hold the field as so much waste of breath, that I ventured, good-humouredly I submit, to ridicule the advice. In so doing I did not intend to exceed the limits of fair and legitimate criticism, and I don't think I have. I have no means of knowing whether Mr. Haddon takes an opposite view of my remarks, but if he does I trust he will believe that nothing was farther from my design than to "gibe" and "sneer" at him, a form of comment in which his impulsive young advocate seems to me to shine with a success I can never hope to emulate.—I am, yours, &c.,

COSMOS.

June 14, 1892.

PHOTOGRAPHIC PRINTERS.

To the EDITOR.

SIR,—The interesting series of letters now appearing in THE BRITISH JOURNAL, *re* printers and the difficulties they have in finding employment, opens up a wide field for discussion. It is not only in the ranks of the photographic printer that there are causes for lamentation, but the operator, retoucher, reception-room attendant, and mounter and finisher, have also solid reasons for complaint against the tendency to employ the *cheap and nasty* order of worker. Salaries, as any one who is in the know is well aware, have been for some years now, on the downward grade. 1st. Chiefly because of the over-crowded state of the photographic labour market. 2nd. And of no less importance in its bearing upon bad trade generally, is the want of *proper respect* for their calling amongst certain classes of professionals; for, if these gentlemen who work on the "given away with a pound of tea" principle, *had* any respect for photography (or themselves) they would never descend to such means, nor would the "one cabinet and three C. D. V.'s for 2*s.* 6*d.*," and the "one 12 × 10 beautifully finished enlargement given with one dozen cabinets" fraternity pursue the (un)-even tenor of their ways without many a twinge of conscience. Of late years quite an army of cheap and nasty little dealers, retouchers and enlargers to the trade, have sprung up like mushrooms. These are the people who pander to the wants of the cheap and nasty amateur and professional, and to the semi-professional, who poses as an amateur, but who is a blackleg. Returning to the subject of the overcrowded labour market, it is overcrowded simply because it is glutted with the "Learnt it in six months!—can operate, print, tone; clever with children; salary, 25*s.* per week!" photographic wasters—the class of people who, having failed to become good tea-grocers' assistants, clerks, drapers, &c., &c., take up photography as a means of earning a livelihood. In conclusion, I say that if only employers had but the courage to keep up their prices, and be a little less apathetic to their own interests, they would be able to pay better salaries, employ better assistants, and therefore do better work, and instead of helping to drag photography through the mud, assist to place it on a higher pinnacle in the estimation of the public than it now holds. Again I say, employers keep up your prices, employ none but competent people, have nothing to do with the cheap and nasty order of dealer, and do not deal with those firms who do everything they can to catch the amateur at the expense of the struggling professional. I am, yours, &c.,

F. J. A.

June 14, 1892.

To the EDITOR.

SIR,—I have read with great interest the correspondence in your valuable paper "*re* Photographic Printers."

My experience has been similar to those already given in the pages of the JOURNAL.

Notwithstanding the fact that for some years I was connected with one of the principal firms in the kingdom, and possess testimonials of the highest order, I have found great difficulty in obtaining a permanent engagement.

The statement that good printers are scarce, and difficult to obtain, is not correct.

True, there are many duffers in the profession; but who is to blame? The photographer who, rather than pay a man a decent salary, engages a duffer at a very small salary; and because he does not prove a success, stigmatises the whole race of printers as bad.

Mr. Editor, printers have their grievances as well as those who employ them; and if photographers want good work, they must be prepared to pay a wage at least equivalent to that received by a bricklayer's labourer, not the paltry wage as at present offered.

Moreover, let them provide proper accommodation for a printer to do his work, and not push him into some out of the way corner, useless for any other purpose, and then complain if his work is not good.—I am, yours, &c.,

H. D.

June 6, 1892.

RED LIGHT AND THE EYESIGHT.

To the EDITOR.

SIR,—I notice one of your correspondents complains of his eyesight being affected through the use of red light in the developing room. Some time ago I was similarly affected, and no doubt, like many others, was almost colour-blind for some time. I, however, had a sheet of green glass running on rollers, and when the work was finished, instead of changing immediately into strong light, I turned on the complementary colour, and after a few moments found my colour-sight restored, and felt so much benefited that I would like others to try it for themselves. I suppose, in the case of orange or yellow light being used, its complementary (blue) would have the same effect.—I am, yours, &c.,

OPERATOR.

London, June 8, 1892.

"AN OLD PRO.'S" WAIL.

To the EDITOR.

SIR,—I sometimes think we professionals are falling out, because of our modesty or want of asserting our position and rights. We have no trade union or guild, no badge, decoration, or letter to show ourselves accredited members of an honourable calling; and no means of keeping any from infringing what is our position or rights. We cannot get our goods at a special trade price from dealers; when we work to a middleman, we are sweated to get the lion's share; when another does jobs we could have done, while we pay rent, taxes and extra insurance, he is free of these and we have no redress. I see at a Liverpool society, where the members do everything photographic for pleasure and nothing for pay, one party did some thirty dozen films 10 × 8 on the Continent last season; and a gentleman is going to the Land of the Midnight Sun with some thirty-five dozen 5 × 4. A wonder to me, "Poor Pro.," how does this kind of thing pay? Could you put one up to the secret of their trade? We might go in to amateur it. There must be money somewhere. Can't you tell us how to get a bit of the meat, or, if not, a bit of the bone, for our old gums?—I am, yours, &c.,

AN OLD PRO.

June 14, 1892.

LIGHT CAMERAS.

To the EDITOR.

SIR,—Will you please tell me the weight of the lightest half-plate and whole-plate tourists' cameras that are made? The reason is, I am a carpenter and amateur photographer, and have just made a whole-plate camera which only weighs three pounds ten ounces. I have shown it to several friends, both professional and amateur, and they all say it is lighter, more rigid, and compact than any they have seen. The size outside is ten inches by ten inches.—I am, yours, &c.,

F. POLLARD.

31, *Pynlimmon-road, Hastings, June* 14, 1892.

[We must confess to not having scaled the various types of cameras extant with a view to discovering which boasts of being the lightest made, but a whole-plate that only weighs three pounds ten ounces is certainly extremely light.—ED.]

Exchange Column.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

T. K. (Darlington).—Thanks.

J. C. HUGHES, SCOTIA, E. W. A. S., and others.—In our next.

R. G.—Yes; the developer on bromide prints should be kept in motion.

R. D. SMILLIE & Co.—It is described in this JOURNAL for March 11 of this year.

MERCURY.—1. There is no frame on the market for printing wood-blocks. 2. We do not know what paper is most read by wood-engravers.

IMPROVER.—North America, as a field for photographic operators, is in no sense superior to Scotland; hence we do not advise you what part of the States to go to.

METAL.—Try the effect of diluting the ammonia with its own volume of water. To ascertain when fixation is complete, test successive ammonia baths until no silver chloride is precipitated.

W. JOY.—Saxe paper is to be had in continuous lengths of about four feet six inches wide. But we do not know where it is to be had in small quantities. It is usually sold by the roll, weighing a hundredweight and upwards.

J. KNOWLES.—It is quite impossible for us, or any one else, to say, by simply looking at it, if the mount contains anything that would act injuriously on a photograph. It can only be ascertained by a careful chemical examination.

S. KARL asks: "If a thing is patented—say, a detective camera—can I make (legally) one for my own use? Of course, I know I must not make for sale."—It is illegal to pirate a patented invention even if the article is not made for sale.

EXPERIMENTALIST.—For a lens of the rapid type, of one and a quarter inch diameter, we should much prefer a prism to a mirror for taking reversed negatives. With lenses of large diameter, the mirror is to be preferred on account of the cost.

A. E. F.—The pictures are, on the whole, very good, but would have been improved by a little less exposure, and printing on a better sample of paper. The lighting of one is rather poor. With a little more practice, you should meet with fair success.

R. B. Y.—If the lens be symmetrical, it does not matter which combination be used as a single lens. Arrange the convex side so as to be next the ground glass. The stops, as fitted in the tube, though not being in the *best* position, will answer every practical purpose.

H. J. D.—Yes; white, hard varnish, thinned with methylated spirit, is often used for varnishing negatives. It is not so durable as "brown hard," as it is more liable to abrasion with rough usage. The slight colour in the thin film of the latter varnish will practically be of no disadvantage.

P. McN. asks if any one is allowed to take photographs of any of the ancient statuary in the British Museum.—Yes, by first obtaining permission of the authorities. Make formal application, by letter, addressed to the chief librarian. It will be well to state in the application the purpose for which the photographs are required.

BERKS.—The prints forwarded are very pretty lane studies, but we think the negatives have very little, if any, commercial value. Berkshire lanes are very like the lanes of most other counties. You might, however, submit copies to some of the publishing houses, such as Poulton & Sons, Lee, or Frith & Son, Reigate. They would be the most likely purchasers of the negatives.

C. M. MOSES.—We can scarcely imagine the negatives blistering, at this season of the year, directly the developer commences to act, unless the developer or the water with which it is made had been exposed to the heat of the sun; moreover, we have never heard of blistering with the brand of plates you are using. Make another trial. This time be sure that the developer is of the normal temperature.

BENJAMIN C. asks the best material with which to coat a large wooden trough that is to be used for silver solutions for sensitising paper?—One of the most inert materials, and, at the same time, one of the best waterproofers, is paraffin wax. Before applying it, the wood should be made perfectly dry and warm, indeed hot. Expose the vessel for a few hours to the heat of the sun's ray, and then apply the wax in a fluid condition evenly with a hot iron or spatula.

MIDLANDS writes: "I have a very strong impression that a photographer in our town is sending out bromide prints for platinotypes, although he charges for the latter, and at a high figure too. Can you tell me how I can test one of the prints to see, for certain, by which process they were made?"—There is a very simple test. Immerse the suspected print in a solution of bichloride of mercury. If the print be a silver one, the image will be gradually bleached; if platinum, it will be quite unaffected by the treatment.

R. BOTWRIGHT asks how reversed negatives, as regards left and right, are made for photo-mechanical purposes.—There are many ways of making them. They may be taken direct by means of a prism or mirror in front of or at the back of the lens; or the sensitive plate may be placed in the dark slide reversed, and the negative taken through the glass, which, of course, must be clean on its surface; or the film may be stripped from the glass by Plener's method with fluoric acid. There is yet another way. The negative may be reproduced in the camera, either the transparency or the negative being reversed in the copying. All these methods are constantly being employed. There are others, however.

S. BLOUNT complains that when making, or rather attempting to make, lithographic transfers, for transferring to stone, he cannot get the transfer ink to leave the paper clean when it is treated with the warm water. He says he can get the ink away by rubbing somewhat hard, but it leaves the paper dirty, which soils the stone, and wants to know the reason.—As he does not say how the paper is prepared, or the kind of ink employed, it is difficult to reply. Presuming, however, that he uses the paper and ink sold commercially for the purpose, the reason may be that the paper was kept too long after sensitising, or that the ink was used too thick. A very prolific cause of this trouble is when unsuitable negatives are employed. Unless the negative is specially suited to the work it is impossible to obtain clean transfers.

A. PHILLIMORE complains that he has several lots of sensitised paper that he has purchased lately, but upon none of it can he get a rich, deep tone. He says: "Before they reach that stage they become woolly, and, after they are fixed, they are like the colour of mud. It cannot be the fault of the negatives, as when they are printed on ——'s paper I get just the deep tones I desire. But there, that paper is dear. Can you give me a word of advice?"—If the negatives will yield rich tones with some papers, it is clear that they cannot be blamed. Some papers, however, will not tone beyond the warm brown stage, though they will yield good prints of that colour. We can only suggest that our correspondent be content with that tone until the paper is used up. Then procure a supply of that which gives the tones desired.

A. W. FARLEY complains that rain, by coming through the roof of the studio, played sad havoc with his backgrounds, &c., all of which had been recently redistempered for the coming season, and now have stains where the water has trickled down. He asks what is the best to be done, as he does not wish, if it can be avoided, to have to go to all the expense over again?—We fear there is now no remedy. If the evil is discovered at the time, stains may often be obviated by making the background evenly wet all over, and then allowing it to dry spontaneously. The only thing we can now suggest is to make the backgrounds, or, by way of experiment, one of them, thoroughly wet, and then work it well and evenly all over with a soft whitewash brush, and then set it aside to dry. Sometimes this treatment will get rid of this kind of stain, but not always. Anyhow, it is worth the trial.

P. O. M. says: "A few months back I sold a number of local views to a visitor to the neighbourhood. He had them mounted and bound up as a folio by a bookbinder. Now all the prints are fading, and he wants me to replace them, threatening if I do not that he will sue me not only for the value of the prints, but for the cost of the book as well. As my own prints, mounted and unmounted, made about the same time, show no signs of fading, I suggested that the mounting material or the boards were the cause of the fading. I have just ascertained that the prints were mounted with the ordinary paste used in the workshop. What would you advise?"—We should say, Resist the claim. If paste such as is used in some workshops is employed for mounting photographs with, there need be little wonder at their quickly fading. If our correspondent can prove that a deleterious mountant was used, it will be a good defence to an action.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—June 18, Outing down the River. First boat after two from London Bridge. 23, *Intensification.* 30, Annual General Meeting.

PHOTOGRAPHIC CLUB.—June 22, *The Relative Permanency of Prints by the Various Methods in Present Use.* 29, *Plate and Film-changing Appliances.* 18, Saturday outing down the River. Boat from Old Swan Pier at two o'clock.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—June 20, *Hand Camera Work*, Mr. James A. Sinclair. July 4, *Can our Excursions be made more Interesting and Useful?* Mr. J. F. Kelly. 15, *Photographic Dodges and Combination Printing*, Mr. J. Miller. Visitors invited.

KIMBERLEY CAMERA CLUB.—The annual general meeting of this Club was held on Friday, May 13, when the following were elected office-bearers for the ensuing year:—*President*, Rev. Father Ogle; *Vice-President*, F. Skead, Esq., B.A.; *Hon. Secretary and Treasurer*, Malcolm Macfarlane; *Council*, Messrs. C. A. Chappell, A. Gasson, and J. Henry.

GLASGOW PHOTOGRAPHERS' HALF-HOLIDAY.—Messrs. Turnbull & Sons' *employés* and friends had an outing on Friday last to celebrate the movement recently adopted in Glasgow. The party was under the care of Mr. John J. Moran, who was instrumental in bringing the half-holiday movement to a successful issue. The location was a charming spot on the Clyde—Inverkip; and the company, numbering over seventy people, indulged in games, dances, sports, and a visit to the beautiful glen, and returned home, after spending a most enjoyable meeting. The firm very kindly closed earlier than usual, so as to enable the *employés* to have as big a day as possible, which was much appreciated.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

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LONG-FOCUS SINGLE LENSES FROM RECTILINEAR COMPOUNDS.

A question frequently arises as to whether it is not possible to employ, for landscape purposes, one only of the two lenses that form a rectilinear combination. If the front lens be removed from the mount, and the back one alone left *in situ*, a very excellent landscape objective, of about double the focus of the combination, is obtained. When used in this way, the diaphragm will be found to be rather too close to the first surface of the lens, and, to ensure the best results, the distance between them must be increased. This is sometimes conveniently effected by placing a cap, pierced with appropriate apertures, on the outer end of the tube, from which the anterior lens has now been removed. It is occasionally done, too, by a supplementary ring screwed in the rear end of the mount, and into which the lens in turn is adapted.

It will be observed that this implies a very considerable lengthening of the camera, and it is often found, to the chagrin of the user, that the camera will not extend sufficiently far to admit of the subject being brought into focus, for it must be borne in mind that, although the focal centre—that portion from which, in a *combination*, the focus is to be measured—lies practically mid-way between the lenses, or at the centre of the tube, this is not the case when one of the lenses is to be used alone in the manner described, for now the focal centre is transferred to a point outside of the convex surface of the lens, and actually nearer to the ground glass of the camera than the lens. From this it will be seen that the prolongation of the camera must, in order to admit of a single component being thus employed, extend considerably farther than at first sight would be anticipated.

But what is to be done when no such distension is permissible? Although it is doubtless best to employ a single lens with its flatter or concave side to the object, it is also possible to use it when reversed. This is more particularly the case when, as in the instance before us, it happens to be a rather deep meniscus, for the components of lenses of the rapid rectilinear type are invariably menisci. If, therefore, instead of removing and laying aside the front lens of such a combination, we treat the back one in that way and leave the front lens itself in the mount, we shall find that not only do we get an image the same size as when the back lens was used, and that we get good bright definition on the plate with a moderate stop, but we also obtain these advantages with a distension of the camera less by several inches than when the back element of the combination is employed situated at the rear end of the mount. The precise amount we gain, or, in other words, the amount practically added to the extension of the camera, equals the entire length of the brass mount of the lens, in addition to the small portion intervening between the outer surface of each lens and the optical centre, which, as we have pointed out, is in such a case located outside of the convex surface. A camera, therefore, which would not expand nearly sufficient to permit of the employment of a single component of the combination when the back lens is in question, may frequently be utilised with entire satisfaction when the front lens, still remaining in its place, is used.

We know very well that a lens, when worked in this position, with the stop behind it, will not cover a large field so flatly as when in a reversed position; but, when employed, as it must be, with a stop, it will cover with considerable brightness and sharpness a field at least as large as that covered by the combination, even when well stopped down.

Of late we have employed this system to its full extent. Two of our cameras, one of them a 10×8 and the other a $6\frac{1}{2} \times 4\frac{1}{4}$, possess a distending range which, while considerably in excess of that required for the combination lenses usually employed, yet fall short of what is requisite when the single half of any of them is employed in the old way. But by adopting the method now suggested—and it applies to both of the cameras in question—an enlarged view, the objects being double the size of what can be obtained by the combination, is now got with the greatest ease, and with from half an inch to an inch of camera distension to spare.

We need scarcely point out that many of the two compounds forming the lenses of the rectilinear and symmetrical are not absolutely indentical one with another, the back lens being frequently shorter in focus than the front. In this case it only remains for the photographer to select the particular combination of that focus which coincides approximately with the length of the camera draw.

FACTORS IN EXPOSURE.

Mr. Howard Farmer's communication to the London and Provincial Photographic Association, on *Some Prime Factors in Exposing*, appears, from the tenor of our report (see page 413), to have been marked by considerably more information of a nature likely to be of service to the inexperienced photographer in an admittedly difficult branch of his subject than most dissertations upon exposure with which from time to time we are made acquainted. Suggestive as well as practical, his examination of the numerous factors which have to be considered in the exposure of a plate should serve as a useful auxiliary to those who need reminding of the many causes which directly influence that important operation. There is an oft-quoted remark of Captain Abney to the effect that development is an art and a science combined; but, if this is meant to favour the

belief that the successful treatment of the developable photographic impression is attended by difficulties which only assiduous study and practice can surmount, we incline to think that the dictum is more applicable to exposure than to development.

Starting with the proposition that the correct exposure of a plate under normal circumstances is to be ascertained by calculations which take cognisance of the factors involved, several modern inventors have produced actinometrical instruments and exposure tables of undoubted ingenuity which it is claimed will, by proper use and application, relieve a photographer of the difficulty of arriving at the duration of his exposures entirely unassisted. In these mechanical and other devices, however, by no means all the factors involved are always given play, and they are thus open to considerable theoretical, if not practical, objection on those grounds. Besides the light, the aperture of the lens, and the rapidity of the plate, subject, colour, and distance also claim entrance into the calculations, although they are not always included; and since, so far as we are aware, no accurate rule is available for estimating the values of light and colour, to say nothing of subject and distance, in relation to lens apertures and plate sensitiveness, all mechanical aids to exposure must of necessity exist under the disadvantage of comparative imperfection.

This, of course, excludes the faculty of judgment from the calculation; but the quality of judgment in photographic matters varies immensely with the individual, and in no respect more so than in the case of the exposure of the plate. We have noticed, indeed, that in the employment of mechanical aids to exposure the photographers most successful are usually those whose accuracy of judgment has been confirmed by long experience in the art of unassisted exposure. Again, there have been to our knowledge instances of exposure by meter and exposure by judgment being made, and, all other things equalised, with the results that the exposure by judgment was correct, and exposure by meter plus the requisite judgment markedly incorrect.

The *raison-d'être* of mechanical aids to exposure, if invisible to experienced and finished photographers, is, nevertheless, obvious enough. They are designed to remove from the path of the beginner the difficulty of arriving at the correct exposure of his plate. Their success in bringing about the attainment of such a result depends to an almost total extent upon the skill of the individual in putting them to practical use; but, as we have already pointed out, the majority of the factors are not constants, and, besides, are not accurately determinable on emergency, so that the sources of error other than those referable to the variability of the personal equation are not to be overlooked. The speed of the plate and the power of the light may be ascertained strictly according to rule, a given aperture of lens employed, and a certain duration of exposure indicated. But the influence of distance and colour of subject, as well as atmospheric perspective, that we wrote of a few weeks ago, and momentary variations in the power of the light, are of necessity left to the photographer himself to determine, and, if he be immature or inexperienced, it is hardly necessary for us to point out that the opportunities for error and false judgment are ample. Indeed, we are not sure that in the majority of cases the probabilities of errors of judgment are so great that the accuracy of the constant factors is more likely than not to be effaced, and thus the superiority of mechanical aids to exposure over the unassisted judgment is not sustained.

In classifying methods of exposure in vogue under several heads, Mr. Farmer seemed to think that, where the exposure was simply judged by experience, no method could be better if the experience was sufficient. At the same time he remarked that, for a young beginner or the student, the method was practically useless. So much the worse for the beginner or the student. The indefinable quality in a clever photographer which enables him to judge of his exposures with such accuracy that, as we are aware is the custom of many, he never makes a second exposure on a subject, may conceivably be acquired by rule; but, having regard to the necessary inconstancy of some of the factors, we are sceptical on the point. The modern fever for reducing certain branches of photography down to the level of mere mechanics is an unhealthy one, as it substitutes the cut-and-dried determinations of the arithmetician and the calculator for the deeper and more lasting wisdom of experience.

Experience indeed seems about the last thing in the world which many consider to be essential to the training of the modern photographer; hence exposure meters and tables. But, in times when such things did not exist, experience was the only path to success in exposure and other branches of photography, and on the whole neither we nor the old race of photographers themselves have any cause to lament that there was then no royal road to correct exposure. Photographers—and amateurs at that—were content to learn by their failures; nowadays the chances of failure are intended to be reduced to the minimum for them. It is possibly a very unscientific thing to advise a young photographer to acquire a knowledge of exposure by the appearance of the image on the ground glass added to a studious adherence to a suitable brand of plates and a standard developer; but we are almost tempted to do so when we reflect upon the many skilled photographers, professional and amateurs, who have acquired that knowledge by no other means, and who at the present moment are doing irreproachable work on the same rule-of-thumb basis.

Without denying that exposure metres and tables are in certain respects useful, we cannot but think that the acquirement of experience in the old-fashioned way, even though it takes a year or two, is more likely to impart to a beginner a knowledge, judgment, and mastery of exposure, which will enable him to work with a high degree of accuracy and certainty, than even a theoretically and practically perfect actinometer would do. The former may be difficult to obtain, the latter is nearly impossible; and, were it not so, it would not diminish our belief that, after all, the cumulative lessons to be learned from the growth of success out of failure are of considerable educational value to the young photographer. Remembering to what a large degree the qualitative character of the negative relies upon the exposure, no pains, it seems to me, should be too great to exert in studying this branch of photography, and to that end no system, in our opinion, is superior to that of trial and error, which, though it may be tedious, is never uninstructive.

ESTIMATING CHLORIDES.

Scarcely a year passes by without our having to chronicle some new method of recognising or estimating the halogens when associated in a mixture. Many of them are too intricate for the unskilled chemist, others may be undertaken with care by the comparatively inexpert. Some time ago a method for determining iodine in presence of chlorine or bromine, having

for its underlying principle the slight solubility of the yellow colour of thallous iodide, was given by Herren Hübner, Spezia, and Frerichs. It was partly gravimetric and partly volumetric, and was too involved for ordinary photographic experiment; but Herren Jannasch and Aschoff have proposed a new method of separation, which would lend itself readily to photographic investigations where, for example, it was desired to ascertain the amount of chloride present in a particular dry plate. The method proposed for separating iodine and chlorine is by means of thallium sulphate, which gives an absolutely insoluble precipitate of thallous iodide in cold water containing alcohol, even in presence of ammonia and other compounds in which thallium chloride remains in solution. Unfortunately, however, the bromide cannot be separated at the same time, as the thallous bromide is soluble.

Last Year's Sunshine.—According to the report of the Astronomer Royal at the *Annual Visitation of the Greenwich Observatory*, the amount of sunshine recorded by the Campbell-Stokes Recorder, and after rectification, was 1222 hours, which is about sixty-six hours below the average of the preceding fourteen years. The actual time the sun was above the horizon was 4454 hours. It is thus seen that we had twenty-seven per cent. of possible sunlight, or between five and six per cent. below the average.

The Convention.—We have received the complete prospectus of the forthcoming Convention at Edinburgh. It is issued in the form of a small pamphlet, and gives a list of members of the Council, of the Local Committee, with details of excursions to various places of interest, and a mass of general information, which will be of considerable service to those attending the meetings. In addition to the foregoing the tariffs of the principal Edinburgh hotels are given, as well as a synopsis of the formal proceedings of the Convention during the week commencing July 11.

Coloured Lantern Pictures.—Methods by which blue lantern slides may be produced have recently been published, but surely the carbon process would be the simplest way of all. We well remember some brilliant blue lantern slides being shown on the screen at one of the lantern exhibitions of the old South London Photographic Society, many years ago, if we remember rightly, by Mr. Foxlee. Now, by the carbon process, transparencies may be produced in almost every conceivable colour, and that by the simplest means. If a demand existed for coloured "carbon" tissues, a supply would doubtless be forthcoming. The colour of any carbon transparency can be greatly modified by toning or dyeing it, as we have explained on former occasions.

A New Antiseptic.—As we cannot be supposed to have arrived at the production of a perfect antiseptic harmless to photographs, it is worth noting that a new aspirant for honours in this direction has made its appearance. Formaldehyd is stated to possess remarkable properties of sterilisation, which practically amounts to the same thing as being antiseptic. It is so powerful in its effects that it is stated that when so readily putrescible a compound as urine is treated with it no putrefaction can take place. In some of the preparations used in bacteriological research its effect is more powerful even than corrosive sublimate, one of the best antiseptics known, but objectionable on account of its toxic properties, and quite inapplicable to photographic purposes on account of its chemical action.

Photographing near Foreign Forts.—Photographic tourists have before now subjected themselves to considerable inconvenience through erecting their cameras in proximity to Continental fortifications (although the latter have not been visible from the spot), not knowing that they were doing wrong. The term "near" is a very elastic one with some over-zealous officials abroad; but it cannot be surmised that, when stretched to its utmost, it can exceed a mile or two. Now, it often happens that some excellent views might be obtained from this forbidden ground, and made more interesting on account of the interdiction. How about the new tele-photographic lens? With this instrument and the clear atmosphere of the Continent, distance becomes ignored. Reversing a well-known phrase, it may be said, "Yet so far, still so near."

Difficulties in Making the Great Star Map.—The attempts to secure the required uniformity of stellar magnitudes on the photographic plates by the employment of the metallic gauze screens of one definite mesh were unsuccessful. Much time was consumed (at Oxford University Observatory) in the experimental research into the action of such screens on the photographic image, and in the course of the inquiry certain unexpected and interesting results came to light, the substance of which was communicated by Professor Pritchard to the Paris Academy, and which were subsequently published in the proceedings of that body. The result has been the production (and the distribution by the Paris Academy) of photographic catalogues of stars of the ninth and eleventh magnitudes within small specified areas for the use of the eighteen observatories engaged in the international chart of the heavens.

Munich Fine Arts Exhibition.—A few weeks back we alluded to this international Exhibition as being likely to prove a great success. It is now open, and is a very fine one. There are upwards of three thousand frames. The pictures are from almost all parts of the world, though we are given to understand Great Britain, numerically, is not well represented. This may possibly be, in a measure, accounted for by the fact that the Royal Academy has a greater attraction for British artists than a foreign Exhibition. Some photographs are shown, but it appears they are copies of architectural designs, &c. The illustrated catalogue, a copy of which is now before us, is well got up. It contains about a hundred and fifty illustrations of the more important works, including statuary. The majority of the illustrations are from half-tone process blocks, which serve well to show the present state of this branch of photo-mechanical work in Germany, when applied commercially. We are told that the catalogue, like most others, for that matter, had to be got up in a hurry. It is a marvellous two marks' worth. Those visiting South Germany this summer should make a point of seeing this Exhibition.

A New Permanent Incandescent Lamp.—One of the drawbacks to the use of incandescent electric lights is the ultimate loss of light, owing to the gradual covering of the inside of the globe with a fine coating of black, derived from the slow conveyance of particles of the carbon filament to the surface of the glass. According to an article in the *Electrical World*, a new method of exhausting the bulbs has been devised, and is now in use, which quite prevents the occurrence of this blackening. The usual way of exhausting the globe, which, as our readers are aware, is a necessary part of the manufacture, is by means of a mercury pump. With the new pump, which was finally made a success on May 9, 1890, mercury is not used. It makes a more perfect vacuum than the mercurial pump, and does the work more quickly. The pump in use by the *Beacon Vacuum Pump and Electrical Company* can exhaust 600 lamps at one time, while the other cannot make as good a vacuum in five hours on six lamps. Furthermore, the residuum or vapour of mercury in a globe exhausted with mercury is injurious to the filament. It will likewise blacken the interior walls of the globe as before mentioned. With the new pump a remainder of vapour of oil or hydro-carbon is left, and it will decompose in about twenty-five hours, leaving a perfect vacuum behind. Hence the lamp will not blacken, as the small particles of carbon from the filament will have no carrying medium to convey them to the glass.

Restoration of Faded Prints.—A great deal of thought and experiment have from time to time been expended on the attempt to render silver prints permanent; to what effect, in practice, alas! we know but too well. However desirable it is to secure stability in the photographs of the future, it is equally so to be able to restore those that have faded; or, at least, those of departed friends, or such pictures as cannot be taken again. Little experiment seems to have been made in this direction, or, if made, the results have not been published. The material that once formed the image, it must be assumed, still exists in the paper, though in an altered state, as it has not yet been proved to be volatile. All that is wanted is a method for restoring this to its original condition. The question is, What? It has often been stated that a faded silver print can be restored by treatment with bichloride of mercury. This is a fallacy. By the treatment the sickly yellow tint is removed, and the print becomes brighter, but no detail that has actually disappeared is restored. Still, in many instances, the picture is considerably improved in general appearance. *Apropos* of this subject, many of the pictures "restored" with the bichloride have an unpleasant red tone. This may, however, be avoided by employing a much weaker solution, and allowing longer time for its action. A solution containing from a quarter to half a grain of the salt to the ounce of water with several hours' immersion is better than a stronger one and a shorter treatment.

Photography and the General Election.—"It is an ill wind that blows no one good," says an old proverb. A General Election always brings with it a stagnation of trade, except in some few businesses, and amongst these is, or ought to be, photography. During the last one or two Elections, some of the candidates for parliamentary honours have made it a feature to send their portraits with their canvassing cards, and in some instances, it is said, with good effect. Now, the forthcoming Election ought to bring a good line to a large number of portraitists, especially to those in the provinces who are enterprising enough to secure the advantage of supplying the electors with portraits of the candidates. Of course, the local photographers would be the only ones who would obtain the commissions, as it would only act adversely to the would-be member to have the orders executed out of the district. The question will arise to many as to how the orders are to be executed, as, after they are given, the work is usually wanted in a very short time, insufficient to permit of silver printing. Amongst the mechanical processes available, we have collotype, Woodburytype, and process blocks, all of which are good for the purpose. There is yet another process which is often overlooked where rapidity of production is necessary, we allude to bromide paper. With this and a single negative it is possible to produce several thousand prints within twenty-four hours, as there is no mould to make, or plate to prepare, before printing can be commenced. What can be accomplished with this method has been fully exemplified in the illustrations in our ALMANAC during the last few years. As we have just said, the Election ought to stir up business with many portraitists.

CHLORIDE PRINTING-OUT PAPERS—COLLODION AND GELATINE.

IN consequence of the increasing popularity of the newer kinds of printing-out papers, and in spite of the fact that there are numerous brands on the market of the highest excellence, there is still a tendency on the part of many, both amateur and professional, to prepare their own, the operations involved being far simpler and more easily carried out than in the case of the more sensitive emulsions used for negative or enlarging purposes.

There have been published in your columns and elsewhere many formulæ, accompanied by the necessary hints and instructions, for the preparation of both collodio and gelatino-chloride emulsions and papers; but, notwithstanding the very full information already given, there still remain apparently some difficulties which many of the would-be workers have failed to master, and I propose therefore, in the present article, to endeavour briefly to smooth over some of those which have been brought to my notice. It is not my intention to give any definite formulæ—at least, in the course of the present article, as my remarks will, I think, enable any reader to easily adapt those already published to the slightly modified conditions of working which we shall describe.

I will deal first of all with collodio-chloride emulsion, as being the older preparation and the one which will be found generally easier of application by the amateur, whether for paper positives, transparencies, or opals, for all of which it is equally well adapted. The chief difficulties found in connexion with this form of emulsion are the structural character of the film it gives usually, the strong tendency of the sensitive film to leave its support, and, finally, the short period the average emulsion will keep in working order. These, one and all, depend mainly upon the same causes, and in removing one we are fortunately able to greatly mitigate, if not altogether to eliminate, the others.

The first difficulty, that of structure or inequality of the film, is more especially felt when the emulsion is used upon glass or opal, and is due, as you pointed out, in an article published some months back, almost entirely to the employment of an unsuitable sample of pyroxyline, combined with the acid nature of the emulsion. These causes combined to produce that quality of film known to old collodion-workers as "horniness," a condition in which the film itself is extremely tough and contractile, and, owing to the indifferent fluent properties of the emulsion, generally presents a series of crape-like ridges, which are extremely unsightly, especially in the case of transparencies. The same horny or contractile quality is, further, the cause of the second difficulty, that of the film leaving its support; the collodion itself has very little inclination in the first place to attach itself firmly to any kind of support, and under the action of water exhibits such a powerful tendency to curl or pucker, that the invariable result is a final separation.

Then, again, the want of keeping properties in the emulsion is not due to decomposition of the silver compounds, but a gradual curdling or clotting together of the solid constituents which eventually separate and leave the solvents perfectly clear. This result is not attained all at once, but the defect passes through various stages, in which the emulsion becomes more and more gelatinous, and less inclined to flow over the support, until it at last becomes entirely useless. Here, again, the fault lies almost wholly with the pyroxyline, and the usually acid character of the emulsion, though it may, and probably is, in many cases, intensified by the employment of unsuitable salts in sensitising.

The methods or formulæ ordinarily given for the preparation of the collodio-chloride emulsion consist in the formation of a chlorised collodion, chloride of calcium being usually recommended on account of its easy solubility. To this a large excess of silver nitrate is added over and above what is required to neutralise the soluble chloride, and finally a considerable proportion, often as much as three or four grains to the ounce, of citric acid for the purpose of forming the organic silver compound that is necessary to give vigour to the image, and also with the idea of making the emulsion keep. The conditions, in fact, considered desirable in order to form a good emulsion are chloride, together with citrate of silver and an excess of silver nitrate and of citric acid. The desired result, so far as quality of image, is certainly arrived at by the method indicated, but it is at the expense of the other good properties of the preparation.

In the first place, the employment of chloride of calcium is to be avoided, as, especially in the presence of citric acid, it not only forms a useless precipitate of calcium citrate, but it acts powerfully on the pyroxyline, destroying its solubility. The excess of citric acid behaves in the same way, this acid, more perhaps than any other, exhibiting that particular action. Besides this, it does *not* form citrate of silver in the real sense of the term, as is usually supposed, the whole of the silver not converted into chloride remaining in a soluble state, or nearly so. If a quantity of silver nitrate, such as would be used in the emulsion, be dissolved in water and a corresponding proportion of citric acid added, a perfectly clear solution is formed, containing possibly citrate of silver, but held in solution by the free nitric acid as well as by its own slight solubility in water. If the same additions be made to plain collodion, the result will be a slightly opalescent emulsion, which *sets* upon glass perfectly clear and

transparent, and when *dried* shows a crop of minute crystals just as a similar quantity of silver nitrate would do. This shows that in the formula referred to the citrate of silver cannot be present in its most useful form, but acts merely as so much free silver, while the whole of the large excess of acid is at liberty to exert its most baneful influence.

Next, with regard to the supposed necessity of free silver nitrate and of acid, I have proved by careful experiment that this is much exaggerated, if, indeed, such excess may not be wholly dispensed with. I have, in fact, proved by actual trial that an emulsion containing no free silver nitrate, or so little that it is practically absent, will give a rich, vigorous image, and behave in every way as well as, if not better, than one containing the regulation excess; and, further, that it may be rendered alkaline without destroying its good qualities, or bringing about the decomposition of the silver salts. The action of the alkali, however, upon the collodion soon destroys its power of suspending the silver chloride, and thus renders the emulsion useless; but the experiment shows that at least a large excess of acid is unnecessary in order to make the emulsion keep.

Now, if we take an emulsion prepared according to the usual formula, only for the sake of simplicity substituting chloride of ammonium for the calcium salt, and keep it until it reaches the extremely viscid stage and refuses to flow over the glass, the addition of a few drops of alcohol containing ten per cent. of aqueous ammonia, followed by a vigorous shake, will quickly restore its fluent properties; and, if the alkali be cautiously added so as to leave a very faint trace of acid still in excess, the emulsion will be found to have entirely regained its original good qualities, and will show no further tendency to thicken or clot together. When poured upon glass too, it will in all probability show a denser or less transparent film, though in this respect citro-chloride emulsions are always much thinner than those of bromide.

In this experiment we have taken up the free acid by means of the alkali, and thrown down the citrate of silver as an actual precipitate. If the ammonia were added to a mixture of plain collodion with silver nitrate and citric acid without any silver chloride, the difference would be that the film when set would be opalescent instead of transparent, owing to the citrate being in the emulsified instead of the dissolved state; and in that condition it would only seem reasonable to suppose that it would perform its duty more effectually.

Again, if the quantity of silver nitrate used in sensitising be reduced to just the theoretical proportion required to form the chloride and citrate without leaving any excess, it will be found that little or no difference is made in the vigour of the resulting image, though its colour, and possibly its gradations, will be considerably modified. These, however, are easily readjusted by varying the proportion of citrate and chlorine of silver, the experiment showing that the excess of silver nitrate is needless. With that removed, we lose one of the greatest enemies to the keeping quality of the paper or film, if not of the emulsion itself, for it stands to reason that the more free silver nitrate there is present, in contact either with the pyroxyline in the emulsion or film or with the paper support, the sooner a spontaneous decomposition is likely to show itself. The citrate of silver in combination with the chloride suffices to give the requisite vigour of image, while it is sufficiently soluble in the aqueous portion of the solvents to impart that richness of colour which it is one of the functions of the free nitrate to supply, while it is not sufficiently soluble to exert the injurious influence of the latter.

As for the practical application of the foregoing remarks to existing formulæ, the process is very simple, especially to such as are able to calculate out the various chemical equivalents, although even this is by no means absolutely necessary, as we shall show. In the selection of pyroxyline no special care is needful so long as an ordinarily good photographic sample is employed; but much of that in the market at the present day is fit only for enamelling purposes, or for making surgical collodion, and it is hardly requisite to say that my remarks do not apply to remedying the defects of such samples.

Let the collodion be made of moderate consistency, neither too thick nor too thin, bearing in mind that a thin collodion gives always a more even and structureless film than a thicker one, and that for use on paper all the vigour and richness that can be required will be given by a comparatively thin emulsion, though for transparencies one of greater density may be desirable. Let the solvents be of as high grade as possible—that is, as free from water as can be obtained—because this is a condition that, more than anything else, operates upon the fluency of the emulsion and the character of the film. The larger the proportion of water the less easily will the emulsion flow, and the greater will be the tendency to "crapiness" and structural markings. As it is absolutely necessary to add a certain quantity of water in sensitising the emulsion, the importance of starting as free as possible will be recognised.

In selecting the salts, avoid those whose bases form insoluble citrates or other salts, as these are liable to combine with and act upon the collodion, causing partial or general insolubility. Perhaps nothing excels ammonium chloride, which, with the assistance of a minute quantity of water, is easily got into solution in the alcohol if triturated in a small mortar. Next, instead of employing citric acid in the free state, use it in the form of an alkaline citrate, the potassium salt being best for the purpose, as being the most stable. The chemically qualified reader may analyse the original formula, and, if possible, calculate the theoretical quantity of citrate to use; but it is scarcely worth the trouble, as the emulsion made in the ordinary way is an extremely indefinite compound. The better plan will be to make a trial by converting definite proportions of silver nitrate into chloride and citrate respectively, and, if the first be not satisfactory, to vary the proportions until the desired result is attained. Two parts of chloride to one of citrate of silver will form a useful base to start from. The citrate of potash may be dissolved and added to the collodion simultaneously with the soluble chloride.

The next question is that of acidification, and here I have only to say that, though it is not absolutely necessary for the keeping of the emulsion, it may, nay, undoubtedly is, useful in preserving the whiteness of paper after coating with the emulsion. But, in place of citric acid, I recommend the use of acetic, in the proportion of, say, a quarter of a minim to the ounce of emulsion. It may be conveniently added in the form of an alcholic solution of definite strength.

As regards sensitising, let the quantity of silver nitrate be such as to barely neutralise the chloride and citrate employed, bearing in mind that the citrate of silver formed acts the part of "free" silver. The nitrate is added to the collodion in the usual manner in alcoholic solution, formed by dissolving the crystals in half their weight of water, by heating in a test tube, and then adding a small quantity of alcohol, and again heating to ebullition. When formed into the collodion, and well shaken, the emulsion is complete.

Prepared in this manner, the emulsion will require to be kept a little longer before use in order to bring it into its best form; but, that stage reached, it will be found a far more permanent preparation than those hitherto in use, and to be free from the special faults we have already noticed. It is probable that the proportions of the various ingredients will have to be considerably modified in order to secure certain favourite colours of the image, though, after all, the original colour makes very little, if any, difference in the toned print.

A final hint may be given in connexion with collodio-chloride. A difficulty is experienced by many in coating paper, the usual plan being to pin it down on to a light board; but this generally involves a lot of trouble in covering corners and edges. Nothing is easier and more effective for small sizes, and it seems equally available for large than the following plan, heterodox as it may seem: Thoroughly wet the paper, and, when at full stretch, squeegee it on to a sheet of glass. Then, having carefully surface-dried it with a soft linen cloth, coat in the ordinary way, and, contrary to what might be supposed, the film will be as structureless and adhere as well as, or even better, than if coated dry.

W. B. Bolton.

(To be concluded.)

AMERICAN NOTES AND NEWS.

American Visitors to the Convention.—We have recently had the pleasure of a visit from Dr. Charles L. Mitchell, of Philadelphia, who must be known to many of our readers by his contributions to American photographic literature. Dr. Mitchell is to

read a paper before the Convention on the *Use of the Colour Screen in Landscape Photography.*

"Linen Bromides."—We read that linen sensitised with gelatino-bromide of silver for printing purposes has just been placed on the market by an American house. The advantage of fabric printing by development over the platinum and chloride of silver printing-out processes is not apparent, and we should be inclined to doubt its practical success.

Litmus Paper.—A note in the *St. Louis and Canadian Photographer* states that blue litmus paper is prepared from a seaweed, the common rocella, which is found in all tropical seas, but particularly and abundantly in the Mediterranean. It is a lichen which grows on the rocks in the water and near the shore. The litmus is prepared by macerating the plant in water with lime, potash, and other materials, and leaving it for weeks until fermentation ensues. When it ferments it first turns red, and then blue, and when the whole mass is of the proper blue colour it is pressed into a mould and made into small rectangular cakes, which have the look of indigo and the smell of violets. To make the litmus paper, an infusion of the litmus is made with boiling water, and unsized paper is soaked in it, being afterwards dried.

Storage of Albumenised Paper.—Mr. A. W. Clark says that "albumen paper, kept even for a short time in a close, warm room, will become so dry and horny that, although it may appear to take the silver properly, it is not in the proper condition for producing the best prints, even should no ill effects show until the toning is reached. Here trouble will make its appearance, and the toning is arrested, or, at least, but poorly accomplished. The paper requires only little damping, but requires time, according to its dryness, to absorb the proper amount of moisture." Mr. Clark believes that albumen paper still holds the fort, and is destined to do so for some years to come, and he has recently come across several failures in printing which he has traced to the albumenised paper having been kept in too dry a state before sensitising.

Toning and Fixing Gelatino-Chloride Paper.—Mr. Louis Bradfisch, an experienced manufacturer and user of aristotype papers, is convinced, in *Wilson's Photographic Magazine*, that the proper manipulation of these papers is by separate toning and fixing. After washing, he recommends a toning bath of gold chloride, soda acetate, and soda bicarbonate, and, when toning is complete, a combined hardening and fixing bath, which should be freshly prepared every day, and consists of forty minims of acid sulphite of soda solution (? strength), and two ounces of powdered alum in twenty ounces of water, to which two ounces of hypo are finally added. On immersion in this bath, the prints turn yellow, but assume the proper tone in from five to ten minutes.

Do Plates Increase in Sensitiveness by Keeping?—In an American contemporary, Dr. Vogel quotes Herr Wolf, the Heidelberg astronomer, in support of the theory that gelatine plates increase in sensitiveness by keeping. Herr Wolf says particular care is necessary with fresh plates. When formerly he received plates from the manufacturer he always observed that the new plates were not as sensitive as the previous ones, and that he had to expose much longer than before, so that it almost appeared as if the plate-manufacturer was turning out inferior goods. Last winter new plates of ——, with even three times the exposure, hardly showed the objects on the negative, which were distinctly visible on plates received in a previous shipment. He could not obtain, for instance, with three hours' exposure, those stars and nebulæ which previously he had photographed with the greatest facility in one hour. It was, he says, known to him before that plates change their sensitiveness somewhat, but that they would increase to three times their original sensitiveness he could not expect. The same plates which, in the beginning, had so little sensitiveness became as sensitive after five months as the previous ones, and surpassed all his other plates in sensitiveness. The orthochromatic plates seem to be less subject to this change of sensitiveness. According to Dr. Vogel's opinion, the gelatine here plays an important part. Lately he had to examine quite a number of different kinds of gelatine. Ordinarily they give emulsions of high sensitiveness only if ammonia is applied after cooking. He found only one kind of gelatine which, by cooking alone, gave just as sensitive emulsions as with ammonia.

Photography at the World's Fair.—The following petition to the Ways and Means Committee of the Columbian Exposition is being extensively signed on behalf of the American Photographic Societies:—"Having learned that it is the decision of your Committee, and that of the Executive Committee of the World's Columbian Exposition, that the granting of special permits to amateur photographers and others for the privilege of photographing in the Exposition grounds is to be refused, because they will interfere with concessions to be held by three or four professional concerns, we, the representatives of the photographic clubs and societies of the United States, do most urgently petition you to reconsider your decision; first, in behalf of the thousands of amateurs and others who will wish to exercise the right to photograph; second, because their work will make a far more valuable and complete record of the Exposition than is possible by the few to whom it is proposed to grant the privilege; third, because it is probable a larger revenue can be derived by the issuing of special permits to the estimated hundred or two hundred thousand photographers who will certainly visit the Exposition (at the rate of five dollars for a limited period of one week, aggregating very nearly half a million dollars), than will be realised by restricting the privilege to a few for a specified amount (which is likely not to be much above one hundred thousand dollars), while at the same time greater general benefit will accrue to all concerned. We hold that, as the camera is now so universally used by the public, and as the Exposition is a public enterprise, conducted by the United States for the public benefit and education, it is unjust to the public to restrict the photographic privilege as is now contemplated, when the same revenue can be effected by methods which will confer pleasure and instruction to an immense number, and with less friction. We earnestly request that the interests of the amateur photographers be especially recognised, because of the increased revenue they may bring to the Exposition, on the plan outlined, and on account of the great value of the work they will create. We further request that special facilities for photographic work be provided for the amateur on the Exposition grounds, from which an additional revenue can be derived above that previously mentioned." There is so much that is reasonable in the prayer of this petition that we hope the Committee will see fit to grant it; not only in the interests of American amateur photography, but also because we are certain a large number of the visitors from this side of the Atlantic will be accompanied by a camera, the use of which being interdicted must undoubtedly damage the Exhibition.

PHOTOGRAPHY AMONG THE LIBERAL ARTS AT CHICAGO.

In the regulations for the forthcoming (1893) Chicago Exhibition, we are told that "All the photographic exhibits, however, will be placed together in the portion of the Liberal Arts and Manufactures building allotted to the British Section." In spite of our having been recently told that photography is not art, it may yet be of some interest to inquire the meaning of the words Liberal Arts, seeing that it is in their company we are destined to find our photographs at Chicago. (Some may here lament that "adversity makes us acquainted with strange bedfellows.") Parker tells us that "the term Liberal Art is more venerable and famous than the term Fine Art." It is at least some comfort, then, that our companions have antiquity on their side! [For a note upon the term Fine Art the reader may refer to the BRITISH JOURNAL OF PHOTOGRAPHY, May 22, 1891, pages 323–4.]

It would seem that the name Liberal Art was, in its early usage, applied to a pursuit followed by one of free birth and cultivated taste, but subsequently its application became narrowed. The history of the term (according to Parker) seems to be somewhat as follows:—

1. The learned Roman, Varro (B.C. 116–28), is said to have written 490 books, a very large majority of which are lost, among them being

one called the *Nine Disciplines*, which seems to have been "an encyclopædia of science."

2. At some undetermined part of the fourth century one Martianus Capella wrote a philosophical romance, entitled, *The Nuptials of Mercury with Philology, the daughter of Phroneris*, in which the seven arts, grammar, dialectics, rhetoric, geometry, arithmetic, astronomy, music, appear as seven bridesmaids.

It is extremely probable that this was founded upon Varro's *Nine Disciplines*, the two missing members being architecture and medicine, the reason of their expurgation probably being because they tended towards the useful rather than the ornamental.

3. This composition of Capella's, who seems to have been a pagan, was apparently revised by Cassiodorus (A.D. 486–570). It seems that it was this Cassiodorus who again drew attention to these seven studies, and dubbed them "Liberal Arts;" but by that term he intended them to be regarded as sciences, and roughly defines them as those arts which are contained in books.

4. Johnson (*Idler*, No. 91) says, "There is, I think, not one of the liberal arts which may not be completely learned in the English language. He that searches after mathematical knowledge may busy himself among his own countrymen, and will find one or other able to instruct him in every part of those abstruse sciences." Thus, roughly speaking, the value of the term Liberal Art has not materially changed from the time of Cassiodorus to the present day.

It is here interesting to note that the early usage of the term has been evenly preserved in the Universities of Cambridge and Oxford, where the Bachelor, or Master of Arts, is supposed to have shown some proficiency in the liberal arts. There is reason to suppose that in the earlier days of these Universities music held a more prominent position than it now does. In both Universities, during the present century, there has been a marked movement towards placing the fine arts of music and painting (sculpture, &c.), in a more prominent position. The Slade Professors are growing in general appreciation.

In connexion with our twin term, Science and Art, it is interesting also to note that the earlier usage of *scientia*, *i.e.*, science, was practically restricted to theology. Many moderns have usurped this term, and would entirely dethrone the ancient sovereign.

Glancing back at the progenitors of the present-day liberal arts we may, without any violence of assumption, fairly well take stock of the legitimate descendants. From the first three bridesmaids of Capella are descended the ever-spreading family of the classics, including philosophy, philology, oratory (in law and politics), and kindred branches. From the next-mentioned three are derived mathematics generally, and its attendant younger branches, viz., the exact sciences, physics, chemistry, &c.; so that, corresponding to the present-day fine arts, music alone is represented, unless poetry may be smuggled in under the cloak of classics, and architecture, under the patronage of mechanics.*

Turning once again to the universities, it will not be difficult to see that the modern representative of music is more akin to this theory, *i.e.*, scientific side rather than to the artistic practice.

This is, *mutatis mutandis*, equally true of the usual instruction imparted by the Slade Professor of Fine Art, although of late years some encouragement has been given to the practice of music and painting, &c.

The conclusion of the matter, then, seems to show that the modern descendants of the ancient liberal or polite arts are what are now usually known as sciences rather than arts.

Now, as to what constitutes the precise difference between a science and an art is not easy to formulate in definite terms. Photography has been, and often is, termed an art-science, thereby implying that it partakes of the nature of both, without belonging exclusively to the one or the other.

This term has provided an ample target for the feeble shafts of the Piccadilly pundits. But, despite their superior information, it may well be questioned as to whether or not every art is at bottom the undeveloped embryonic form of a science.

It may, I trust, be taken for granted that science is knowledge, but it does not necessarily follow that all knowledge is science. A homely illustration may make this clear. The savage knows that he can "make fire" with flint and steel, or by friction of two bits of dry wood. He knows that certain plants, seeds, &c., will grow in certain places and not in others; that certain herbs, &c., may be used for foods, medicines, &c. But he does not bother his brain with theories of energy, friction, combustion, chemistry of soils, botany, physiology. Removed from his native surroundings, he is at a loss to know how to find substitutes. New experience has to be gathered. Induction and deduction are practically non-existent for him. Cultured man, however, has accumulated facts, experiments, observations. These he continues to arrange and rearrange with a view to grouping and connecting cause and effect, &c.

When this is done, his results have a permanent and systematic value. The under-current of knowledge connecting cause and effect is then dignified by the name of science. Scientific knowledge, then, may be broadly defined as that which may be formulated in logical sequence.

One curious and interesting point may here be noticed, viz., that, in the early days of the use of this term, it seems to have been especially, if not exclusively, applied to theology, whereas, in our own day, there are not a few who would deny this branch of knowledge having any claim to be called a science.

Turning to the *Encyclopædia Britannica*, we find an article (above the well-known signature "S. C."), from which may be gleaned Johnson's definition of art as "the power of doing something which is not taught by nature." This is found too narrow, and is amplified into the following: "Every regulated operation or dexterity by which organized beings pursue ends which they know beforehand, together with the rules and results of every such operation and dexterity."

The *Imperial Dictionary* (1851) divides arts into (1) the *useful*, or mechanic, . . . and (2) "the liberal, or polite; or, as they are now more frequently termed, the fine arts are generally understood to comprehend those productions of human genius and skill which are more or less addressed to the sentiment of taste or to the imagination—as painting, sculpture, architecture, engraving, drawing, and music."

The *Encyclopædia Americana* (1883) does not appear to contain any article under the heading Art. It is quite possible that the use of the term Liberal Arts at the present day in America is but another of the many cases where they, with a true conservative spirit, retain a meaning which we, ever fond of change, have sought to express by the newer term Fine Arts.

At any rate, it will be a matter of interest to many intending English exhibitors to know what are included or implied by the term Liberal Arts and Manufactures as used in the prospectus.*

The time seems not far distant when men will cease attempting to draw fine lines of distinction between science and art, and will recognise that no such sharp lines exist. On the contrary, the artist will cease to look upon the scientist as his natural enemy, and will hail him as useful helper and sometimes fruitful suggester.

In fact, there seem to be many points of analogy between the relationship of faith and reason on the one hand, and art and science on the other. In the former case, faith is not contrary to, but beyond, reason, and begins where reason ceases to carry us. In the latter, art is not contrary to science—*i.e.*, formal statement of truth—but, in turn, transcends and records flights of emotion and perception which, in our present state of knowledge, are only felt, but are not capable of experimental or logical analysis.

Science and reason appeal to the intellectual faculties, enabling us to say, "I know;" faith and art appeal to the emotional powers, and prompt us to say, "I feel."

F. C. Lambert.

JOTTINGS.

The development of partly printed proofs on gelatino-chloride paper, of which mention has occasionally been made of late, reminds me that many years ago—I think it was in 1855—the late M. Claudet published a formula for a simple process for exposing to daylight for a very short time, and then developing the weak image so produced. The process, if I remember aright, consisted of floating paper on a solution of mercuric chloride, and, when the paper was dry, sensitising on silver nitrate. The paper was exposed for two or three seconds in summer and up to about a minute in winter, the feeble image being fully brought out by means of an aqueous solution of iron proto-sulphate and glacial acetic acid. After washing, the developed print was fixed in hypo, a deep black image being obtained. I think at the time the paper was called the Instantaneous Positive Paper.

"Talbot Archer," the English correspondent of *Anthony's Bulletin* says "that the event of the month has been the opening of the first

* It may interest us to remember that, during the middle ages, the seven arts were commonly grouped into the *Trivium*, i.e., grammar, logic, rhetoric, and quadrivium, *i.e.*, arithmetic, geometry, astronomy, and music.

* The foregoing was written some two or three weeks before the writer heard Mr. H. P. Robinson's clever paper recently read at the Camera Club Conference. The reader may be referred to the concluding portion of Mr. Robinson's paper as touching upon the matter in question.

free public exhibition of survey photographs" at Birmingham. He informs his American readers that the "work has been taken up by some eight or ten other societies, but in a desultory and disconnected way, and, with the object of binding together for this grand work all the 300 photographic societies of the British Isles, Mr. W. Jerome Harrison read a paper on the subject in London before the Photographic Society of Great Britain on May 10th. Mr. Harrison urged that the 'parent society' (as the Photographic Society of Great Britain is still fondly called), should take upon itself the direction and organization of this grand work—a National Photographic Record and Survey. Such a task will be commenced, and must be completed;" but "Talbot Archer" fears "that the Photographic Society of Great Britain is in too 'fossilised' a state to furnish the men, the energy, and the funds which are needed to inaugurate this great movement." As "Talbot Archer" and Mr. W. Jerome Harrison are tolerably well known to be one and the same person, it would be interesting to be told whether the Photographic Society of Great Britain was discovered to be "in too fossilised a state to furnish the men, the energy, and the funds," before the reading of the paper or after? If the former, why was the paper wasted on such a Society? if the latter, what has the Society since done to merit such a criticism from one who was glad to avail himself of the opportunity to read a paper before its members so recently as May 10? If the Sociey has fossilised since May 10, the process must indeed have been a rapid one; and how is it that nobody but Mr. Harrison—or "Talbot Archer"—haa heard of that unfortunate change for the worse?

But, not content with smiting the Photographic Society of Great Britain because, I presume, that Society did not receive his photographic survey scheme with the enthusiasm which that "grand work" merits in the eyes of its originator, "Talbot Archer"—or Mr. W. Jerome Harrison—thus proceeds to employ *Anthony's Bulletin* as a vehicle for the following attack on the Photographic Convention of the United Kingdom: "The annual meeting of the Photographic Convention of the United Kingdom is this year to be held at Edinburgh, in the week commencing July 11. It is curious to notice the mistaken ideas which have prevailed on either side of the Atlantic with regard to the annual gathering or 'Convention' of photographers held in each country. *We* (I judge from the references in the English photographic press) regard your Convention as a wonderful success; and yet any one who reads between the lines of the American journals can see that it is a consistent failure, relieved by spasmodic efforts at success. But, if your Convention is a failure, what must be said of our dismal imitation? A meeting is announced at some interesting spot—Chester, Bath, &c. The expectations of the inhabitants are aroused, and they roll up in their tens on the opening day, headed by the Mayor, in his robe and chain of office. To them there appears some score, or perhaps even thirty, of photographers from London and other 'furrin parts,' consisting of the usual incapables who have hitherto 'bossed the show.' Excursions are made (always in heavy rain), and papers read before audiences of from fifty (on the opening night, when refreshments are provided free) to five at the finish." What a grotesque and prejudiced distortion of the facts!

This amiable critic of the Convention proceeds: 'This year there is some hope of better things, for the new heads of the Convention (Davison as President and Cembrano as Secretary) are a long way ahead in business powers and in popularity over their predecessors. Perhaps they may be able to persuade as many as fifty English photographers to follow them to Edinburgh, but I doubt it." Your American friends may like to know that the "usual incapables who have hitherto bossed the show" include, as Presidents, Mr. J. Traill Taylor, Mr. Andrew Pringle, Mr. Charles H. Bothamley, and Mr. William Bedford, with Mr. J. J. Briginshaw as Secretary, and a Council numbering such names as Cowan, Haddon, Lang, Mason, Sayce, Webster, Wellington, Bridge, H. M. Hastings, R. Keene, A. M. Levy, Henry Sturmey, John Stuart, of Glasgow, with many others who are recognised as men of sound practical ability, and who are identified with much that is best and most successful in modern English photography, as well as up to the year 1888, Mr. W. Jerome Harrison himself! The remainder of "Talbot Archer's" attack is based upon personal motives. I see that the forthcoming Convention will be attended by several distinguished American photographers, who, I have no doubt, will take back a different impression of its importance and proceedings than that which this biassed critic has attempted to create in advance.

I read that at a meeting of a Society—which, upon my word, sir, I hesitate to name for fear some unreasonable young member may take advantage of your benevolent pages to call me all sorts of names for daring to criticise his friends' remarks—and *apropos* of the subject of halation, "films were considered more rapid than plates." Upon what evidence? Surely not upon any theory that the nature of the support exercises some sensitising influence upon the emulsion? If that is meant, where are the proofs? COSMOS.

FUSED NITRATE OF SILVER.

NOTICING the correspondence that has ensued since my statement *re* fusing nitrate of silver, it occurred to me that it might perhaps be as well to add a few further remarks in the hope that they may be of assistance to those desirous of experimenting in this direction. Mr. Whitfield's suggestion that "fusing nitrate of silver renders it alkaline and forms a proportion of nitrite, thereby rendering it a more sensitive compound than before fusing," is partly correct, as the result depends upon certain conditions, and this increase of sensitiveness, as I have already pointed out, holds good both in collodion and gelatine, although it by no means follows that the action should be the same in both cases—in fact, many substances differ greatly in their action in the two mediums.

Thinking that probably the nitrite formed was the cause of the extra sensitiveness, I tried the addition of the nitrites of silver and soda to gelatine emulsion, but did not like the working of this, it being uncertain and prone to fog, owing perhaps to the instability of the nitrites. As regards the fusing, I found that to obtain the best results each different sample of nitrate required to be treated on its own merits, for, unless some samples were fused sufficiently, very little benefit was derived, whilst the same amount of fusing with other samples would develop decided fogging tendencies; and I think this admits of explanation from the fact that the first large crystals formed during the ordinary commercial process of manufacturing nitrate of silver are decidedly purer, or free from impurities, than the crystals obtained by evaporating the whole of the mother liquid; in the first case, simple dissolving in pure water and re-crystallisation would be all that was required for most practical purposes, but in the latter case it would certainly be an improvement to fuse.

To those who care to take the trouble I would suggest that, if they have an ordinary pure commercial sample, they fuse at a temperature of about 430° Fahrenheit; this will fuse the nitrate without forming any appreciable quantity of nitrite, and yet drive off most of the impurities. The lid should not be put upon the evaporating dish, and the melted mass should be gently stirred with a glass rod, as probably the action with nitrate is similar to that with metallic silver, which absorbs oxygen from the air whilst in a state of fusion and gives it off again when cold. Should the sample of nitrate operated on be an impure one, it may be necessary to apply greater heat. Perhaps as good a test as regards impurities in the ordinary way is the amount of scum that forms during the fusing; if this scum cannot be got rid of by continuing the fusing at the heat recommended, the temperature should be raised until it is dissipated, when nitrate will almost certainly be formed, and it is as well in this case to dissolve, when cold and set, in pure water, and then re-crystallise. It must not only be borne in mind that as the temperature is increased the nitrate is decomposed and nitrite formed, but also that, if the temperature be still further increased, the silver itself may ultimately be deposited in metallic form upon the bottom of the evaporating dish. J. BARKER.

OLD SILVER PRINTS.

I.

THE recent exhibition of old silver prints by the Photographic Society of Great Britain should point a moral with respect to the permanency of pictures made by this method. It is a mere truism to say that there must be a rule for the production of anything, if it can be repeated. The rule may be difficult to carry out or even, perhaps, to comprehend. Still, the rule exists, and it should not be ou[illegible]ing

the skill of modern photographers to understand and take advantage of. Where there are a great number of conditions, and the neglect of any one being sufficient to negative the advantages gained by scrupulous attention to all the rest, it only goes to prove how much more care is necessary to secure a properly prepared silver print than is usually accorded to it. From considerable experience, and in observing how many photographers go to work in this department of their profession, the fact that a very large proportion of silver prints are fugitive is no matter of surprise whatever—if they did not fade it would be the more astonishing; and that the reason they do so—the root of the matter, so to say—should have escaped the observation of so many is hard to understand. I attribute it chiefly to a blind following of a certain routine, and ignorance by the majority of *why* such a routine has been adopted, frequently added to an utter indifference to the work.

Formerly the printing department was deputed to boys and understrappers, who knew little, and cared less, about anything else than carrying out a certain sequence of processes. If the prints looked bright, clean, and of good colour when finished, that was the sum total of all they cared for, or all that was expected of them.

It was a long time before it dawned on the greater mass of photographers that printing operations required more intelligent looking after. Investigations were set on foot, many papers were written, discussions held, and the outcome of it was that, mainly, insufficient washing after fixing, and consequently the imperfect removal of the hyposulphite of soda from the prints was the principal, if not the only, cause of fading. Scores of washing machines were constructed, and the importance of the opinion was deemed so great that but few photographers neglected to avail themselves of the best means at their disposal for thoroughly eliminating the hypo from the paper. So far good; thorough washing is undoubtedly an excellent thing, but only one of the excellent things necessary to preserve the work, and those who look upon it as all in all lean as upon a broken reed. Prints that have stood the test of three or four decades without change are, in all probability, far from innocent of contamination with hyposulphite of soda. It would be instructive to get some of the best, and test them for the presence of this chemical. The probability is that it would be found in most, as, formerly, washing was a very perfunctory operation, and the supposed necessity for the thorough removal of the hypo was not thought of, and, if the prints were entirely deprived of it, it was more a matter of chance than deliberate intention. Notwithstanding this, many scores of pictures have remained bright and unaltered to the present time. The toning and fixing was one operation, but the bath was strong in hyposulphite, and the immersion long, too. The paper, also, was less highly glossed than we have it at the present time. The negatives were stronger, and the printing much longer about, with the result that the image was impressed right into the body of the paper, which had absorbed more of a very much stronger silver solution than is used at the present day. All these differences, no doubt, tended to make a more robust image than we are accustomed to see. At the same time, it would not wholly account for the freshness and good preservation of the half-tone that many of the photographs shown at the exhibition possessed; some other reason must be found for this, which I believe to be in the more effectual fixing they received.

The stronger silver bath and more heavily salted paper charged the print with a much greater amount of silver salts that required removing than now, in this respect the old prints were at a disadvantage; but the length of time and stronger bath used to fix and tone was equal to the work, and, although we might probably find hyposulphite of soda, I do not think we should find more than the faintest traces of silver, if any, in the whites of these pictures. There were also prints that evidently had been prepared from negatives of moderate density, that, as far as scale of tone goes, would compare favourably with our modern work. This narrowed the investigation to the fixing and washing, if we say nothing about the amount of albumen on the paper, which has undoubtedly some influence in the matter, but not sufficient to account for the rapid deterioration of the work of to-day unless supplemented by something very much more important, and this I quite believe to be inadequate fixing to which the majority of prints receive, and also, to go back to first causes, the poor, thin negatives used.

When the subject of permanency is discussed, the conditions for producing this very desirable quality are generally looked upon as uncertain—an opinion apparently justified by the results; however, it seems to me, if *known* conditions were *rigidly* adhered to, the uncertainty would vanish; but, unfortunately, they are not by a long way. At one time or another I have made many experiments in this matter, which have invariably pointed in one direction—that [illegible] and effective fixation, is an *absolute necessity*, and is not such [illegible] as it is generally considered, the fact of just putting the prints out of the wash water into the hypo bath, moving them about for a stated time, and followed by a good washing, being the whole, but most ineffective, procedure. Let us examine the method in detail. In the first place, the print as it comes from the toning abounds in silver salts more or less soluble, the greater part of which it is necessary to remove, seventy-five per cent. at any rate, the solubility being governed in part by the thickness and permeability of the vehicle containing them, usually albumen. Some, of course, are in the substance of the paper itself, but the aim has been to keep the image on the surface much as possible, and with many of the papers now in the market this aim has been successfully carried out. The photographer is very much in the dark as to the paper and its preparation, and has no means of gaining any information on the subject. It, no doubt, varies with every maker and albumeniser, but is sufficiently alike to answer its purpose with the same treatment. Hyposulphite of soda is the agent universally employed to fix the prints. It goes without saying, it should be a good sample.

EDWARD DUNMORE.

PICTORIAL SELECTION IN PHOTOGRAPHY.*

LIGHT AND SHADE.

We will next see what influence "light and shade," or "*chiaro-oscuro*," has upon pictorial effect. The words "*chiaro-oscuro*" are commonly translated "light and shade." Some writers prefer "clear obscure," or "light obscure." The term is used in reference to the lights and shadows of a picture, as also to its tones of colour.

In contemplating an extensive landscape it may have been noted that on the objects and forms nearest to the eye, the most brilliant lights and the deepest shadows are seen; and that, as the distance from the eye increases, these lights and shadows gradually diminish in intensity until they are ultimately lost, blending together in a kind of greyish-blue tint. Not only is it found that lights and shades lose their intensity in proportion to their nearness or remoteness from the spectator, but, as a necessary consequence, the contrasts also are less prominent, and the outlines less distinct, the more the distance is increased.

It may be as well here to state that there is a distinction between shade and shadows, the former being used in reference to those portions of opaque bodies which are removed from direct light, and the latter the deprivation of direct light suffered by another body, occasioned by the opacity of an object which intercepts it. That it is necessary to make this distinction is obvious, from the fact that in nature there is invariably found a difference in the intensity of these two kinds of shade, the shadow being almost always darker than the shade on the adjoining body by which the shadow is cast. This can be easily seen by taking a white object, say, a cube, and placing it on a sheet of white paper in a strong light, when it will be seen the portion of the cube in shade will be lighter than the shadow it casts. This difference is occasioned by reflected light; but it is unnecessary for me to do more than just refer to it, or detain you further on the matter.

It is the intention of a good picture to tell its story distinctly and intelligibly, avoiding all things which disturb the attention. This, without a good knowledge of *chiaro-oscuro*, cannot be done, for, unless the artist strictly adheres to the leading principles of this department of art, his labour will be thrown away. His first endeavour must be to obtain unity of light and shade by so massing his lights on the chief point of the picture that the eye may dwell on it with undisturbed satisfaction. To scatter over a picture at regular intervals a variety of objects having an equal degree of light is to produce a result more nearly approaching the nature of a chess-board, where the alternating spaces of black and white, so equal in size and power, allow the eye to wander over its surface finding not a single point of interest on which it can repose. The quantity of dark shade given in paintings is about one quarter; another quarter is allowed for light, and the remainder for middle tint. In many excellent pictures we see the greatest part occupied by middle tint, with very little positive light or dark, and in others we find a preponderance of light, with just a little "strengthening" or "darkening" of a part to create a focus for the whole. Generally in this latter composition small spots of colour, or strong contrasts, are introduced with telling effect, as is often to be noticed in some of Turner's charming works, in which a group of figures, a boat, or even a few broken posts, give extreme brilliancy to the picture.

As we are dealing with the camera now, it will be unnecessary for me to enter into the various methods adopted by artists in the treatment of

* Concluded from page 392.

chiaro-oscuro, because it is obvious the photographer's art is limited to the extent that he is only able to reproduce the subject as it appears before his lens, after a careful selection of his position, &c., and the due consideration of its most suitable lighting, whereas an artist has greater scope in introducing certain effects, which may enhance the beauty of the composition, although not actually present in the particular subject before him. This would be considered under the head of "invention," which need not trouble us here.

Supposing you have chosen your position, you will note how the objects in the foreground tell, the proportions of the strongest contrasts, the amount of brightest light and deepest shade in proportion to the remaining middle tint. See the shade and shadow is not in excess, so as to produce a dark and heavy result, and that the light does not preponderate, for an exactly opposite reason whereby a weak and insipid picture will be obtained. Do not hesitate to alter your position if these do not quite satisfy you, as no success is gained without labour, and a good negative is worth a little trouble. It will require some amount of practice to nicely determine the "values" of distant prospects, as in photography colour is reduced to black and white, with intermediate tones; but for near scenes, picturesque bits, old houses, &c., this difficulty is soon overcome when it is remembered what depth of tone certain colours produce.

Although unity of light must always be sought after, it must not be carried to too great an extreme, as repose will almost be lost by the eye being continually recalled to this isolated point (Fig. 9). In order that

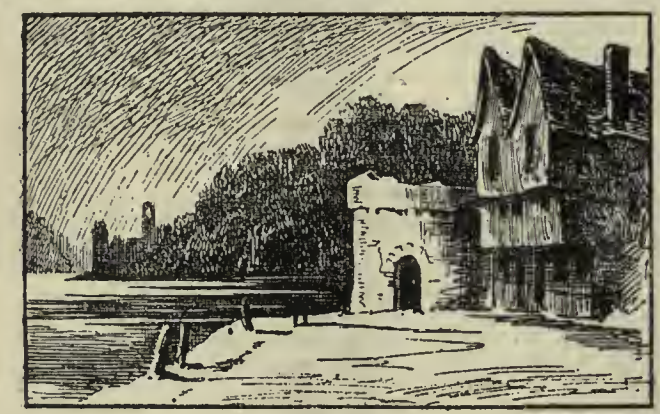


Fig. 9.

this singleness may be prevented, it is advisable that other groups of light should be admitted (Fig. 10).

These must be varied in their form, size, and degrees of power, and the breadth of the shadows so well preserved, that they may serve as places of repose to the eye, separating the groups from each other, that is, there should be *one* single portion having the most brilliant light—and consequently possessing the greatest contrast in the opposite depth of

Fig. 10.

shade—to which should be added other groups of light of a less degree of intensity, whereby both unity and repose will be secured.

The term "repose" is applied to those parts of a picture, either in deep shadow or middle tint, where lights and shades are so subdued that the eye can rest upon them without fatigue, after the excitation produced by the brilliancy and effects of the principal parts.

However objects may be scattered throughout the picture, they must be so grouped and collected together that, although each object has its own particular light and shade, the lights of all should generally mass together, as well as the shades, which will give a unity of effect always to be commended (Fig. 11). Cast shadows will be found of great assistance in

Fig. 11.

securing this quality of unity, inasmuch as, by passing from one object to another, they connect and hold them together (Fig. 12).

Seeing that shadows are more prolonged when the sun is low, it will be well to make exposures, when possible, either in the morning or afternoon rather than exactly at noon. As, in speaking of composition, it

Fig. 12.

was suggested that lines receding from the foreground were to be preferred, so, in the matter of shadows, parallel lines should be avoided.

Interest in Objects in Light.

It is important to observe that when any object is placed in light it is essential it should either possess some interest in itself or in its accessories in order that it may have that degree of interest which alone can allow the eye to rest upon it with satisfaction. Without such care it will appear bald and uncouth, and present an uninteresting and defective appearance. Thus, if you are about to select a rustic cottage with whitewashed walls, see that the portions in light have a few picturesque cracks between the stones, or across the plaster, are partly hidden by a creeper,

or an apple-tree close by. Perhaps a nail may be found on which to hang a bird-cage basket, some garden implements, a sieve, or article of wearing apparel. If a fisherman's abode, nets, crab-pots, oars and spars may be requisitioned, and failing all these, it will possibly afford a suitable position to place a figure, care being taken in selection of colour of dress in reference to contrast. If the ugliness cannot be overcome by any of these means it will be best to reject it altogether, or defer its portraiture until a more fitting time, when it may be seen in shade, and, in consequence, be less conspicuous.

To recapitulate, we have noticed the most brilliant lights and shades are in the foreground, gradually losing their intensity as distance increases, that there is a distinction between shade and shadow, the latter being the darker of the two, the intention of a good picture to tell its own story, which is impossible without good arrangement of light and shade, the great importance of unity in this matter to the getting rid of scattered light, various proportions of light and shade in compositions, the desirability of having more than a single spot of light and the proportionate intensity and variation in size of those added, the gathering together of scattered objects, the assistance of cast shadows, and the necessity of having interest in the portion in light.

To determine the most suitable manner in which we may introduce our figures, and to find the most appropriate position to place them in, must be our next endeavour.

Figures, &c.

There are but few scenes in nature, however beautiful they may be, upon which the eye can rest with continued pleasure unless they exhibit some signs of animated life; consequently, few landscapes are complete without the introduction of figures or animals, which shall enlist our sympathies on behalf of the scene presented to us, and, moreover, furnish us with a scale by which we may judge of the extent of the view and the size of every other object it may contain.

Who does not know how greatly a wild stretch of mountain and moor is enhanced by the presence of deer, shaggy cattle, or horned sheep? and, supposing it to represent a spot even too dreary to afford sustenance for these, how welcome is the dark form of a cormorant rising with heavy beat from a peat-stained tarn, whose waters, chafed by the flapping wings, break into silver ripples along its course to the opposite shore! Or, to take a pastoral scene, who will deny the increased interest manifested in the contemplation of an old timber waggon with its team of horses and rustic attendants, whose demeanour, perhaps, suggesting some slight incident, no matter how trivial in itself, not only gives to the whole an air of reality and truthfulness, but lends an additional charm to the prospect presented.

Views which consist in a large measure of water, be it river, lake, or sea, find their proper embellishments in ships' barges and fishing craft of all conditions of shape and size, and of every possible description.

It is very essential in choosing an object or figure to remember it should be "in keeping" with the rest of the picture. Thus, in a village scene consisting of thatched cottages, with trees, a tiny brook, and distant country beyond, it would be highly injudicious to introduce an individual whose chief attributes consist of a stove-pipe hat, with coat and trousers of the latest West-end cut and design, to say nothing of "spats" upon his feet, and a stick and glass complete, very proper, no doubt, to his mind, for Piccadilly, but utterly unfit for the purpose we require. Rather let us look about for one whose clothes bespeak honest labour, which have long since lost the creases they once possessed in the shopman's windows, having, in part, become moulded to the form which lives beneath them.

Another point I should like you to consider is the "pose" of your figures. It must be admitted that, in many cases, there is a lack of grace in country-side folk and a certain amount of crudeness, or angularity, call it what you like, about their natural attitudes. Perhaps no one better than a painter knows the great difficulty there is in overcoming this unfortunate effect, the most trying part of which is, that, the more you endeavour to get your models into a pleasing attitude, the more rigid and angular they become. They have the knowledge they are being "took," and, as they generally hold views diametrically opposed to those of the artist on such matters, a pleasing result is only obtained after much tribulation. This is, however, most to be remarked in persons of middle life and onwards, as children of both sexes and those in the hey-day of youth generally pose themselves in very pleasing attitudes, quite befitting their country life and occupation.

Whilst it should be your aim to place your figures in such a manner as shall present agreeable lines in your composition, be *very careful* you avoid the other extreme in giving them a species of classic pose more suggestive of Junos or Dianas than the simple folk of a country village, remembering you had better a thousand times have angular and even somewhat ugly forms in your pictures than that such a result should obtain.

These remarks apply to rustic scenes and general landscape views, and, inasmuch as a West-end fop would be "out of keeping" in proximity to thatched roofs and whitewashed walls, so would a ploughboy in a like degree be out of place in a London-drawing room, however much you might wish to emphasise contrast. Always see, then, that your figures are suited to the situation you intend them to occupy, and endeavour to place them in as natural and easy a posture as possible.

Now, as to where they should be introduced in your compositions. This will entirely depend on the subject you select, and what you determine shall be your strong point. If you decide that an object in the landscape shall first arrest attention, the figures will then have to hold a secondary position; but, if there is nothing of any particular interest in your view, let the figures be made of more importance. They will generally be found useful as a "balance" in the composition, or as a "contrast," the irregularity of their outlines being opposed to the lines and angles of buildings, as also their apparel, to the darker tones of vegetation, or *vice versâ*.

Another point you should consider is, whether you intend to make a "figure subject" or a "landscape with figures," as on this depends the size of the figures, or the space they should occupy. Avoid having them of such a size as would leave any doubt in the mind of the observer which was the more important part of the picture, the figures or the landscape. If the former, the prospect beyond should be broad and effective in its masses; if the latter, then the figures should be just sufficient to serve as a scale, and give additional interest to the whole.

In "grouping" care should be taken that no two groups are of the same size, nor placed in opposite positions. Always endeavour to have one group larger than any others, both as regards number and the space it occupies. Generally, groups should diminish in the space they occupy as they recede from the eye. If the light admits, try and connect them by means of the shadows they cast; sometimes a dog will be found very useful to this end. In placing your models avoid formality, aiming rather at irregularity in their outlines. You do not want a regiment of soldiers; hence never arrange them in line, have some portion of the group higher at one point or another, not forgetting that nets or farming implements carried on the shoulder will materially assist you in this direction. If you have a preponderance of vertical lines in your composition, let the figures pose in such a way as shall cut them obliquely; should horizontal lines be in excess, connect them with those of perpendicular tendency (Figs. 13 and 14).

Fig. 13.

The "relief" which figures afford in your pictures must receive some consideration; and, perhaps, in no instance will it be more necessary to remember what tones certain colours take when reduced to black and white. If this is overlooked, it will be found, after much care and trouble have been expended on their arrangement, you will get no effect, owing to the colours of the apparel worn by your figures being so near in tone to whatever may form their background.

If your background is light, you will have greater "breadth," if the tones of the dresses produce a light middle tint. If contrast is required, you will have recourse to pronounced tone; but, supposing you have a street view in some village, the brightest light being on the side of a house or wall, it is by no means necessary you should straightway select that spot as the most suitable to place your figures wearing the darkest clothes, unless you desire to rivet the attention of the observer on that particular point. It is impossible, in the infinite range of subjects which will commend themselves to your notice, to say where your figures should

be placed in every instance. If you have natural taste, positions will be suggested almost at a glance, and it will only remain for you to bear in mind some of the precepts which have been enumerated, in order to

Fig. 14.

determine which is the most suitable, in keeping with the laws of composition.

To those who do not possess this precious gift, but who are anxious to produce pictures having some claim to artistic merit, I can only advise they should endeavour to master these rules—a by no means insuperable task—at the same time taking note of good work executed by others, not only in photography, but in every branch of pictorial art, and, above all things, continually going to Nature, closely studying her under her many aspects, thereby acquiring a knowledge which can never fail to interest, and which will always elevate and refine.

Let me say, in conclusion, I hope these remarks on composition may assist you in your future efforts with the camera; and, although at first sight it may appear a difficult matter to overcome, it should be remembered, so vast is the importance of its principles to the artist, that any time spent upon their acquisition will be well bestowed. Of this, however, we may all rest assured, that no portion of sound knowledge is ever gained without some corresponding amount of exertion, and equally certain is it that "excellence is never granted to man but as a reward of labour."

The following works have been referred to in the foregoing remarks:—*Theory and Practice of Landscape Painting*, by George Barnard; *Theory of Painting*, by T. H. Fielding; *Model Drawing and Perspective*, by Williams. W. D. G.

NOTES FROM NEW SOUTH WALES.

Permanence in photographic prints is one of the subjects which seem to be open to perpetual discussion and controversy. In a recent issue of the Journal I notice that Mr. George Bankart, in a paper read before the Birmingham Photographic Society, places this point of permanence in the first position in urging the merits of the carbon process.

In this climate—the northern extremity of New South Wales—we have extremes of wet and dry weather, often with great heat in both cases, and my experience of carbon pictures is that, in hot, damp weather, they are often attacked by mildew, unless extraordinary precautions are taken; while in a dry heat they are apt to crack, especially where a deep shadow is pretty sharply contrasted with a high light. In looking at some very nicely executed copies of engravings, done on opal by the carbon process, I found them cracking all over and coming away in thin ribbons from the support. This occurred chiefly where there was little or no pigment; and it appeared to me that whatever substance—glycerine, sugar, or other material—had been used to give permanent flexibility and elasticity to the carbonaceous ink had either dried out or been insufficient to prevent it from contracting and tearing off in ribbons in the manner described. When mounted upon such a material as opal or metal, unless this property can be destroyed or neutralised in the gelatine ink, I am afraid carbon pictures upon non-porous, inflexible substances cannot be declared to be permanent. By the way, examples of most of the more commonly known processes may often enough be seen out here, but platinum prints are amongst the rare pictures.

Stereoscopic pictures were, some three or four years ago, to be seen in the windows of every photographic printseller and stationer, as well as in many of the opticians' and photographers' show-cases; in fact, there was quite a craze for them; stereoscopes (chiefly the "Holmes" pattern) and pictures were the fashion. This result appeared to me to have been brought about by the enterprise and push of some Yankee agents, who permeated the city, suburbs, and the country with their instruments and a stock of slides, which they were selling together at a fairly remunerative price, so many slides and a stereoscope for so much—about 25*s.* for, say, two dozen and the instrument. Some of the slides were very good, others inferior enough, and the demand gave rise to a supply of rubbish generally copied from others, often being made from two prints from the one view (monocular pictures). Some of the best I saw were Colonial views of yacht races, street scenes, seashore views, &c.; but, upon a subsequent visit to the city some twelve months or so later, all the stereoscopic pictures were gone from the windows, the fashion was past, and instead, optical lanterns greeted one's sight everywhere. Recently, the number of places for the sale of photographic requisites has largely increased, and the prices are comparatively moderate, running at twenty-five to fifty per cent. over English quotations, according to the article. The productions of all the leading makers can be had in Sydney and Melbourne, lenses at an advance of about twenty-five per cent., cameras 40*s.* to 50*s.* on advertised prices.

Photo-mechanical processes are beginning to be used during the last few years much more extensively than formerly—or, perhaps, I would be more correct in saying photo-zincography, if that is the proper term to apply to the pictures prepared for printing along with type. The *Illustrated Sydney News* (monthly) and *The Town and Country Journal* (weekly) are much indebted to photography for their pictures; and, in a lesser degree, the *Sydney Mail* and *Bulletin* (weeklies). The process seems to be similar to Ives' or Meisenbach's; but I am bound to say that there is much left to be desired in many of the reproductions. An ink-holding grain formed of a fine, uniform mesh does not readily lend itself to the exigencies of rapid and frequent printing with common ink on inferior paper; so that it is only the better journals which show satisfactory results.

A photolithographic printing company was started in Sydney, some few years ago, with a pretty large capital; but I am afraid it was in advance of our requirements, for although some very good lithographic work was turned out, the company did not seem to be a financial success. The process was a patent one, but what was its distinctive character I do not know. Very good photo-lithographic work is turned out at the Government printing-office here; but only recently one of the principal landscape photographers in the metropolis complained through the press of the fact that many pounds' worth of views, &c., were obtained by privileged persons at this institution free of charge to the recipients, but at the expense of the taxpayers generally.

Although there are a large number of professional and amateur photographers in the colonies, the societies are not at all numerous nor "much in evidence." There appears to be one in the capital of this colony, only two in Melbourne (Victoria), two in Brisbane (Queensland), and one in each of the other colonies except New Zealand, where they are more numerous. It should be an interesting, instructive, and profitable speculation, if carried through with judgment and energy, to have an exhibition of photographs in each of the colonial capitals, at which the various prize pictures shown in Great Britain would be exhibited, along with others of great merit, and some of our best colonial pictures. I think a great deal could be learnt by both professionals and amateurs by the opportunity for inspection and comparison. We should, at any rate, be able to judge of the position held by the colonies in the art-science as compared with the mother-country. Many of the pictures should find purchasers if for sale at reasonable prices.

In the matter of portraiture, I think our best artists can hold their own with most of those which I have had an opportunity of seeing from the old country, but there has been a very extensive adoption of the "enamel" finish to portraits, especially in the country towns.

Prices vary, too, almost as much here as they seem to do with you. The "Cabinet" is the size most largely patronised, and they can be got from 10*s.* or 12*s.* per dozen (or, I think, even less) up to 2*l.* 10*s.*, the mean being about 15*s.* to 1*l.* 5*s.*, for which price very good work is given.

Occasionally a fashionable photographer in the city gets a sitting from an actress, or some other celebrity, who is temporarily "the rage," and the pictures are sold by thousands. I understand this occurred in the case of Mrs. Brown Potter, Madame Bernhardt, and one or two others. I was not fortunate enough to see the originals of two or three of these "Beauties"—a matter of regret to me, as the photographs have left me wondering what all the world went crazed over. If I accept the photographs as trustworthy portraits, I should say that America and this colony have given the two most beautiful women to the stage, and they have both abandoned it.

I am sorry to say that very few portraits now can be relied upon to any great degree. The "Retoucher" frequently remodels the picture so extensively that one often does not recognise his friends.

A. J. Simpson.

Our Editorial Table.

Adams & Co.'s Photographic Annual, 1892–3.

Prefixed by a number of practical articles on topics of photographic interest by Captain Abney, Messrs. H. P. Robinson, Andrew Pringle, W. Willis, and other writers, this well-printed and lavishly illustrated *Annual* supplies an excellent guide to the innumerable productions of Messrs. Adams. It is most complete and comprehensive, and is in its way a clear indication of the expansion of modern photography.

Eastman's Gelatino-chloride Printing Paper.

We are very glad to see that the Eastman Company has introduced a new printing-out paper, for we know that their establishment at Harrow is so perfect and well equipped as to lead us to anticipate no failure in keeping up the output of anything they now undertake.

The gelatino-chloride paper is issued in two forms, one being pure white, and the other with a delicate warm tint, this latter having a *soupçon* of roseine, although not pronounced. In surface appearance the paper is almost identical with albumenised paper, and we note its entire freedom from specks or defects. When placed under a negative in the frame, it prints with great rapidity, exceeding in this respect all the samples of ready-sensitised albumen paper we have of late had access to. It takes a good tone in the printing, and a special feature is, that it does not need to be much over-printed. Although, after printing, the subsequent operations of toning and fixing may be carried out just as usual, yet is a special formula for toning and fixing at one operation recommended. It is as follows:—

Combined Toning and Fixing Bath.

No. 1.—*Alum and Hypo Solution.*

Hyposulphite of Soda	8 ounces.
Alum	6 „
Water	64 „

When dissolved, add to above three ounces carbonate of soda, dissolved in eight ounces water. (This must be added very carefully on account of the effervescence which takes place.) Allow to stand twenty-four hours, then decant the clear liquid.

No. 2.—*Gold Solution.*

Chloride of Gold	15 grains.
Acetate of Lead (Sugar of Lead)	64 „
Water	8 ounces.

To make the toning bath:—

Take of No. 1 Solution	8 ounces.
Take of No. 2 Solution	1 ounce.

After printing, immerse *without previous washing* in the above toning bath until the desired tone is obtained.

The above solutions will keep any length of time.

When toned, transfer the prints to the washing tray, giving at least one hour and a half's thorough washing in several changes of water.

Should any other formula be used for toning, the prints, when toned, must be washed in two or three changes of water, and then fixed in a bath of hyposulphite of soda of the following strength:—

Hyposulphite of Soda	3 ounces.
Water	1 pint.

Care must be taken to keep the prints in continual motion, in all solutions.

From the trials we have made of this paper, we are greatly pleased with it, and must congratulate those concerned upon its introduction.

We have also received the catalogue of the Blackfriars Photographic Company, of Surrey-row, S.E. This is a very bulky volume, in which illustrated particulars of the principal photographic materials in general request are given, including the firm's own specialities.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
June 27	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
„ 27	Gloucestershire	
„ 27	North Middlesex	Jubilee Hall, Hornsey-road.
„ 27	Rossendale	Townsend-chambers, Rawtenstall.
„ 28	Great Britain (Technical)	50, Great Russell-st., Bloomsbury.
„ 28	Lancaster	Storey Institute, Lancaster.
„ 28	Leith Amateur	
„ 28	Warrington	Museum, Bold-street, Warrington.
„ 29	Bath	Roy. Lit. & Sc. Inst., Terrace-walks.
„ 29	Burnley	Bank Chambers, Hargreaves-street.
„ 29	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
„ 30	Halifax Photo. Club	Mechanics' Hall, Halifax.
„ 30	Hull	Royal Institution, Hull.
„ 30	Liverpool Amateur	Crescent Chambers, 3, Lord-street.
„ 30	London and Provincial	Champion Hotel, 15, Aldersgate-st.
„ 30	Oldham	The Lyceum, Union-st., Oldham.
July 1	Bristol and West of England	Rooms, 28, Berkeley-sq, Bristol.
„ 1	Cardiff	
„ 1	Croydon Microscopical	Public Hall, George-street, Croydon
„ 1	Holborn	
„ 1	Leamington	Trinity Church Room, Morton-st.
„ 1	Maidstone	"The Palace," Maidstone.
„ 1	Richmond	Greyhound Hotel, Richmond.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

June 16.—Mr. P. Everett in the chair.

Messrs. R. P. Drage and J. Weir Brown were appointed delegates to the Convention.

Some Prime Factors in Exposing.

Mr. E. Howard Farmer delivered a discourse on this subject, and said that, if it was not new or interesting, it was important educationally. In photography nowadays, as in other subjects, people were not satisfied to work by rule of thumb. For the student a knowledge of principles was of great value. A great deal of attention had been given to the production of tables and instruments, which, by mechanical means, gave the time of exposure. Such aids as the Watkins exposure meter and Messrs. Hurter & Driffield's actinograph were of great value as labour-saving implements or tools, enabling a photographer to arrive at his correct exposure without the exercise of brain energy, and anything which saved that was of value. His purpose that night was to try and show the extent to which the ground covered by these tables had already been gone over. There were four methods of ascertaining the exposure:—(1) Where the exposure was guessed; (2) where it was judged of solely by the illumination of the ground glass, a method largely used at the present time; (3) referring the subject to some other subject of the same nature taken under similar conditions; and (4) that in which the worker, so far as he knew, took into consideration every factor which regulates the exposure and allows for each of them in the particular subject he was going to expose for. The first method was like betting, it was all the odds on the exposure being wrong. As to the second, many operators simply judged by experience, and, where the operator had sufficient experience, the accuracy was surprising, but when they came to the young beginner that method was practically useless; besides, it had sources of error which were unrecognised. For instance, hardly any two pieces of ground glass gave the same brilliancy of image, and that made a difference. Again, different atmospheric conditions made a considerable difference in the brilliancy of the image, and so did moisture and grease on the ground glass. The third plan was a most excellent one, where the operator had the previous experience, and where notes of the exposures on similar subjects were kept for reference. The fourth method consisted practically in making a sort of equation in which A, B, C, &c., were the known factors, varying under different conditions, and the exposure required equalled x; and some such plan as this was necessary until sufficient experience had been obtained by the worker. All the actinometer tables and photometers were based on this method, and he proposed to show how far that method went. (*a*) An operator working in a studio rarely used his lens quicker than *f*-4 or slower than *f*-32; for outdoor work, *f*-8 or *f*-64; and for interiors *f*-16 or *f*-120; and this gave a variation for ordinary work of 1 to 60. (*b*) The sensitiveness of the film—taking Wratten's instantaneous plates, which were about 18° on Warnerke's sensitometer, as a guide—varied about 1 : 10. (*c*) Power of the light. With the altitude of the sun down to one or two degrees, the variation would be about 1 : 16; at 60° or 70°, 1 : 2; in dull weather, about 1 : 4; the extreme range thus being about 1 : 64. (*d*) The variation in the amount of light cut off by trees, in interiors, &c., was unlimited; in connexion with which he mentioned having taken the interior of a city church which required an exposure of a fortnight. He had thus assumed certain conditions, namely, the working aperture of the lens as *f*-8, the sensitiveness of the plate to be that of Wratten's instantaneous (15° Warnerke), the sun at an altitude of 30° to 40°, with a blue sky and a fairly constant light. As to (*c*), the subject, it was not nearly recognised to what an enormous degree this regulated the exposure; while in regard to distance a great difference of opinion prevailed. Supposing, then, they were standing on a hillside looking at a town in a valley three or four miles distant, with the sun shining, and, say, one or two friends in the foreground, the proper exposure (with the foregoing conditions) would be one-thirtieth of a second. Going to within 100 feet of some trees, the exposure would be increased to one-eighth of a second; quite close under the trees, it would be one second; and, very near indeed, it would be four seconds. The difference in the exposures was due to their having to expose for the shadows. The first subject was actually in sunlight, but at a distance of 100 feet there were portions not in sunlight, necessitating a longer exposure, while up to the trees there was no sun. This method was in employment at the Polytechnic. The students were sent out to take a certain subject, and give a certain ex-

posure; and, if this was found incorrect, they had to take the picture again and again. Thus they had got together a mass of evidence of the greatest value from an experimental point of view. The same remarks as to distance and the effects of lights and shade held good with regard to studio work and interiors. An easy method of illustrating the effect of distance or exposure was obtained in the case of a hedge. Being close to it, one could see into dark portions of it; but, getting further away, those dark places were not seen. The colour of objects ranging from snow to hillside grass and a dark Devonshire cliff; of white statues, groups, bronze figures; of a grey-haired man, an ordinary individual, and a Hindoo, gave considerable variations, the range being from 1 : 60.

Having briefly considered as factors the object aimed at and the size of the plate in proportion to the original, Mr. Farmer said he thought the exposure meters did not sufficiently take into consideration some of the most important factors which regulated exposure. In Messrs. Hurter & Driffield's actinograph the light, the aperture, and the sensitiveness were allowed for, but the other factors were not. But how far was it possible to give particulars for those other factors? He indicated a table of distances as the basis of exposure, such distances being taken from the camera to the nearest important shadow. Comparing the light in different parts of the world with that of England, he said he found the light of the Canadian prairies the most actinic, being twice as quick as that in England, which he accounted for by the country being very flat and the ground very light. A large proportion of the light was reflected from the ground. Diffused light was no quicker than in England. In conclusion, Mr. Farmer passed round a number of pictures in illustration of the chief points of his discourse.

Mr. A. Cowan thought that Mr. Farmer had made out a good plea for one addition to the actinograph of Messrs. Hurter & Driffield. The table of factors was not sufficiently large, although, so far as the table went, it was very correct. Mr. Farmer's four first factors must be correct.

Mr. J. R. Gotz, in reference to the lens at *f*-8 as a factor, said that the exposure would be longer for a wide-angle lens of the same focus than for a narrow angle.

Mr. A. L. Henderson considered the fortnight's exposure, to which Mr. Farmer had referred, as "incomprehensible."

Mr. J. S. Teape had used the actinograph several times, and found it very accurate as a guide, but said that, in photographing a village scene with the trees in shadow, and the sun striking over the tops of them, the actinograph indicated twenty-four seconds. He (Mr. Teape) gave a minute, and the plate was only just about correctly exposed. He thought note should be made of such cases for guidance.

Mr. J. Weir Brown, in regard to the colour of light at different times of the day, said that the relative rapidity of some plates he had recently been trying increased from 4 : 6 in the afternoon, to 1 : 6 in the evening. The light must have been of a different quality at seven o'clock than at four o'clock.

Mr. W. E. Debenham said it was desirable not to take the last numbers visible in the Warnerke sensitometer, but to take that part of the plate where the straight line in Messrs. Hurter & Driffield's curve came in. He mentioned this ten years ago to Mr. Warnerke, who agreed with him. He (Mr. Debenham) and Mr. Burton both made some experiments with regard to auxiliary exposure as affecting the sensitometer value of plates, and they found that a certain plate with auxiliary exposure could be made to register a speed sixteen times greater than without. Of course this could not be taken as a guide for exposure.

Mr. Farmer having replied to the discussion, a vote of thanks was passed to him, and the meeting terminated.

Holborn Camera Club.—June 17, Mr. J. H. Avery in the chair.—Mr. A. J. Golding gave a demonstration on *Carbon Printing*, using the tissue as sent out by the Autotype Company. This printing process was, in Mr. Golding's opinion, one of the most charming. Mr. Golding gave a number of hints during the demonstration, and developed a few prints to illustrate his remarks. On Saturday, June 18, outing to Pinner and Ruislip, where a very charming day was spent in spoiling plates.

People's Palace Photographic Club.—June 17.—"Outing" work was shown by Messrs. Cable, Walker, and S. J. Beckett. Mr. George Patten handed round some whole-plate prints from negatives taken in the Lake District; he also showed some marine views, printed on Whatman's drawing-paper, which he had himself prepared. These were much admired. Mr. Cable asked why his prints sometimes printed a blue colour and sometimes of a red-brown tint? In reply: It depended upon the amount of moisture contained in the paper. If bone-dry, it printed blue. It was thought a certain amount of atmospheric moisture was necessary for getting the best results. Mr. G. Kendall, referring to his previous experience of marbling-like stains on his plates after developing, said he had overcome that by putting the plate in water before flowing on the developer. He, however, was still unable to account for the cause of the stains.

Harlesden and Willesden Photographic Society.—The members of this Society made an excursion on Saturday last to Cassiobury Park, Watford. The occasion was a most enjoyable one, and, notwithstanding the unsettled state of the weather, some charming bits were obtained. The next meeting of the Society will take place on Tuesday, the 28th inst., at "Sunnyside," 50, Craven-park, Willesden. Intending members are invited to communicate with the Hon. Secretary (Mr. Woodbury), 23, Fairlight-avenue, Harlesden, N.W.

Richmond Camera Club.—Since the beginning of the summer session weekly meetings, chiefly of an informal character, have been held and, considering outdoor attractions, well attended. On the 10th inst. Mr. Ardaseer gave a demonstration of the process of toning with salts of platinum. The process was clearly and concisely explained, and a number of prints were toned by way of example. Club excursions have been made to Perivale, to Hayes and Keston, and to Penshurst.

Manchester Photographic Society.—June 16, the President (Mr. Abel Heywood) in the chair.—After the formal business a number of the recent developments of what may be termed modern photography were brought under review; the first was the use of films as a support for the negative. Mr. C. H. Coote gave his experience of the films used in the ordinary double backs. As regards the working he found no difficulty, and his results were in every way equal to glass negatives, the saving in weight could be judged from the fact that three dozen films did not exceed in weight three glass plates. Isochromatic photography was treated in short communications from Mr. Whitefield and Mr. Brier. Both gentlemen arrived at similar conclusions with regard to the use of the yellow screens, namely, that with ordinary plates very little was to be gained, but with isochromatic plates the results with screen were superior to those taken without. From experiments Mr. Whitefield had made, a dark screen did not over-correct the blues as compared with the yellow. Mr. Brier considered that for landscapes the isochromatic plate and screen rendered a better gradation of tone, especially in the sky, though it showed the exposure in a good light about three times. During the evening Mr. Brier explained the working of the new cold-bath platinotype paper, and demonstrated the simplicity of the process by developing about a dozen prints. One great merit of the paper was that, the development being gradual, the result was better under control. The finished prints have a very good black tone, and the detail is remarkably well rendered. Mr. Brier also contributed the following notes on the working of the new Anastigmatic Lens by Zeiss, of Jena:—"After most careful and thorough trial of the lens last winter, I was so convinced of its great superiority over all other forms of lens, that I purchased one of 5¾ inches focus for a new quarter-plate travelling outfit I was making. I have since used this lens for about 200 exposures, the results of which quite satisfy me. To put the virtues of the lens into as few words as possible, it possesses the most perfect defining powers in the centre of the field of view at full aperture of any lens I know. Secondly, being a lens of great covering power (or wide angle), and giving excellent marginal definition, with a comparatively large aperture, on a large surface, relative to the focus of the lens, it can be most successfully used for short exposures on subjects requiring such powers. I draw your attention to a few examples, in which, though only four inches by three, the lens has practically been covering a plate of twice those dimensions, and has defined well close to the margin with the large aperture of 12·5. Then, there is the freedom from astigmation, as it is called. Well, this astigmation is nothing more or less than a confusion of the pencils of light, generally getting worse as the margin of the field of view is approached, or it may be quite central on points or objects which are out of focus; but the best (or worst) way of arriving at this beautiful result (with any lens) is to focus sharp on a very near subject, leaving all distant ones to take care of themselves. Well, this Zeiss lens just gives as little confusion as possible, if properly used. I show you comparative results between it and a recently produced lens of similar focus by one of our most noted opticians. The lens is a most excellent one for enlarging with, as at full aperture it will give better definition than otherwise good lenses will when stopped down to a fourth of its rapidity; but care should be taken to keep the light out of the lens, except when necessary for focussing and exposing. I do not think this lens desirable for hand cameras, its powers of covering are not required, and it is better for being accurately focussed."

Rotherham Photographic Society.—June 14, Mr. E. I. Hubbard, M.S.A., in the chair.—Two new members were elected. The principal business was the consideration of a paper on *Stereoscopic Photography*, read by Mr. Leadbeater. He argued that stereoscopic pictures possessed a charm not to be obtained by any other means of picture-making. He had recently renewed his acquaintance with this branch, and had obtained most satisfactory results, many of which he exhibited. On Friday, the 17th, the members had an enjoyable excursion to Haddon Hall, Derbyshire. The first "outing" of the season was to Comsborough and Sprotborough on Saturday, May 28. Beautifully fine weather prevailed on both occasions.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

ORTHOCHROMATIC PHOTOGRAPHY.

To the Editor.

Sir,—We notice in the paper read by Dr. Acworth before the Photographic Society of Great Britain, of which a report appears in your last issue, many inaccuracies, some of which we must beg to correct.

Dr. Acworth mentions the name of Mr. Clayton as one of the workers in connexion with isochromatic photography. Probably no one would be more astonished at the honour thus conferred on him than the gentleman in question, who in reality had nothing to do with working out the process, his name occurring on the English specification merely because he was at that time in business partnership with the real inventor, Mr. Attout Tailfer, to whom, as stated in your columns by Colonel Waterhouse long ago, "alone is due the credit of the successful application of the colour-sensitising properties of eosine to the gelatino-bromide process."

In Dr. Acworth's incomplete description of the Tailfer process, he speaks of it as an optically sensitising process, and of the plates prepared by it as containing "an enormous quantity of dye." Any one who will read Tailfer's specification will see that this is altogether erroneous, and that the eosine, or erythrosine, is not used as a "dye," but as a chemical sensitiser, only so much of it remaining in the film as is combined with the silver bromide. The plates are not dyed at all, as Dr. Acworth supposes, and, in fact, differ very little in colour from ordinary plates, as can be seen by examining any of our isochromatic plates. The

system of "optically sensitising" by means of dyes is well known as Dr. Vogel's, and should not be confused with the Tailfer process of chemical sensitising.

With regard to Dr. Vogel's English patent, it is perhaps not generally known that this patent was never issued according to the original specification, the sealing of the British patent being successfully opposed by ourselves on the ground that it was, to all intents and purposes, a copy and infringement of Tailfer's invention; consequently, by order of the Comptroller, Dr. Vogel's principal claims were struck out, and a disclaimer inserted, the legal effect being that the process, if used at all in this country, could only be so used by licence under the Tailfer's patent; doubtless this is why the Vogel patent was allowed to lapse.

The process, however, was no improvement, and never had any commercial value, for the reason admitted by Dr. Acworth, that plates prepared by it with free silver will not keep, neither are they any more colour-sensitive than properly prepared isochromatic plates, which have the additional advantage that they are equally as permanent as ordinary plates.

Finally, in quoting M. Leon Vidal, and speaking of the isochromatic plates manufactured by the firm of Lumière, of Lyons, Dr. Acworth omits one important fact, which is, that this firm holds a licence from Attout Tailfer under his French patent.—We are, yours, &c.,

Hackney, June 21, 1892. B. J. Edwards & Co.

CORRECT EXPOSURE.

To the Editor.

Sir,—I cannot help wondering whether Mr. Michael has made any definite trials with a view of finding out the truth in this matter. If he had, I am sure that he would find that his theory of a wide-angle lens requiring less exposure than a narrow-angle one when used with the same ratio of stop under identical circumstances to be quite incorrect.

I have just made a definite experiment in the matter. One half of a 7½ × 5 plate was exposed with a seven and a half inch single Wray lens at *f*-32 for three seconds, the other half being marked. The unexposed half was then exposed on the same subject from the same standpoint with a twelve-inch single Wray lens at *f*-32 for three seconds, the two exposures being within five minutes of each other, and the light (unclouded sunshine) being unchanged. The two exposures received, of course, the same development, and I enclose the negative.

Would you, sir, kindly say whether there is any sign of inequality of exposure, which would be the case if Mr. Michael's theory were correct? The plate is an old make, and one end of the film thin. I must be excused from entering into an explanation of the fact *why* a large amount of subject reflects no more light to a square inch of the sensitive plate than a small amount does. It is a question which the opticians have not touched upon.—I am, yours, &c., Alfred Watkins.

Hereford, June 18.

[We have examined the plate sent, and cannot detect any sign of inequality in the exposure of the two images.—Ed.]

To the Editor.

Sir,—Mr. Michael does not appear to have noticed that in keeping the same ratio of aperture to focus (May 20, page 335) he has changed the area of the stop, and made exactly the allowance for which he contends. In the second case, four times the area of object, giving four times the light, is made to cover the same area of plate as in the first instance, but the stop has been reduced to a quarter of the area, and allows exactly the same amount of light to pass as before.

The exposure required is therefore equal in both cases, or, as he expresses it, "the lens works at the same intensity."—I am, yours, &c.,

Redlands, Red Hill, June 20, 1892. John Sterry.

"JUNIOR" AND "COSMOS."

To the Editor.

Sir,—"Cosmos" challenges me to point to a supposition, implied or expressed, that the London and Provincial Photographic Association was aimed at in his remarks. I refer him to the sixth paragraph of his "Jottings" in The British Journal of Photography, June 3. In the fourth paragraph he mentions the London and Provincial, and in the sixth he proceeds to elaborate his attack by gibes at the clever persons who regularly snubbed the younger and less-informed members in his days. Further on, he states that the wise members of the Society to which Mr. Haddon belongs were unable to answer a certain question, and referred it to the examiner. The whole paragraph points to the London and Provincial; but, as the attack was by *innuendo*, I denied its truth in the only manner possible, viz., "*if* applied to our Society." Were I so disposed, I might take advantage of your contributor's defective grammar in the first phrase of paragraph six, where he writes Society in the possessive singular instead of the plural.

With blushing reluctance "Cosmos" will hardly admit that "not long ago" is inconsistent with "several years ago." If "several years" means "not long," then "Cosmos" should change his *nom-de-plume* and subscribe himself Methuselah, for with him years must be as days. But—most extraordinary of coincidences!—you may remember, Mr. Editor, that at the meeting of the London and Provincial, on May 5, one of the members mentioned he had been informed by a chemist's assistant that recrystallised nitrate of silver sold by his firm was merely the large crystals picked from the ordinary stock. This is the very thing "Cosmos," eight days later, stated he had heard not long ago at a photographic society, and, to his own discredit, bore witness to the fact of such dishonest practice. I do not say "Cosmos" heard this remark at the London and Provincial. He lives 200 miles away. Besides, he is very old, and would not visit London, because he would have to travel by that abominable modern invention, a railway.—I am, yours, &c.,

June 18, 1892. Junior.

To the Editor.

Sir,—In common with many other members of the London and Provincial Photographic Association, I was somewhat at a loss to understand the onslaught on friend Haddon by "Cosmos" in your impression of the 3rd inst. I even had unkind thoughts of your correspondent and dim visions of "writing to the papers" on the subject. His letter this week, however, has disarmed me, and I now bear him no ill-will. It must be very difficult to successfully ridicule the proceedings of photographic societies when you have only the reports in the journals to guide you, and when a correspondent lives nearly two hundred miles from London, and has not attended a meeting of a photographic society there since "Junior" was in long clothes, the difficulty must be still greater.

Since "Junior" was in long clothes! Dear me! why at that time there were only two or, at most, three photographic societies in London; now we have them in almost every parish. So the young members were "snubbed" in those days, were they? How things change! Now it is the folks who *don't* go to the meetings who try to do the snubbing.

"Cosmos," I notice, commends the wisdom of "Junior" in not signing his name. It is as well to write under a *nom-de-plume* sometimes. Had "Cosmos" set a better example, perhaps "Junior" might have followed. I say *might*; but he might not then have considered it worth while to reply, or might not have cared to risk having half a page of expletives flung at him—who knows? Oh, I *am* glad I did not reply to his letter.—Yours, &c., Another Junior.

[Come, come, good friends; we put it to you whether enough and to spare has not been said on both sides of a matter which seems to have given rise to a good deal of misunderstanding all round.—Ed.]

THE ECLIPSE HAND CAMERA.

To the Editor.

Sir,—My attention having been drawn to Mr. Kinnear's letter of the 17th, I feel compelled to reply to that portion of it which is likely to mislead.

Referring to my specification of a patent, published in the Journal of the 10th for improvements in hand cameras, he says:—"This plan I had applied to my camera in March last, principally, no doubt, as a means of focussing, the want of which, except by sliding the lens in a tube, which was never satisfactory, being a serious defect in the Eclipse form of camera."

From this I assume that Mr. Kinnear does not know of the existence of my focussing flange, which enables the operator to focus with absolute precision from infinity to within five feet without in any way increasing the bulk of the camera or lens.

With regard to Mr. Kinnear's suggestion or claim of priority of invention, I am unable to comment on the addition he has to his camera, the object of which he appears somewhat in doubt; but does he suppose that a patent filed in June required no time to bring it into existence? As a matter of fact my swing-back device was made and tried as far back as January last, but was not secured owing to difficulties that had to be overcome with the sliding wings, every part being so slight.

With my design the swing obtained is so great that there is no need for raising the front, and I further obtain a greater local range than has, owing to the peculiar construction of the spring fittings, a greater focal range than has hitherto been possible on a camera of such small dimensions.

Surrounded as I am by cameras with swing backs of ancient and modern construction, it is scarcely probable that I should patent a swing arrangement with no novelty in it, as Mr. Kinnear assumes; but my object is more than attained if so good an authority as he is convinced, as he says that these improvements "will undoubtedly make this form of camera more generally useful."—I am, yours, &c., F. Shaw.

87 & 88, *Newman-street, London, W., June* 22, 1892.

Exchange Column.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

Samuel Powell, Rushden, Higham Ferrers.—*Baptist Missionaries' Group. Baptist Ministers' Group.*

George Emberson, Chertsey, Surrey.—*Portrait of John Dalma.*

A SUBSCRIBER.—Consult the information on toning in the ALMANAC.

JOSKIN.—1. We believe Messrs. Marion and other firms supply such rims. 2. "Name It" will probably suit your purpose.

L. S. D.—Gum arabic is not soluble in methylated spirit, therefore there need be little wonder that you failed to make a solution.

PICKWICK.—The paper has clearly been exposed to light before it was placed in the enlarging camera. Hence the cause of the fog.

SCOTIA.—We have not tried such a method, but see no reason why it should not answer. Better give the plan a trial, and thus prove, in practice, if it answers your requirements.

W. A. M.—The "phenomenon" you describe was brought about by your putting the plate wrong side foremost in the slide, so that the glass side was next the lens instead of the film.

ROBERT WILSON.—The quantity of pyro does not strike us as being excessive. The solution can be used for several prints. Take the solids as grains instead of parts, and the water as 2 oz. I dr.

S. H. P.—We see no objection to your making transparencies for enlarging from on the specially prepared lantern plates, instead of in carbon. If the transparencies are equally good, it matters not by what process they are made.

H. SUSMANN.—We did not take note of the date of the *Standard* in which Dr. Vogel's communication appeared. That gentleman's views of Mr. Ives' method are, we should think, sufficiently clear from his letters in our own columns.

LIVERPOOL.—The primuline process is patented, but you may obtain a licence from the patentees. If you only want to work the process as an amateur, we believe a licence is not required, provided you purchase the material of the patentees or their agents.

W. CHARLES.—At this season of the year the strength of the solution for sensitising carbon tissue should not exceed three and a half or four per cent. In winter a stronger bath is advantageous, say one ounce of the bichromate of potash to a pint of water—or five per cent.

E. B. J.—Dextrine, as we have said several times before, is not a suitable mountant for silver prints. It is a convenient material to use, it is true; but, unfortunately, it is almost invariably acid. Consequently, it should be avoided for photographic purposes, or at least so far as silver prints are concerned.

E. W. A. S.—There may be several reasons why the prints do not tone. The paper may be at fault, or the bath upon which you sensitised it may be out of order. The same remark applies to the toning bath. Make an entire change of the materials used. This will prove whether the chemicals, or the manipulations, are at fault.

W. B. says: "I have an old lens, rather large, and the following is the maker's name: Jamin, ingénieur opticien, breveté s.g.d.g., 14, rue Chapon, Paris. Could you tell me what kind of lens it may be, or if there is still a firm of that name in Paris?—It is evidently an old portrait lens. Jamin has long been succeeded by the firm of Darlot.

R. BOTHWELL complains of the returns made by a refiner for some residues sent for reduction. As our correspondent appears to have no idea as to the quantity of silver contained in the residue beyond that they weighed so much, with such data it is quite impossible to form any judgment as to whether the return was fair or not.

LUX.—1. If the negative has been intensified with uranium dissolve out the latter in a solution of sodium carbonate, and, after well washing the negative, bleach with mercury and redevelope with ferrous oxalate. If sufficient density is not then obtained, repeat the operation. 2. Probably a solution of citric acid will remove the stain.

C. WILLIAMSON asks if there is any objection to smoking in the dark room while developing—that is, will the fumes act injuriously on the plate?—So far as we know, tobacco smoke has no effect whatever. As a matter of fact, it may be safely affirmed that the majority of amateurs' negatives are developed in the presence of the "fragrant weed."

R. J. CHOLMONDELEY (Hythe).—Not knowing whether our correspondent means the retouching of cabinet heads or cabinet landscapes. If it be the former, Mr. Redmond Barrett's charge is, we understand, eighteenpence each, high-class work being assumed. If he means landscapes, he must write to Mr. Barrett, whose address is, 527, Caledonian-road, London, N.

R. BRISTOW.—Evidently you are under a misconception with reference to the "process block" portraits that sometimes appear in the illustrated periodicals. They are not all done from the original negatives, but from others made from specially worked-up portraits—often enlargements on bromide paper. In this way better results are frequently obtained than if the original were employed.

REDUCER.—1. To reduce with perchloride of iron, use it in the proportion of one drachm to six ounces of water. Bleach the plate, and, after washing, fix out the silver chloride formed with hypo. 2. One and the same.

H. WELLSMAN inquires if, when the copyright in a picture has expired, and photographs of it are published, he is at liberty to copy one of the photographs, as he cannot obtain the original picture to copy himself?—Although the copyright in the original picture has expired, there may be a copyright in the photographs of it, in which case reproducing one of them would render any one doing so liable to penalties.

NUMQUAM.—1. It depends entirely upon the effect desired and the formula used. 2. Yes; in conjunction with the preparation of the plates. 3. It is not usual to treat the plates with spirit. 4. Some workers adopt one method and some the other, according to the preparation of the films. 5. Quite a matter of taste, provided the plates are properly coated. Usually the plates are coated, and then placed in the drying box.

T. L. HART writes: "Can you give me the reason why my enamelled portraits lose their lustre after two or three weeks' standing? Some commercial enamels I have by me are almost as brilliant as when received several months ago."—The portion of print enclosed certainly has a dull surface for an "enamelled" print, but we cannot assign any reason for it, seeing that we are furnished with no particulars as to how the print was treated.

PROVINCIAL asks how professional enamellers treat the glass plates to prevent the prints sticking. He says he has tried wax and French chalk, and he cannot get on at all with the latter, but with the former he can, except that the prints have a smeary appearance from the wax, after they are taken off the glass.—There ought to be no difficulty with the chalk if it were well rubbed into the glass. The smears, when the wax is used, are due to imperfectly polishing the waxed surface. A little more care will overcome the difficulty.

J. C. HUGHES says: "I should feel extremely obliged to you if you can give me, through your correspondence column, a recipe for making a mountant for dry prints, and whether dextrine is injurious to a photographic image. 2. Messrs. Marion sell a mountant, a clear brown colour, for dry plates, which I wish to make some like."—In reply: 1. Starch is as good a mountant as can be used, whether for dry or wet prints. With regard to dextrine, see reply to another correspondent. 2. As we are unaware of the formulæ by which Messrs. Marion's mountant is made, we must refer our correspondent to that firm for its composition.

A. R. W. writes: "One of my assistants has unfortunately let one or two drops of sweet oil fall on a water-colour drawing I have undertaken to get framed. Although the oil was soaked up at once with blotting-paper, it has continued to spread in the picture. The picture is said to be a valuable one. I have tried to patch it up with water colours of the same tints, but it is repelled by the grease. Can you suggest anything to make the colour 'take'?"—If the grease be taken out no fresh colour will be needed, and this may be easily done in the following way: Take some *pure* benzol, and let one or two drops fall on the grease spots, and after it has remained a few seconds blot it off with perfectly clean blotting-paper. Repeat this treatment till the whole of the oil is removed. If the grease has penetrated deeply into the paper, it may be well to treat the back in the same manner as the front, that is, supposing the picture to be unmounted.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—June 30, Annual General Meeting. July 2, Outing to Theydon Bois. 7, *Intensification.*

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—At the Technical Meeting on Tuesday, June 28, the subject for discussion will be *Latitude of Exposure.*

WEST LONDON PHOTOGRAPHIC SOCIETY.—June 25, Weybridge. Cycling division meets at School of Arts at half past two. Tea at "Hand and Spear," Weybridge.

PHOTOGRAPHIC CLUB.—Jane 29, *Plate and Film-changing Appliances.* July 6, *The Solubility of Photographic Chemicals.* June 25, Saturday outing to Watford. Train from Euston at fifteen minutes past two; Broad-street, forty minutes past one.

THE Duke of Newcastle and Mr. Gambier Bolton, F.R.G.S., start this week from Tunbridge Wells in the Duke's caravan, the "Bohemian," for a photographic tour in Kent, Sussex, and Hampshire. With two hand cameras always ready for "shots," and the large apparatus, which both carry, close at hand, they should return loaded with good negatives. Their journeyings will doubtless be watched with great interest.

BRIGHTON AND SUSSEX NATURAL HISTORY AND PHILOSOPHICAL SOCIETY (PHOTOGRAPHIC SECTION).—The next excursion of the Photographic Section will be on Saturday, June 25, to Berwick (Alfriston). Train leaves Brighton at fifty minutes past one. The next meeting will be held on Friday, July 1, at eight p.m., in the Librarian's Room, Public Library, Church-street. Subject: *Perspective as Applied to Photography; the Use and Abuse of Wide-angle Lenses,* Mr. Bedford.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1678. Vol. XXXIX.—JULY 1, 1892.

PRESERVATION OF SILVERED MIRRORS.

The production of mirrors by the deposition of metallic silver upon the surface of glass has now been practised for nearly half a century, and has greatly conduced to advances in the arts, sciences, and manufactures. Astronomical science in particular has gained much in the popularising of telescopes of large dimensions, that may now be had at prices infinitely less than when the costly specula, along with the still more costly achromatic object glass, alone held sway.

In photography the silvered glass mirror has proved of great utility as an optically perfect reflector. It need scarcely be pointed out that when the silvering is on the back of the glass, as must necessarily be the case if the tinfoil and mercury system be employed, the reflection is altogether imperfect and inadmissible for purposes requiring accuracy, on account of there being both a primary and a secondary reflection, the one from the silvered surface, the other from that of the glass.

A true optical reflector, such as that used in front of the lens for producing a reversed negative, must be silvered on the front surface, and that must be polished into brilliance by cotton wool and rouge, according to methods well known. The silvering itself is quite an easy matter, if practised according to the directions very carefully given in several of our Almanacs of a former date.

But what we desire at this time to draw attention to is the fact, that a layer of pure silver, exposed as it is to the action of the atmosphere, is very liable to become tarnished, and sometimes with considerable rapidity, by the deleterious gases continually present, in addition to the oxidation it would undergo even if the atmosphere were quite pure. Conversing on this subject with Mr. F. E. Ives, that gentleman mentioned his employment of a varnish composed of a solution of celluloid for such silvered surfaces, which, while it was infinitesimally thin and did not practically interfere with reflection, yet was so homogeneous as not to present the slightest break in its continuity, a test he employed for this purpose being the application of ammonium sulphide, which would immediately make its presence known upon the silvered surfaces. Mr. Ives had also tried collodion for the purpose, but found that, when greatly diluted, it had a disintegrated film. We, too, had frequently tried collodion as a varnish for silver, but, from our selection of a specially tough or skinny sample, and using an excess of ether, had not found any disadvantage.

Celluloid is readily soluble in amyl acetate, and this is the solvent that must be employed for the purpose in question. It is imperative that the solution be exceedingly thin, and also that it be carefully filtered previously to its application to the mirror, which, too, must be well dusted before it is coated with the varnish. No heat must be used.

In addition to the value of such a varnish as this, when applied for the protection of the reversing mirror of the photographer, it seems, so far as we have tried it, not to interfere with the definition of a silvered telescopic mirror, and, if further trials on delicate star tests should bear out our first impression, it may prove of utility in the employment and preservation of large reflectors, which entail a certain amount of trouble in re-silvering when the metal gets worn off by the polishing necessary to keep it clean.

THICKNESS OF FILM.

The opinion expressed in the course of the discussion on latitude of exposure at the Technical Meeting of the Photographic Society of Great Britain on Tuesday night, that a thick film of gelatino-bromide of silver allows of greater latitude in the exposure is, we believe, largely if not generally held. A little reflection, indeed, will show that the penetrative power of the light is necessarily determined by the quantity of silver salt held in the film, and consequently it is easy to realise that in the case of long or abnormal exposure the high lights and what we shall call the middle lights penetrate the whole of a thin film, or one comparatively poor in silver, far more readily than a film holding a larger quantity of silver.

Perhaps this effect may be more clearly understood and appreciated by the simple experiment of holding side by side, in the sunlight for a minute or so, two plates, one with a thin film of bromide, the other with a thicker film. On examining the backs of the plates after the exposure, it will be perceived that, while the surfaces of both plates are equally as dark, the back of the thin plate is much darker than that of the thicker one. In the case of over-exposure in the camera the penetrative power of light, although its action is not visible to the eye, is somewhat analogous in its effect.

The colour of gelatine plates produced by the presence, in more or less quantities, of iodide of silver in the film, is also supposed by many to assist the film in resisting the penetration of the light, although, in point of fact, the film itself may, as regards its quantitative nature, be undoubtedly thin. This theory is plausible enough, taking into consideration the comparative insensitiveness, if not inertness, of iodide of silver. Silver iodide enters into the composition, although only minutely, of the most rapid plates, and, employed in films in which so liberal a quantity of bromide is present as to constitute an admittedly thick coating, is probably capable of assisting to allow of a material expansion in the latitude of exposure as well as of minimising the dreaded phenomenon of halation. Indeed, a thickly coated film containing a good

quantity of iodide is held by many able experimentalists to fulfil both requirements far better than many other special devices. Here, then, is a hint for those plate-makers who are anxious to meet modern requirements under those two heads.

It is singular that the plea for plates admitting of greater latitude of exposure than those now obtainable should go hand in hand with that for plates that will prevent halation. We have heard it stated that both the complaints here implied are to be traced to the abnormally thin films with which emulsion-makers are now said to coat glass and celluloid. Avoiding for the moment any consideration of this point, we may note as a fact that in the earlier gelatine dry-plate days restricted latitude of exposure and halation did not seem so commonly complained of as now. This leads to the supposition that in those times much thicker films were vouchsafed to us than now. Is that so?

UNACCUSTOMED DEVELOPERS.

It is now many years since Mr. M. Carey Lea published a series of most elaborate researches into the varying action of different developing agents, many, if indeed not most of which had been hitherto unsuspected of the possession of any developing power. Although at that time none of the numerous substances tried exhibited any real advantage over pyro or ferrous oxalate, practically the only two developers then employed, more than one of them gave promise of better things if only the proper conditions of working could be found. Although we failed to corroborate in their entirety the results obtained by Mr. Carey Lea, the reason was probably to be found in the fact that, while our repetition of his experiments was made upon gelatine films, his original researches were made, if we remember rightly, with pure silver bromide spread upon paper.

At the present day, when paper is so generally employed, and developed prints are an every-day production in every laboratory, amateur or professional, it does not seem unlikely that some of these almost-forgotten developers might be found to have their special uses, either in rendering some particular class of tones or in dealing with negatives of some peculiar quality. For instance, while the prevailing tone of developed prints is usually found to range between neutral black and various shades of grey, there is an undoubted leaning towards tones of a warmer character, either brown or red, even to the *terra-cotta* tint known as "red chalk" or Bartolozzi. Again, different brands of paper, when used with any given developer, are often found to give results varying with the character of the negative, one paper favouring thin negatives, while another gives better results with an image of considerable vigour.

Now, in Mr. Carey Lea's exhaustive description of the behaviours of the different solutions tried by him, the colour as well as the relative vigour of the developed images were the points to which he attached the greatest importance, rapidity of development, freedom from fog, or abnormal reduction, and similar characteristics being made to occupy a secondary position, as being subject to modification by very slight causes. In the development of paper positives these two points are the ones which may be said to entirely control the character of the result, hence it is that Mr. Lea's articles of upwards of a dozen years ago become well worth reference at the present time, in view of the possibility already hinted at, that they may open up fresh methods of development available in connexion with our modern processes.

Of the large number of substances of widely different character "exploited" by Mr. Lea, undoubtedly the most interesting group was that of the ferrous salts, mostly of organic acids, to which especial attention was devoted, owing to the fact that it was from that particular group that the then newly introduced ferro-oxalate developer had been evolved. In practice, however, though most of the ferrous salts were found to possess developing powers, none except the oxalate proved to be of any real use as substitutes for the methods already in use, those that were readily soluble being generally the worst in this respect, while those which necessitated the employment of some other agent, such as potassic oxalate, for their solution, were open to the suspicion that any good effect might really be due to the formation of ferrous oxalate or other salt.

Some of the salts were, however, spoken of favourably as being worthy of further investigation under different working conditions, foremost amongst these being ferrous borate, tartrate, and sulphite; while, speaking without direct reference to the articles, if we remember rightly, the citrate, which soon afterwards became a recognised developer, especially for chloride films, was passed over with comparatively slight mention.

The borate developer was mentioned as in every way the one that had most favourably impressed Mr. Lea, though, again, speaking from recollection, its finest results were obtained when used in combination with oxalate of iron. Its general characteristics were, however, vigour of development and quality of colour, and our recollection of its behaviour with gelatine films is that it gave pleasing brown tones of a "sepia" character, and entirely free from the objectionable greenish tinge so frequently associated with brown tints.

Of course it must always be borne in mind that the colour of a film or image may be entirely different when viewed by transparency, and backed up by paper respectively; and that, therefore, the colour obtained by us might not be available for positive purposes. At the same time it should be also borne in mind that the colour of the positive by reflected light, *i.e.*, a paper or opal print, is very greatly affected by the thickness of the deposit, and that, though an image dense enough to be viewed as a transparency might be wholly useless when backed up by paper, still the colour under the latter condition would be favourable if only the density were considerably reduced. For sepia tones in bromide prints the borate developer of Mr. Carey Lea, either in its entirety or in combination with ferrous oxalate, might be worthy of a further trial.

In connexion with the ferrous nitrate developer there was nothing special to mention, except that it offered the chance of a combined physical and chemical developer; or, in other words, could be used for either wet or dry plates. Its actual application in this form had not, so far as we remember, been successfully made; but its possibility was demonstrated, and, as Mr. Lea pointed out, such a combination would constitute an ideal developer. This, again, may be worthy of further attention on the part of our experimentalists.

The sulphite developer was another that was very favourably mentioned, though, if we are correct in our recollection again, it was formed by the simple admixture of sodium sulphite and ferrous oxalate in Mr. Lea's experiments, while in our own we dissolved recently precipitated oxide of iron in excess of sulphurous acid. Formed in this manner, it makes a pale-green solution, which keeps well and acts as a somewhat energetic developer, giving markedly warm tones of the "red-chalk" character, especially with collodion emulsion; and, what is of greater importance, the red image so obtained can be toned with gold in precisely the same manner as a silver print.

This solution may be with very great advantage combined with ferrous oxalate in varying proportions, according to the colour desired; indeed, it makes a most admirable renovator for spent ferrous oxalate, and such a revived solution is particularly well adapted to the development of prints.

DUST.

We have dealt with the evil effect of dust on portrait and landscape lenses, but in modern photography we have to count with microscopes, telescopes, and spectroscopes, in connexion with which also the dust evil is capable of working considerable mischief. A good photo micrograph cannot be secured unless the lenses are scrupulously clean, and especially is this so when working with the eyepiece. To ascertain whether a particle of dust, that is perceptible in the illuminated field of view, is on the objective or the eyepiece, the latter should be revolved on its axis: if the spot move, its location is the eyepiece; if it remain stationary, it must be sought in the objective. In any case, it must be removed before work commences.

We need not discuss telescopically hurtful dust, as that branch of photography is only employed in a few and those skilled hands, but a word about the spectroscope may be written. To those who use this instrument with the eye alone, few things are more annoying than to find that a spot of dust of some kind has settled upon the knife edges of the slit; far more troublesome is the presence of such a particle, as, until removed, it is the cause of a permanent streak from end to end of the spectrum—a disfigurement that would be particularly annoying when the negative was the result of labour and time. We mention it here only to name a remedy that was recently given by a well-known astronomer. Those familiar with this "matter in the wrong place" know how troublesome it is to get rid of. The remedy is a quill toothpick—one that has been rubbed with the teeth is better even than a new one.

We dismiss our consideration of the connexion between dust and apparatus by saying that in the putting away of all apparatus—lenses, portrait, landscape, microscopic, spectroscopic, and woodwork—more injury is, perhaps, done by omitting to remove dust than by all other causes together. Where the possessions of a photographer are one lens and one camera, or a score, the most scrupulous care should be taken each day they are employed to see that they are put away perfectly free from dust. Many hundreds even of dry-plate negatives have their qualities greatly marred by pinholes of all sizes, caused by dust that has gained access to the camera or slide. To the trained eye a pinholey negative always suggests untidiness, the enemy to consistent uniform excellence.

There is, however, another dust cause for pinholes that is too often ignored notwithstanding the great care used by the makers of dry plates to see that they arrive at the hands of the user in as nearly perfect a state as possible; particles of dust, or splinters of glass, abrasion of packing paper, and so on, are bound to be seen occasionally on the plates, and every plate should be carefully swept with a broad camel's-hair pencil before being placed in the slides. Those who do not adopt this plan will be surprised to find how much unexpected dust is capable of removal with advantage in this direction.

Before concluding our remarks in a succeeding number, on what proves to be a very large subject, we wish to point out as emphatically as we can a dust effect by which great mischief is continuously being produced. We refer to the simple matter of framing photographs. "Oh, it is only a photograph, and we want a cheap frame" is a very familiar cry; but, be the frame as cheap as it may, every photographer who has the dignity of his art and its reputation for stability at heart should insist upon dust being excluded from even the cheapest frame by the simple expedient of pasting the glass to the frame in the well-known way. We have seen, we can truly say, scores of pictures, greatly valued by the owners, which it was desired to know how to restore, as they were "fading." It was most difficult to persuade the owners that the "fading" was nothing but dust, dust in fact that had gradually entered, as it will do, through the finest aperture or chink. All pictures framed without the protection we allude to will become altered more or less by dust deposit to the injury of the picture, not to speak of its gradually increasing disfigurement. Yet such protection is by no means common; we should not like to state the smallness of the proportion in which we should estimate it is carried out. Suffice it now to say, we emphasise in the strongest manner possible the need for this protection for preserving photographs in their pristine beauty and chemical integrity.

Photography in Japan.—We are pleased to gather from the annual report of the Photographic Society of Japan, a portion of which we print among our Society intelligence, that that Society now boasts the respectable total of 140 members. From this we take it that both the Society itself and photography generally must occupy a tolerably well-established position in Tokyo, a result no doubt largely brought about by the efforts of Mr. W. K. Burton.

Quite Another Thing.—In a recent Continental note we remarked, in reference to the Paris Photographic Exhibition, that "French firms appear to give it a very hearty support, which may in some degree account for the coldness with which it has been treated abroad." We meant something altogether different of course, the word "atone" being intended for "account." A good French friend in Paris has drawn our attention to the error, for the opportunity of correcting which we are obliged to him. The *entente cordiale* between the photographic press of each country is therefore in no danger of being strained or threatened.

Photography in Parliament.—Among the candidates for the honour of a seat in the Imperial Legislature is Mr. W. J. Lancaster, the well-known maker of photographic apparatus, of Birmingham, who is contesting one of the divisions of that town. Glancing down the list of candidates, we observe the names of many amateur photographers. Let us hope that some of them will be successful, for, on the principle that a fellow feeling makes us wondrous kind, it will then be possible occasionally to get a question of photographic interest put to the Government on, say, such an iniquitously foolish law as the new methylated spirit regulations, or on other matters of interest which occasionally affect the comfort and convenience of the estimated quarter of a million photographers throughout the country.

Sensitiveness as a Factor in Exposure Calculations.—Dr. Vogel's experience of the increasing sensitiveness of gelatine plates if kept for any length of time, as referred to in our "American Notes" last week, suggests to us a point possibly of some importance in connexion with accepting the ascertained photometer speed of plates as a constant factor in exposing. If plates really do increase in sensitiveness—and there certainly seems some evidence to support the theory—then it is probable that their photometer speed can no longer be regarded as a constant factor if the particular batch of plates tested be kept a certain length of time between the moment of testing and the moment of exposure. It is no uncommon thing for unexposed plates to be kept many months before exposure. We

suppose that in that case it would be recommended to test the plates as soon as possible before using; but how would this get over the alleged difficulties of different batches of plates, and different plates in those batches, varying in sensitiveness, although the contrary is supposed to be the case by makers and users alike?

The Kew Method of Testing Lenses.—At the Royal Society recently, a paper by Major Darwin, "On the Method of Examination of Photographic Objectives at the Kew Observatory," was read. The paper describes the method of examination of photographic objectives which has been adopted at the Kew Observatary, chiefly on the recommendation of the author. In selecting and devising the different tests, Major Darwin acted in co-operation with Mr. Whipple, the Superintendent of the Observatory, and was aided by consultations with Captain Abney. Among other particulars we learn that the principal focal length is found by revolving the camera through a known angle, and measuring the movement of the image of a distant object on the ground glass; with the testing camera it is so arranged that an angular movement can be given with great ease and accuracy, and that the angle is such that half the focal length is directly read off on a scale on the ground glass. The observation is made when the image is at a point some fourteen degrees from the axis of the objective, and it is proved that the focal length thus obtained, even though it may not be identical with the principal focal length as measured on the axis, is, nevertheless, what the photographer in reality wants to ascertain. This test for distortion depends in principle on ascertaining the sagitta or deflection in the image of a straight line along one side of the plate. It is shown that to give the total distortion near the edge of the plate would not answer practical requirements, and that the proposed method of examination does give the most useful information that can be supplied. Definition is found by ascertaining what is the thinnest black line the image of which is just visible when seen against a bright background. It is shown that this is the best method that could be devised of measuring the defining power of an objective, and that it is not open to serious objections on theoretical grounds. The test for astigmatism is performed by measuring the distance between the focal lines at a position equivalent to the corner of the plate, and by calculating from the result thus obtained the approximate diameter of the disc of diffusion due to astigmatism.

OBSOLETE PROCESSES.*

No. 5.—The Taupenot Process.

In the article on the old, or original albumen process, it was mentioned that most excellent results could be obtained with it, but a long exposure was necessary; also that great precautions had to be taken in the preparation of the plates, in order to obtain a film free from dust spots; and, furthermore, there was the inconvenience of the plates having to be kept perfectly horizontal until they were dry, for, unless this was done, an even film could not be obtained.

The process now to be described is, to an extent, a modification of the original one, and was named after its originator, the "Taupenot Process," or, as it was more familiarly called, the collodio-albumen process, inasmuch as it was a combination of both the collodion and the albumen processes. There were two films, both of which had been sensitised in separate silver baths, the one collodion and the other albumen. Although more operations were involved in the preparation of these plates than in the older method, they were, on the whole, found to entail less trouble and care, as they could be dried in a vertical position, and the drying accelerated by heat. Added to this, the plates were more sensitive, and developed more easily, while the results, if not superior, were at least equal to those obtained with albumen alone. Therefore it is not surprising that soon after its introduction the original method was seldom practised, that is, for negatives.

In all the older processes on glass, the greatest care had to be bestowed on the cleaning of the glass, and essentially was this the case in the one under consideration, for not only with an imperfectly cleaned plate was there a liability to stain, but there was as well the almost certainty of a blistering of the film during the development. Indeed, in the earlier days of the process, blisters were one of the greatest troubles encountered in its working. Tripoli and alcohol, or tripoli and ammonia, were the most favoured cleansing agents.

The plate, having been cleaned, was next coated with iodised collodion. The mechanical condition of the collodion used was really of more importance than its chemical nature. One of a very adhesive character was necessary. That usually employed was such as was in use for wet collodion, after it had been iodised for some months and had become too slow to use for its original purpose. When the film had well set, it was sensitised in the ordinary silver bath—thirty grains of nitrate of silver to the ounce of water. The state of the solution was of minor importance. A bath that would yield foggy, or otherwise inferior, negatives if the plates were used direct, would still do quite well for collodio-albumen. After the collodion film was sensitised, it was well washed in several changes of water, and finally rinsed under the tap. After closely draining, the plate was ready to receive the iodised albumen.

The formula for the iodised albumen, like most others, varied with different workers. This is the one we generally employed ourselves:—

Albumen	12	ounces.
Iodide of potassium	1	drachm.
Bromide of ammonium	15	grains.
Liquor ammoniæ	1½	drachm.
Water	3	ounces.

With sufficient iodine to give a pale sherry tint. The whole was then whipped to a stiff froth, as described for the albumen process a fortnight ago, and allowed to subside. The liquid portion was then filtered, either through sponge or fine muslin. The albumen was applied in the following way:—A little was poured on the upper portion of the drained plate and allowed to flow over it in an even wave and off the other end into the sink, carrying what superfluous water there was before it. After draining for a few seconds, a fresh lot of albumen was applied, and this was flowed backwards and forwards over the plate for a minute or two, so that it might soak into the collodion film. The excess of albumen was then poured off into a vessel, to be used again as the first application to the next plate. The plate was then reared up on end to dry, either spontaneously or assisted by heat—the latter was most general.

When the surface had become partially dry, the plate was subjected to heat, usually by holding it before the fire until it became as hot as the hand could well bear. Strongly heating the plates at this stage was found to be a great preventive of blisters. In connexion with blisters, it may as well be mentioned here that it was a very common practice to give the plates a preliminary coating of dilute albumen, and drying, before the collodion was applied in the first instance. This thin substratum, though increasing the manipulations, secured an immunity from the trouble, and therefore was invariably adopted by some workers. In this state the plates would keep good for years. Up to this stage the plates could be prepared in open daylight, as any effect that the light might have upon the sensitised film was destroyed by the iodised albumen, which also obliterated any bad effects from a disordered silver bath.

The sensitising bath, like that used in the albumen process, was the aceto-nitrate of silver, but somewhat weaker—thirty grains of nitrate of silver and a similar proportion of acetic acid to the ounce of water was the strength usually employed. The time of immersion was short, not more than a minute or so. When the plates were taken from the bath they were thoroughly washed, first in dishes, and finally under the tap. They were then dried spontaneously, either in a drying-box or, more often, on the shelves of the dark room. The sensitised plates would keep good for a month or two; but, if they were treated with a dilute solution of gallic acid before they were dried, they would keep for a year or two.

With regard to the exposure, the plates were slow, though they were quicker than the original albumen ones. With a single lens, aperture, say, *f*-30, a landscape would require from five to fifteen minutes, according to the light. Here there was, with this process, considerable latitude allowable, and the best workers seldom, if ever, erred on the side of under-exposing.

* Concluded.

In the earliest days of the process a solution of gallic acid, with a drop or two of aceto-nitrate of silver, was the developer employed. Later on, pyrogallic acid superseded the gallic, and this is how it was used:—The exposed plate was first moistened with water. Then a plain solution of pyro—a couple of grains in an ounce of water—was flowed over the plate. In a short time this would bring out a faint, phantom-like image by reflected light, from which the correctness, or otherwise, of the exposure could be judged. If it had been rightly timed, the image would come out evenly, just as it does in a correctly exposed modern plate. When nearly the whole of the detail in the shadows was visible, the solution was thrown off, and another containing two grains of pyro to the ounce of water, restrained either with fifteen or twenty minims of acetic, or half a grain of citric acid, was flowed over the plate. It was then poured off and a drop or two of a solution of nitrate of silver added. It was then reapplied, and the development, or rather intensification, continued until sufficient density was obtained. If stains appeared on the surface of the film, as would sometimes be the case with a prolonged development, they could be rubbed off with cotton-wool under the tap.

As with the albumen process, so with this one, the image was of a highly non-actinic character, and the negatives of many novices were spoilt by over-development. If, by chance, the plate was under-exposed, detail was coaxed out by using a warm or, if necessary, a hot solution of plain pyro. If over-exposed, a large proportion of silver was employed with the acidified developer. The fixing solution was one of hyposulphite of soda, of about the strength now employed for gelatine plates.

The results obtainable with the collodio-albumen process are perfectly familiar to our older readers; so, to them, no comment is necessary. To our younger ones we may say that the process has yet to be invented that will yield finer negatives—that is, in the hands of those proficient in its manipulation.

CONTINENTAL NOTES AND NEWS.

An Old Friend in a New Dress.—Some ingenious German knight of industry has, it seems, been lately exploiting a mysterious and wonderful product, which was said to be of remarkable value as an accelerator if used as a preliminary bath before development. The substance was given the formidable name of monobrombrenztraubensaure! Dr. H. Vogel is reported to have submitted a sample of it to the cold and impartial scrutiny of analysis, and to have pronounced it to be nothing more and nothing less than our old friend, hypo!

Coloured Transparencies.—M. Meunier-Pouthot is said to be introducing commercially a plate which, with a special kind of toning bath, of which no details are to hand, allows of the deposit being easily coloured either yellow, yellowish brown, reddish brown, plum colour, violet, red, blue violet, indigo blue, or greenish blue as may be desired. All these colours are said to be obtained with one toning bath, much, if not all, depending upon the time of exposure and toning. Possibly, by local toning, this process is susceptible of yielding part-coloured lantern slides and transparencies.

How to Tell Whether a Plate has been Exposed or Not.—M. Papazogli, of Vaud, suggests treating the corner of the plate with the developer; if the plate darkens, it has, of course, been exposed; if not, the colour of the deposit is unchanged. It is also suggested that this is a ready means of ascertaining whether a plate has been over or under-exposed. The efficacy of this highly ingenious method, which we have all unaccountably overlooked up to now (save and except M. Papazogli), is somewhat discounted by the circumstance that, though the margins of a plate may not darken under the developer, the centre may, nevertheless, have been exposed, and thus the door is opened wide for error. So, once more, *cui bono?*

An International Photographic Exchange.—Messrs. Hamfeld & Stahlberg, editors of the Helsingfors journal, *Cameran*, are issuing a polyglot circular to Swedish, Finland, Russian, German, French, and English amateurs, asking them to send to Messrs. H. & S. ten or more unmounted prints from their negatives, when they will receive in exchange an equal number of the same-sized prints—of course, of different subjects. Thus the amateur has a ready means of making an international collection of amateur work from different parts of the world. Messrs. Hamfeld & Stahlberg propose to open branches in St. Petersburg, Vienna, Berlin, London, and New York. It is difficult to see what profit, beyond that accruing to pure philanthropy, awaits Messrs. Hamfeld & Stahlberg in their enterprise. If any of our amateur readers have received the circular spoken of, we should be glad to see it.

M. Villain's Coloured Positive Process.—In describing his process before a recent meeting of a French photographic society, M. Villain gave the following details:—Paper is floated on a bath consisting of

Water	1000 cc.
Bichromate of ammonium	50 grammes.
Metavanadate of ammonium	5 „

The paper is dried at a low temperature in the dark, and is then exposed under a negative until the details are well out, being next washed to remove the unaltered bichromate. The picture is now immersed in the colouring bath, which is maintained at a temperature of about 90° C. If, after "colouring," the whites are not clear, a warm bath of sodium carbonate, or a cold bath of lime carbonate acidified with hydrochloric acid, is applied. The colouring agents employed include artificial alzarine, isopurpurine, alzarine blue, alzarine black, green, orange, anthracene brown, and others. Combinations of these may be applied, and thus a large variety of tints obtained, all of them stable under the action of light.

ADVANCED PHOTOGRAPHIC WORK FOR AMATEURS.

II.

Having referred in a previous article to the making of the emulsion, and the coating and setting of the opal plates, we now come to the consideration of what is also a very important factor in the operation, viz., the drying of the coated plates.

Undoubtedly, since the advent of the gelatino-bromide process, perhaps there has been no greater stumbling-block to the amateur plate-maker than that of a handy and reliable method of drying his coated plates, for doubtless it has been at this stage that failures have arisen, and hence the dread many experienced workers in a small way have of tackling the making of their own emulsion.

From time to time quite a numerous class of drying boxes and contrivances have been suggested for the purpose, some of which are so constructed as to utilise gas as a warming agent to the interior of the chamber, but all seem to agree on the necessity of having a current of air freely circulating through the box. When such a box is at hand, the difficulty of drying is entirely overcome, but there is no need for any ordinary worker to refrain from undertaking the work we are considering on account of not having at his disposal a drying box. In the case of the emulsion we are dealing with, we have not an article of such exalted sensitiveness as a bromide emulsion, commonly met with in dry-plate practice or negative work. What we are dealing with is a printing-out emulsion of much the same sensitiveness to light as ordinary printing paper, and hence the same absolute precautions from every ray of white light during drying are not so imperative. This being so, there are many simple, homely ways whereby plates, coated with such an emulsion, may be dried without the aid of any of the so-called drying boxes or chambers, so necessary in bromide emulsion work.

I have said that in all the arrangements for drying plates of any description an essential element is that a current of air be made to pass over the films. Let this *desideratum* once be grasped and understood, and an enthusiastic worker will not be long in rigging up some homely arrangement for drying the plates. I may, however, describe three entirely different methods that I have seen adopted by some of my pupils for the drying of the same kind of plates we are considering. One very simple way adopted by a gentleman—who, by the way, is merely a lodger, and who, therefore, has not the entire control of a household—is by the utilisation of the fireplace in his bedroom, and, all told, this is perhaps as simple a plan as any that

can be arranged. Having coated a few opals, he opens the damper of the fire-grate, so that a current of air passes up the chimney. He then brings in a box about three feet long by twenty inches square, with both ends knocked out. This box is placed close up to the fire-place, and some clothes padded round the end, which he places against the grate. I have seen him utilise his "breeks" for the purpose. This long box acts like a tunnel, and the air rushes in and up the chimney in fine style. Plates coated with an emulsion as described will dry evenly and perfectly, in dry weather, in about four hours by this simple means. He generally so arranges to have the plates placed on the tunnel just about bedtime or after dark, and during the early hours of the morning he gets out of bed, and stows the opals away in grooved boxes. Another method employed by an ingenious amateur is on the same lines as the above; only, instead of using a long box, he utilises his large 12×10 camera. This he places, with the front out, up against the fireplace, and, having placed some sheets of brown paper to protect the inside of the bellows, he places his half-plate opals inside, and gets up in the early hours of the morning and merely folds down the focussing glass, over which he throws a dark cloth. After breakfast the plates are then removed to a store-box.

Another very simple way is the using of a grooved box of the same size as the plate coated. Out of the top and bottom of the box a long strip of the wood is removed; this extends the full length of the box. Over this apparatus a length of coarse muslin is tacked. When the plates are placed in the grooved boxes the lid is shut down, and after dark the box is placed on end in some place where a draught or current of air passes, such as an open doorway, or in front of a fire-place, as described. The muslin tends to prevent dust getting on the surface of the plates, but the plates take slightly longer to dry. However, it is quite a good plan. Either of the above methods may be adopted with a certainty of success provided a current of air be made to pass over the films. Do not be tempted to use heat in any shape or form, and when such simple means are adopted the drying difficulty is at once overcome, and we have on hand a supply of opal plates of about the same sensitiveness as ordinary albumenised printing paper, and all that remains to be done is to place the same in an ordinary printing frame in contact with a suitable negative to print in the shade, according to the requirements of the particular negative used. Of course the face of the opal cannot be inspected during printing like a piece of sensitive paper, but it is quite an easy matter to run a pilot alongside during the printing operation. This may be done by taking a negative of similar density and placing in contact with it sensitised paper, and when the one is up the other will be about right. A very little practice with each batch of emulsion will show the comparative sensitiveness of the opals to the paper used. It is well, however, to print deeply. On removal from the printing frame, the opals are treated in exactly the same way as ordinary silver prints. That is, they are first subjected to washing in several changes of water, they are then toned with a very weak acetate bath, which may be conveniently made up as follows, viz., one tube of gold, one ounce of acetate of soda, and forty ounces of water, prepared the day before, being used. When going to tone, add the same amount of water to the quantity taken from the stock solution as above, but do not tone just into the purple, for the film will dry at least three tints darker than the pictures appear when being taken from the fixing bath.

Provided the plates are evenly coated, and ordinary care exercised in the manipulation, the surface of the opals will be found to be quite evenly toned; but, should it be found that slight cases of irregularity are apparent, then a preliminary bath of weak alum and water will be useful. The plates are then fixed in a weak hypo bath, and, after careful and thorough washing, are set aside to dry, when pictures of more than ordinary beauty will be the result, and which will be sure to cause more admiration than any silver print on paper ever produced.

The opals may be finally mounted with a cover glass, having a cut-out mask or mount inserted between the film and the glass, and bound round the edges with lantern strips, or they may be framed as taste dictates.

An emulsion such as I have described comes in very handy in another way at times, for who has not among their collection of negatives a plate that would not be benefited by some dodging, whereby the dense high lights of the negative would be made to print more in harmony with the shadows and middle tints of the picture? Such cases are very frequently to be met with, and, as a rule, the treatment generally adopted is the flooding of the glass side of the negative with ground-glass varnish, or other similar material. When such is used, there is always the after-manipulation required in the removal of the varnish from the high lights by means of a scalpel, whilst the middle tints are left just to look after themselves, for it is not easy to deal with them when ground glass or some other semi-opaque substance is used to retard the printing of the shadow portions of a negative only. When, however, a worker has a small quantity of the emulsion referred to beside him, he has in his possession a most valuable medium for correcting such inequalities in a negative, and the application of such is an operation of much interest to those who desire to follow in a somewhat higher track than the mere printing of a negative just as it happens to turn out good, bad, or indifferent.

Some writers pooh-pooh the after-improvement of negatives in every shape and form, and condemn retouching and *all dodging* as outside the pale of legitimate photography, and even to such an extent was this carried that amateur photographic societies were beginning to make such strictures in their rules for competition that were simply absurd. In my opinion, every possible means should be employed to improve negatives, and so get the most pleasing results in the way of prints from them.

Here, then, is a very simple way of treating a negative that has over-violent contrasts. First, let the worker take a sheet of glass the same size as the negative, and having made it fast to the film side by means of ordinary gummed lantern strips (the object of this is to protect the film from any possibility of damage during the operations that are to follow), then let him take from his stock of emulsion, which, when melted, will be sufficient to flow over the glass side of the negative. Of course, this must be scrupulously cleaned. The operation, in fact, is just that of coating a plate. Having flooded the negative, it is set on a levelling stand, and in due course placed in the drying tunnel, and when dry is ready for exposure. We have now a negative with plain glass on the film side, and a coating of printing-out emulsion on the glass side. The negative is now placed in an ordinary printing frame, and a piece of black velvet or other suitable soft material placed over the sensitive coating of emulsion so as to avoid any damage to the film by pressure from the springs and back of the printing frame. But little consideration will be required to understand that when such a plate is exposed in a printing frame to daylight the shadows and middle tints will be impressed before the high lights are printed at all; and this is just what we require in such a case as we are considering—in fact, we print a partial positive image in close contact with the glass side of the negative, and the image so printed acts as a most beautifully perfect shield over those parts that it is desired to retard the printing of. When it is deemed that sufficient detail and density has been printed, all that remains to do is to fix the plate by means of an ordinary hypo solution. In doing this it is more convenient to apply such (after the plate has been washed under the tap for a minute or two) by means of a flat camel's-hair brush. This will prevent the need of placing of the entire negative in the hypo bath, and when such is gone about expeditiously the paper binding to the cover glass of the negative will be quite sufficient to protect its surface from damp. When fixed, a slight wash and after-application of an alum bath will finish the operation, and we have then performed one of the cleverest dodges in the way of doctoring a faulty negative that I know of. To those anxious to improve such negatives I say, Try it. T. N. Armstrong.

CLEAN NEGATIVES.

At a photographic meeting held just recently, and reported, mercuric chloride was recommended for the purpose of removing the iridescent stains frequently seen when developing, *with pyro*, old and stale gelatino-bromide plates; the words *with pyro* are used advisedly, the stain not making its appearance when an *iron* developer is used. The statement should not in my opinion go out to the public without qualification. If it be true that a solution of mercuric chloride will remove this stain, and it is not my invariable experience, it is far from being the best chemical for the purpose.

We are probably half way through with the development of a negative, when, hey presto! appears this demon stain, little or more, according to the quantity of ammonia used in the developer; further detail under these circumstances is not to be got, therefore we wash and fix the plate.

Now, to *intensify*—for that is what it means—with mercury, is not the thing to do yet, for it means clogging up the shadows of an already dirty negative. The thing to do is to clear away the stains first, and *then* intensify as follows:—Add a few drops of a saturated solution of red prussiate of potash to a weak hypo solution (half an ounce to the pint). The stain disappears very quickly. If the negative has not been allowed to dry, a tuft of cotton-wool assists the action very much; but it will be easy to over-do it, so that as

soon as the stain has gone remove the negative and wash thoroughly We have now a beautifully clear and clean negative, which will be *improved*, in most cases, by intensification with mercury. Colour and density will be satisfactory.

With regard to green fog, this is unquestionably removed by mercury treatment; but here, again, where is the advantage? Green fog I have not met with for some years, but if I remember rightly, it was never noticeable till after the negative was fixed and dried. Therefore, in the majority of cases, the negative was already dense enough, and needed no further intensification—in fact, would be spoiled by such treatment. If thought necessary to remove the fog, and I believe it was generally thought not to impair the printing qualities of the negative, the bath already mentioned will answer every purpose.

J. Pike.

TELESCOPIC PHOTOGRAPHY.

About three years ago, I made several attempts to photograph distant objects, and a few notes of my experiments were published in the Almanac, along with an engraving from one of my negatives. The lens I used was a very fine two-inch telescopic object glass, by Wray, of twenty-five inches focus, and a No. 2 microscopic eyepiece by Zeiss. I found, however, that such an eyepiece was not at all suited for the purpose. The image on the screen was very bright, but there was always an amount of fuzziness which made the negatives taken with it very imperfect as to sharpness. I had done nothing farther in the matter until my attention was again directed to it by the notices and correspondence in regard to Mr. Dallmeyer's proposed tele-photographic lens. I have not seen any of these lenses or any of the photographs taken with them, nor have I further information as to what had long ago been done by Dr. Hugo Schroeder other than what has appeared in his letter in this Journal.

When I was experimenting with the Wray objective of twenty-five inches focus, I found that when the camera was placed on the western shore of the Gareloch at Rahane, which is just about a mile broad at that place, the field of view given by the combination I was using was, on a quarter-plate, only sufficient to enable me to get into the negative one-half of the steamer *Gareloch*, which was then lying at Balernock Quay on the eastern or opposite shore. This seemed rather too great a magnification for ordinary landscape photography even of a moderately distant object, and in the experiments I have just made I have adopted a much shorter apparatus. I came into possession the other day of an old photographic portrait lens which belonged to the late Dr. John Thomson, R.N., a former President of the Edinburgh Photographic Society, and I determined to use it as the objective to form the image, which I prepared to magnify in the camera. This lens has an equivalent focus of about eight and a half inches, and the combinations are about two and one-eighth inches in diameter. I was at first somewhat doubtful if it was actinic, as it had evidently been made at a very early date. I found, however, on trial that it was all right as regards its actinism. Now, having got my objective, in what way was I to magnify the image it gave me? A Huygbenian eyepiece would not do. I had settled that by my previous experiments. I did not believe in the Barlow achromatic concave amplifier which Mr. Dallmeyer uses. I had, however, in my microscope box a very fine No. 4 projection eyepiece by Zeiss, of Jena, which I knew was perfectly corrected for the chemical ray. I have not noticed in all the writing and notices which have appeared recently that any one has used, or suggested the use of, such an eyepiece for tele-photography. I felt sure that I had found exactly what I required, and I at once made a rigid box camera, a good substantial one, and, although it is made out of a few scraps of old packing-boxes, I have stained it with bichromate of potash, exposed to sunlight, and then varnished, and I should not be at all ashamed to show it to that learned body, the Convention, when they meet in our modern Athens next month. The baseboard of the camera is exactly eighteen inches long. From the flange into which the portrait lens is screwed, to eye lens of the projection eyepiece, is 7½ inches, and from the eye lens to the ground-glass screen of the camera is 0½ inches. I find that this distance is required to give me a sufficiently large circle to fill or almost fill the breadth of a quarter-plate.

Yesterday evening, between seven and eight o'clock, I exposed three quarter-plates, and these I have sent to the Editor that he may see the quality of the definition given by the combination I have described. Each plate got ten seconds' exposure. These are the first plates I have exposed, and were all three first shots. I find, upon measuring the size of image given by the portrait lens alone, and also the same image when used along with the eyepiece, that the camera gives me a magnification of exactly six times. This was ascertained by turning it to a signboard and measuring the relative length of the two images; or, again, the magnification may be arrived at in another way. I found, on calculating the equivalent focus of the projection eyepiece by Cross's formula, that it was equal to a single lens having a focal length of 1·46 inches, or, as nearly as may be, one and a half inches. Dividing the focal length of the portrait lens by one and a half we get the figure six. I think I am right in assuming this method to be very nearly accurate, because the distance of the eye-lens from the screen is just about ten inches, the *assumed* normal focal length of the human eye.

One thing seems to be a most important factor against the use of combinations of lenses for photography, and that is, the difficulty of getting more than one focal plane into focus. We know that, whatever may be said to the contrary, it is impossible to see more than one focal plane in the microscope, and the same defect, if it may be termed so, is forcibly apparent when focussing with the combination I have described above. What, however, one looks for, and should strive to obtain, is such a reasonable arrangement as not to render the want of sharpness on the resulting photograph unpleasantly conspicuous to the eye. Of course, one need not be restricted to a quarter-plate in such a matter. It is only necessary to increase the distance of the plate to get any reasonable size covered. I should have liked much better had my portrait lens been of greater focal length. One of about twelve inches equivalent focus would suit very well. Taking, however, that I have, and multiplying its focal length of eight and a half inches by six, the magnification used, it is easily seen that with the short camera I used I get, practically, a picture the same as if I had used an ordinary photographic lens of six times eight and a half, or fifty-one inches focus.

Procella.

OLD SILVER PRINTS.

II.

Before we place our prints, after toning, in the hypo solution, all the free silver nitrate and salts soluble in plain water have been got rid off, and there only remain those that require chemically decomposing for the hyposulphite to act upon. This it does by dissolving the chloride after changing it into hyposulphite of silver, which is only quite soluble in a strong hyposulphite of soda solution and water. Some albumenate of silver has also to be removed. This is somewhat more difficult to thoroughly effect; in fact, it very often is left in the prints. *No* silver should be found in the whites of a properly finished print.

The method of doing it is to use a tolerably strong fresh solution of hyposulphite of soda for a sufficiently long time, or preferably two baths of the same strength, with or without the addition of a little ammonia. After the action of the hypo on them, we have the prints saturated with salts that are soluble in ordinary tepid water; and if the prints are removed singly to dishes where they can be alternately washed and pressed for a few hours, with a constant change of tepid water, they will in all probability be freed from anything prejudicial to their permanence. The final rinse or two may be in tolerably hot water with advantage.

Prints will be much brighter and better for a short washing, of not more than two hours or less; after a more prolonged soaking, the long immersion invariably reduces the gloss of albumen prints, and does not conduce to their permanency—rather otherwise. The wet washed print should be *tasteless and odourless*; if any metallic taste remains or any odour is distinguishable, it may be concluded the prints, for some reason or another, have not been properly fixed or washed. It is surprising how seldom the process of fixing and washing is properly done, even by men whom one would have thought to be thoroughly versed in the matter. A very usual way of working is, after a wash after toning, or even without it, to gather the prints into a bundle and plunge them all together into a small quantity of hypo bath; to separate them afterwards. It stands to reason, if a large number have to be separated, those last moved will not have received the same amount of fixing as the first did; it may make from three to five minutes' difference, a consideration when ten or fifteen minutes is the time allowed in the hyposulphite solution. They are then once more gathered into a bundle, pressed with the hands, and plunged altogether into clean water, to be again separated. It is very probable that, by this style of working, some of the prints do not get separated, and consequently neither properly washed nor fixed; the only excuse offered, it economises the time, but if it does, which is questionable, it is at the expense of the prints.

Another risky proceeding, with regard to permanence, is fixing several batches of prints in the same hyposulphite solution one after the other. The last batches, in all probability, are not fixed so well as the first; a little extra time being given will not make up for deficiency of solvent power, especially if the hypo bath was weak to begin with. Weak baths have been, time after time, recommended

to prevent the blistering of albumen paper, but I am firmly convinced that weak baths will not properly fix any prints, no matter how long they remain in them; time is not a substitute for strength, for the objectionable salts in the prints are almost insoluble in weak hypo, and this, with a low temperature, as very often happens in winter, practically leaves the prints unfixed. Temperature is an important factor through all the processes, none of them working smoothly and well if it is very low. Very high, say 100° F, has also its disadvantages by making the prints less brilliant; I do not allude to the final washing, but to the toning and fixing. I have found that the presence of hyposulphite alone, in a properly fixed print, is *not* detrimental if the prints are kept dry, and not particularly so if they are not specially cared for in this respect. To ascertain this, I prepared two prints carefully in the same solution, at the same time, washed and dried them, afterwards dipping one for a few minutes in a twenty per cent. solution of hyposulphite of soda, again, just rinsing, drying, and fastening each up in a bottle suspended in the full light, out of doors, for a long time. There was not the slightest apparent difference in either; afterwards a bit of damp blotting-paper was introduced, and after some time had elapsed no change had taken place, and the experiment was dropped. In all probability the damp would, in course of time, have produced some damage, and to a greater extent with the one containing hyposulphite than the other; but what prints would not suffer if continually exposed to a damp atmosphere, either with or without special chemical agents in contact with them? Imperfect as the experiment was, it satisfied me that hyposulphite of itself is not the bugbear it is made out to be in connexion with silver prints, and I certainly think the lasting qualities of the many old prints we see support this opinion.

When hyposulphite of soda is a *real enemy* is during the time the prints contain free silver nitrate, when the *least trace* will not only produce stains, but utterly ruin the pictures, if the usual alkaline methods of toning are employed. If a yellowish glare appears on the prints in the toning bath, it may be certainly concluded that hyposulphite of soda has somehow or another contamiuated it, when the merest trace is sufficient to do this and to spoil a whole batch of work. It will be noticed that, if this occurs, it will be almost impossible to wash out a peculiar sulphur odour that is very perceptible when the prints are warmed, as well as when partially dry. It is a remarkable fact that such an infinitely small amount of hyposulphite of soda should have the power of producing so great an effect. The yellowish glare alluded to seems to be sulphur, but the *mere trace* of hypo producing it could scarcely be sufficient to supply enough to spoil an almost unlimited number of sheets of prints. I think this is a matter that it would be useful to investigate. If the deposit is not sulphur, what is it, and where does it come from?

EDWARD DUNMORE.

EARLY PHOTO-MECHANICAL PRINTING PROCESSES.

[Journal of the Photographic Society of India.]

UNDER the heading *Processes before their Time*, the writer of an editorial note in THE BRITISH JOURNAL OF PHOTOGRAPHY for April 29 remarks that the method of breaking up the tones of a subject into lines or dots to obtain a printing plate was first practised and patented by Fox Talbot forty years ago, and that his photographic process is practically the same as the "photogravure" methed now practised. He also points out that half-tone blocks, and good ones, were produced by Pretsch in 1855, and that as far back as 1866 Bullock Bros. prodnced photo-lithographs in half-tone quite equal to those now made. He asked why, therefore, did these processes remain dormant so long? and gives his opinion that the reason is, because the processes were introduced before their time; their valne was not recognised, and therefore they were not appreciated. This may be to some extent true from the fact that the full value of photography for reproduction was not then known, but the real reason of the delay in recognising the merits of the old processes is, more probably, that they were all of them deficient in some point, the want of which made them nseless for really practical work. In the later methods these missing links have been supplied, and the defects of the old processes having been overcome in various ways, they have been put on a really practical footing, and as soon as this was the case they have been taken into use. For instance, Fox Talbot's early method of photoglyphic engraving contained all the germs of the photogravure process; the resin ground, the negative chromo-gelatine image, and the etching with perchloride of iron were much the same as at present, but it failed for the same reason that all the old carbon processes failed, by having a quantity of soluble or unchanged gelatine at the under surface of the exposed image, so that the etching fluid penetrated to the copper underneath even the densest parts of the gelatine image, and it was not until Klič applied Swan's method of carbon printing to the photoglyphic process and etched through the *developed* image that really practical results were obtained, and now the obtaining of a well etched plate with perfect gradation from the most delicate lights to the deepest shadows is a comparatively simple operation, which it certainly was not with the original process, in which it was exceedingly difficult to keep the gelatine film down on the plate, and to obtain full gradation in the etching.

It was the same with the various methods of photo-galvanography, or photo-electrotype—they were very good, but not thoroughly practical; they took a lot of time and required a great deal of hand work, and consequently they have been largely superseded by the etching processes.

Again, Poitevin's method of printing off an exposed gelatine film had all the elements of the present photo-collotype processes, but was quite unworkable in its early form, and it was not until the principle of sunning the exposed gelatine film from the back was introduced that it became practical.

Then, as regards half-tone block processes, no doubt various half-tone block processes, some of them good ones, have from time to time been brought forward by Pretsch, Placet, Dallas, Woodbury, Ives, and many others, but nothing very practical was done until 1883, when Mariot enounced the principle of graduated diffusion of the lines and dots by which the image was broken up, and Meisenbach about the same time brought out his "autotype" process of photo-block printing, which depended on this principle of diffusion by the nse of ruled screens placed in front of the sensitive plate, as noted in my paper on *Half-tone Photo-block Processes*. Since then the latter method, and modifications of it, have taken possession of the field, and naturally, as soon as publishers and newsvendors found that they had a really workable process of the kind available, they have hastened to make use of it, somewhat to the detriment of the older and more artistic woodcut. It is not so much that these new reproductive processes were not wanted before as that they were not available in a really practical form as they now are.

COLONEL J. WATERHOUSE, S.C.,
Assistant Surveyor-General of India.

THE LATE LEWIS MORRIS RUTHERFURD.

WE are sorry to learn of the death of Mr. Lewis Morris Rutherfurd, which took place at his country home, "Tranquillity," New Jersey, on May 30th.

Mr. Rutherfurd, says Mr. O. G. Mason, in the course of a biographical notice of the deceased man of science which appears in a recent number of the *Photographic Times*, was born at Morrisania, New York, on November 25th, 1816. His father's family can be traced back through its Scotch descent more than seven hundred years. His mother was a direct descendant of Lewis Morris, one of the signers of the Declaration of American Independence. In his early years Mr. Rutherfurd gave proof of that peculiar feature of descent which physiologists have long observed, namely, the inheritance of traits of character belonging to members of the family two or three generations earlier in its history.

At the age of fifteen his education was such as to enable him to enter the Sophomore Class at Williams College, where he graduated, in 1834, at the age of eighteen. While at college his love for investigation was so intense that he became assistant to the professor of chemistry and physics in the preparation of lectures before the class, making many pieces of apparatus for their illustration with his own hands. In his early college days Mr. Rutherfurd took his first steps in the field of Astronomy. Finding among the unused apparatus of the college laboratory the disjointed remains of an old telescope, he reconstructed the missing parts and put the whole into working order. While engaged in study, and later in the practice of his profession, his leisure hours—or what would be termed such to others—were by him fully occupied in the embodiment of some chemical or mechanical device for the furtherance of his favourite science.

In the early days of his professional life, he married Miss Margaret Stuyvesant Chanler, a niece of Peter G. Stuyvesant. His wife's fortune added to his own ample inheritance was such as to permit the abandonment of his profession and the devotion of his entire time to travel and study. In 1849 he went to Europe, where he remained several years. During this visit, he met and studied with Professor Amici, the famous Italian optician, from whom he, doubtless, learned many fine points in optical work, especially in connection with the microscope, which served so well his purpose in later years.

After his return from Europe he constructed upon the lawn of his residence at Eleventh Street and Second Avenue—what was then the finest and best equipped private astronomical observatory in the country; here in the early sixties he made with his own hands for his great equatorial refracting telescope a lens of thirteen inches aperture, corrected especially for celestial photography; this lens, worked out upon his own formula and the first of the kind ever constructed, was a wonder to the astronomical world, and has since created a revolution in the methods of observation. His photographs of the moon, planets and star clusters, made with this instrument, have not yet been excelled.

At about this time he began his work upon the spectra of celestial bodies; not being able to find instruments suited to his use, he equipped—with his own and the best tools procurable—a shop in his residence, where he constructed some of the finest apparatus known to science. Many of these inventions of his active mind have served as models in the leading observatories of our own and foreign lands. Early recognising the advantages to be gained by the use of diffraction grating of finely ruled lines upon glass and metal, instead of a long train of prisms for the decomposition of light in spectra study, and learning that only small imperfect gratings made by Nobert—who kept his process a profound secret—were procurable, Mr. Rutherfurd invented and constructed a ruling engine, upon which gratings were made far surpassing any others known, some of these having more than seventeen thousand lines to the inch; many of these gratings were generously presented to his fellow workers in spectrum analysis. With these gratings his great photographs—more than eleven feet long—of the solar spectrum were made. For the measurement of the distance of stars on the plates made in the great equatorial he constructed a micrometer, which has proved most valuable in observatory work. The measurements made upon this instrument, filling many manuscript volumes of closely tabulated calculations, was issued from the press by Columbia College but a few days before the death of Mr. Rutherfurd, but too late for his examination. His illustrated papers, published in the *American Journal of Science*, show him to have been the first to classify the stars by their spectra. His knowledge of chemistry, optics and astronomy enabled him to devise and carry out plans worthy the high position he held in the ranks of the most learned.

In 1867 Mr. Rutherfurd was elected President of the American Photographic Society, on whose official board he had many years served as first Vice-President. During his administration the Society became the Photographic Section of the American Institute. He was never known to wear any one of the many decorations, emblems of rank, or acquirements which had been conferred upon him. All these were laid away in private receptacles of his home, and but few of his intimate friends ever knew of their existence. Some of the honours bestowed upon him, like the award of the Count Rumford medal, and the naming by special act of Congress as one of the organizers of the National Academy of Science, were too conspicuous and publicly known to be hidden away. The construction of instruments, the perfecting of processes, and the solution of problems which made the proudest works of nature write their own histories, was to him far more than the plaudits of his fellow-men. Rendering the collodion film stable under all conditions of atmospheric change, and making that film extra sensitive to the light in a telescope which produced the image of a distant planet, sharp in all its details, would alone entitle a man to lasting remembrance.

When he felt that he had reached a time for rest, his instruments of labour, the fine equipments of his observatory and the recorded results of observations covering a period of many years, were presented to Columbia College, in whose councils he had served as trustee more than the quarter of a century. During the last few years of Mr. Rutherfurd's life, impaired health prevented his taking an active part in astronomical work, but his wise council was sought and recognised as being of the greatest value. His liberality in the diffusion of the knowledge which he had gained was known and appreciated by hundreds who sought his advice.

BINOCULAR VISION AND ASTRONOMICAL PHOTOGRAPHY.

In some former articles and correspondence, published in these pages many years ago, I endeavoured to show what the principles of binocular vision involved in the appreciation of the third dimension of space or distance, as applied in photography, were, and gave some examples in illustration of then well-known stereoscopic slides, which had been produced from portions of several negatives, each of which appeared at its proper distance in space, exactly as it would had the whole of the picture been made in one operation; and, in more recent years, by other articles, treating of the possible application of the same principles to more strictly scientific purposes. In returning to the subject, I hope to offer some suggestions and describe an instrument that will be of service to astronomical photographers, to enable them to test the accuracy of their work as it proceeds with greater speed and efficiency than, perhaps, is possible at present.

As an outsider and a photographer, I have been greatly interested in the efforts of astronomers to press photography into their service, and the means adopted to compel it to be truthful. To ensure its records being possessed of this indispensable quality of truthfulness with gelatine in the question is by no means an easy task, and it strikes me that the star-charting scheme will fall very far short of what some of the more sanguine of its promoters expect. Whether the exact formula and mode of preparation of the gelatine plate to be employed for the purpose have been decided, and what sort of an article it is, I do not know; but, if it be no better in structure than some highly commended star plates which have been in my hands, there is room for improvement. These would not satisfy me, nor their producers, after the first blush and excitement of novelty had passed off. Both the thickness of the films and their granularity were alike fatal to refinement and accuracy. Apart from structure, the necessity of re-wetting the plates for the purposes of development and fixing introduce into a mass-like gelatine an element of uncertainty in the redistribution of strains and physical changes of other kinds, too delicate to be detected by ordinary observation, even when assisted by a network impression, or otherwise than by the most careful micrometrical measurements and comparisons.

In considering the matter, it occurred to me that, if some method of comparison between the negative, or a diapositive from it, with the actual or focal image of the same region in the field of the objective, between two negatives or diapositives from them, taken at the same period of time, or at intervals of six months or other period, or a comparison between one diapositive and the same region in the telescope at intervals could be made; in each case dealing with the photographed images, or photographed and aerial images, in small zones at a time to avoid confusion, the following results might be expected: In the first case, the superposition of the two elements by the eyes in the same field of view would, in accordance with the laws governing binocular sight, cause any displacement or distortion (probably occurring in patches) to at once appear as occupying another vertical plane nearer or farther away, as the point or points under observation were out of position either to the inner or outer edges of the plate undergoing test. Comparison of the second pair, if both were exactly alike, would show the stars as being in one vertical plane, any discrepancies taking up other planes, as in the previous instance. Those at intervals of six months or shorter periods might show parallax in some stars, due either to proper motion or position in space, to decide which of the two further tests would have to be applied. Any portions of such pairs of plates could be greatly magnified, the aerial images at the focus of the enlarging lenses being examined and compared under the binocular eyepieces, when all defects and displacements would in consequence become coarser and more prominent in proportion. Something similar would take place in the final instance—that of comparing the diapositive with the telescopic image at any time. A body new to the region or slight motion of any one would be shown as occupying a position apart from the remainder, apparently nearer or farther away, as the case might be. The method, therefore, includes the detection of defects in the process employed, and the possible discovery of planetary or other bodies, or that some of the smaller stars are sufficiently near to show parallax, and are small from size instead of remoteness.

It will be well to give here a few words of warning. Do not let any one imagine he is going to apply the method straight off without any preliminary cultivation of the delicate discriminating powers binocular vision confers. A course of instruction with much practice is essential, under the influence of which the eyes become extremely sensitive, and detect differences of the most refined nature. Such was my experience in the cultivation of my own sight for the duties devolving on me many years ago. It was part of my work to fix up combination slides for the stereoscope, and to both photograph and manufacture "stars" for some of the beautiful slides then favourites in the market. The home-made orbs proved vastly superior, having more sparkle than anything produced by means of the camera. As they had to be pricked in the dark-blue films with a needle at an exact distance asunder, some mechanical help was necessary. This had to be adjusted to produce "star" plates for the series of the particular scene under treatment, and was accomplished by trial and error on a waste plate till an amount of separation was found that satisfied the sight. This is the kind of schooling the eyes require if an observer would have success.

The binocular instrument for the examination and comparison of pairs of plates is of the nature of an enlarging camera box, but having a division down the centre, and a pair of rectilinear lenses of ten inches focus or so, mounted on fronts, and sliding within it, one in each half. The front of the box or boxes is fitted with carriers for the plates, one of the latter being put in position on either side of the division, in front of its respective lens. Behind are mounted a pair of telescopic or other eyepieces for viewing the aerial images enlarged, or otherwise, which the lenses have formed of the plates, or parts of the plates, in front, and suitable rackwork and fixings applied to the

whole to bring portions of the plates into the field of view, to adjust the extent of magnification or perfect the focus. An instrument of this description will be available for the comparison of photographs of spectra, or of anything else in which change is suspected, and of which two distinct exposures have been made. The vagaries of a gelatine plate could be made manifest by the same means. The pictures may be magnified to almost any extent, and, as their enlarged images are under examination in air, no disturbing elements arise to discount results, such as might be expected if the making of another photograph in the enlarged condition were necessary. To go to extremes by way of illustration, there is no reason why the two diapositives should not be thrown by a pair of lanterns on two screens at the opposite ends of a large room, and viewed as one from the centre—reflecting stereoscopic fashion—by means of an opera glass, fitted with right-angled prisms, or mirrors, at a right angle, or in any other way by which the full benefit of binocular effect may be obtained from the screen.

To compare a diapositive with the aerial image of the same region at the focus of the telescope or objective which produced it, a long box or tube fitted with a lens and carriers in a similar way to one half or side of the instrument just described, is mounted alongside of the telescope, or at right angles if more convenient, with mirror to divert the image into line. The transparency is placed at the front and sufficiently illuminated, the lens being adjusted to give an image exact size. A binocular eyepiece is then arranged to take in this image and that in the telescope, and unite them for comparison, as a pair of pictures are in the popular form of stereoscope. Such an arrangement as this creates a binocular telescope, whose eyepieces may be made to view a region from two points of a base line equivalent to the whole diameter of the earth's orbit.

If I have failed to make my meaning clear on any point, I shall be glad to do my best to explain it more fully. JOHN HARMER.

ART: ITS MISSION AND CATHOLICITY.

"Art is the expression of one soul talking to another, and is precious according to the greatness of the soul that utters it."—RUSKIN.

How little that hypothetical ape of the evolutionist realised the importance of his action when, in the murky depths of some primæval forest, he raised himself laboriously to an erect position, and shambled aimlessly along with his fore-legs hanging idly by his side! Those fore-legs! It is impossible to over-estimate the significance of their being left at liberty. Without them the Farnese Hercules would have remained unquarried and uncarved stone; Palmyra would never have cast the cool shadow of her stately buildings across the hot desert, and the complicated civilisation that exists around us at the present day would for ever have remained in its undeveloped state of primitive economy. Idle and useless those fore-legs may have been in the early days of our frugivorous ancestor's erectility, but the time came when necessity found them their application; and, of all events in the world's history, no one, from its ultimate result, seems to me so deeply interesting or significant as this one event of an ape's fore-legs, emancipated from their earth-service, finding an application. We can only be grateful to the necessity that occasioned their use, and speculate on what that use might have been. Perhaps, hard pressed by some fleeter enemy, he turned at bay, and hurled his missile of stick or stone with black hatred in his sloping skull, and art commenced with the flight of that missile and the mental force that directed it; for he was giving outward expression to the ideal of his mind—the annihilation of an enemy.

Those fore-legs, what have they not done since then? Through long ages have they been trying to express in an outward, visible manner the workings of their owner's mind; and the rude hieroglyphics chipped by the early Egyptian on the tomb of his dead was as much Art as the grand conception of Rubens that speaks to the world from behind the altar of Notre Dame at Antwerp, the question of their difference being, not one of kind, but of culture. We are too apt to narrow down to a few yards of canvas, a few tubes of colour, and the pet tenets of some particular school a principle that is the very foundation of human life—conscious expression with a specific object, or Art.

Thought may take many ways of making it self-ponderable, and the artist who thinks expresses himself in the medium best adapted to his nature; blind Milton and deaf Beethoven were artists giving outward expression to their lofty thoughts, the one in the printed page, and the other in the musical score. Any means of expression becomes Art, and the user of it an artist, whose *status* is determined by the importance of his conception and the legibility of its expression; for it is a great truth that, when some thinker confronts us with an urgent lesson or lofty ideal, be he artist in word or colour, we forget to be critical. Touch but our sympathies, and the dry husk of cherished canons falls from us, and, because of their eloquence, we forgive them their trespasses against some small rules we had framed for the cultured expression of their idea. Had Carlyle been a painter, he would have been a law to himself in painting as in letters: yet the man's mission to men would have spoken so dominantly in his pictures that we should have loved his irregularities and cherished them, as we now do his rugged use of the English language.

Two broad and, as it seems to me, sufficiently comprehensive divisions have been made in Art—the Useful and the Fine. To either one of these we can ascribe all human endeavour; for, as a careful thinker has well said, "All departments of life at the present day—Trade, Politics, Letters, Science, or Religion—seem to feel and to labour to express the identity of their law. They are rays of one sun; they translate each into a new language the sense of the other." But under the influence of civilisation the Useful merges imperceptibly into the Fine; or rather, Culture, seeing the coldness of bare Utility, seeks to overshadow its realism by the beauty of the Ideal. The woodland aisle or hewn catacomb was a sufficient home for the simple creed of the early Christian; but when, in the progress of time, that creed grew to be the ornate liturgy of the Romish and Greek Church, it was housed in the sumptuous Gothic minster. Hence do works of art become also a history of the Culture of mankind, "They denote the height of the human soul in that hour." The rude idol of the Indian, sheltered under its canopy of bark, bespeaks an imagination of the Deity less cultured than the elaborately carved and splendidly sheltered god of the Hindoo.

GEORGE T. HARRIS.

(To be concluded.)

Our Editorial Table.

BROMIDE ENLARGING AND CONTACT PRINTING, AND HOW TO DO IT.

By the Author of *Lantern Slides: How to Make Them.*

(London: The Fry Manufacturing Company, 5, Chandos-street, W.C.)

NOT the least attractive feature of this neatly printed little volume are the admirably clear and self-explanatory illustrations with which the text is interspersed. The Author betrays a complete grip of his subject in almost every line, and writes with such directness and lucidity that the instructions he desires to convey cannot fail to be comprehended by even the least experienced amateur. It is, indeed, as complete, intelligible, and succinct a guide to bromide enlarging as either the professional or the amateur photographer could desire. After discussing the advantages of the bromide process, and combating imaginary difficulties, the author deals with the choice of a paper, the factors influencing exposure, the kind of negative desirable, the apparatus, how to ascertain correct exposure, the fittings of an enlarging room, vignetting, printing in skies, enlarging by artificial light, development, dodging, toning, mounting, and finishing, &c. The pages on vignetting, printing-in skies, and mounting and finishing, are alone worth the small sum (6*d.*) which is charged for this very practical and comprehensive little manual.

FALLOWFIELD'S PHOTOGRAPHIC ANNUAL, 1892–3.

THE volume before us is, in all probability, the largest of its kind in existence. It occupies nearly 600 pages, and is illustrated by over 800 engravings. Truly, a mammoth catalogue! It would puzzle one to name any photographic article in current photographic demand that is not particularised in the *Annual*, which is a monument of commercial enterprise and industry. The hints and formulæ included therein are likely to be of considerable service to the amateur, and, take it altogether, the *Annual*, which as heretofore is well printed and got up, is a production of which Mr. Fallowfield may be proud.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 11,090.—"Improvements in and in Connexion with Photographic Shutters." A. L. ADAMS.—*Dated June* 13, 1892.

No. 11,149.—"Improvements in Plate-changing Devices for Photographic Apparatus." Communicated by Dressler & Heinemann. W. P. THOMPSON.—*Dated June* 14, 1892.

No. 11,175.—"Improvements in Photography." H. VAN DER WEYDE.—*Dated June* 14, 1892.

No. 11,253.—"Improvements in or Relating to the Manufacture of Photographic Films and Plates." J. B. B. WELLINGTON.—*Dated June* 15, 1892.

No. 11,254.—"Improvements in or Relating to the Manufacture of Sensitised Films for Carbon Printing." J. T. CLARKE.—*Dated June* 15, 1892.

No. 11,267.—"An Improved Dish for Use in Photographic Development or other process." H. RAYNER.—*Dated June* 15, 1892.

No. 11,379.—"Improvements in and Connected with Hand and other Photographic Cameras." A. P. RILEY.—*Dated June* 17, 1892.

No. 11,609.—"Improvements in Mounting and Framing Photographs and the like." G. HAINES.—*Dated June* 21, 1892.

No. 11,739.—"Improvements in or relating to Photographic Cameras." J. R. C. GALE.—*Dated June* 23, 1892.

No. 11,867.—"Improvements in the production of Coloured Pictures, or like representations, by the aid of Photography, and in Means or Apparatus employed therein." G. T. TEASDALE-BUCKELL.—*Dated June* 25, 1892.

No. 11,869.—"Improvements in and relating to Portable Cameras." V. DUNKERLEY.—*Dated June* 25, 1892.

PATENTS COMPLETED.

IMPROVEMENTS IN PHOTOGRAPHIC CAMERAS.

No. 14,648. ARTHUR RAYMENT, 99, Hatton-garden, London, and GEORGE LYONS, 19, Somerset-street, Portman-square, London.—*May* 28, 1892.

THIS invention relates to improvements in the ordinary photographic camera, which is made to fold up and lay closely together, so as to pack away easily, and only occupy a small space, such camera being usually mounted upon a tripod stand, as is well understood.

Our present improvements consist in so constructing, arranging, and mounting the "front," or part carrying the lens, that such front can be readily and entirely detached from the baseboard, so as to be easily folded up, and also can be readily attached in the desired position on the baseboard when setting up the camera for use, thus greatly expediting the operation.

For this purpose we arrange a hinge-pin or hinge-pins on the lower part of the detachable "front," and these pins (or pin) engage in eyelets or holes correspondingly formed to receive them in or on the baseboard.

This hinge-joint may be of any suitable character (and the parts, when thus hinged together, may be kept in the desired position by means of any suitable spring or springs or other equivalent appliance); for instance, the joint may be made after the manner of the well-known bayonet joint.

Furthermore, the front may be supported by an adjustable "strut," on one or both sides thereof, and the "front" being movable backwards or forwards (out of the vertical line if desired) upon its hinge-joint, can be firmly fixed in any desired position by the said adjusting struts, and the back being also adjustable as usual, our present improvements thus afford increased facility in operating with the camera as well as in speed in setting up and folding, and effects considerable economy of the space occupied by the folded camera, as by our present improvements we are thereby enabled to make such camera very compact.

A spring bolt, or spring bolts, may be arranged and mounted on the detachable front to engage with corresponding eyelets or slots in or on the baseboard (or *vice versâ*) formed to receive said bolts, such as in a similar manner to an ordinary door latch. Such bolts being thus self-engaging, and the slots, &c., to receive same, may be arranged in two or more separate positions, so as to readily set up the front at a greater or less distance from the focussing screen as desired.

AN IMPROVED MAGNESIUM LAMP.

No. 4999. EMIL WENIG, *Dresdenerstrasse*, 90, Berlin, Germany.—*June* 4, 1892.

This invention has reference to a construction of magnesium lamp whereby light or illuminating effects can be produced suitable for various purposes, such as taking photographs, for signalling purposes on ships or other places, and for theatrical purposes. The lamp can be used to produce lightning-like illumination or flashes or a constant light, the light obtained producing a more powerful effect than the electric light; and can advantageously be used for the purpose of giving signals, instead of other means heretofore used for this purpose, such for example as the foghorn, which is often deceptive as a signal. Magnesium, without admixture of explosive substances, is employed as the illuminating or flashing agent.

PROCESS FOR PRODUCING COLOURED PHOTOGRAPHS.

No. 6342. VICTOR MATHIEU, 9, Agincourt-road, West Hampstead, London.—*June* 4, 1892.

ACCORDING to this invention I produce, by the aid of the sunlight, or of strong artificial light, photographic negatives of such a character that prints made therefrom on sensitised paper, glass, gelatine film, thin skin, or other suitable material, shall be capable of receiving colouring in such manner as to resemble perfectly the objects photographed.

When working by the sunlight, in order to produce a suitable negative, I place in front of the object or in front of the sensitive plate a sheet of transparent glass of a blue, yellow, or red colour, according as the object contains much of blue, yellow, or red colour. These coloured glass screens have such an effect upon the coating of the negative that the print subsequently made therefrom can receive the corresponding tone or colour, or is rendered orthochromatic. I obtain in this manner a negative of a general grey tone, from which a paper print, when properly treated, will allow all the colours to pass or show through which belonged to the object photographed. The negative is developed and fixed in the usual manner by means of ferrous oxalate and hyposulphite of soda respectively. When working by strong artificial light, such, for instance, as the electric light, I project upon the object by means of coloured transparent glass, rays of blue, yellow, or red light corresponding as the object contains much of blue, yellow, or red. I develop and fix the negative in the usual manner, viz., by means of oxalate of potash, sulphate of iron, and bromide of ammonium, and by means of hyposulphite of soda respectively.

The paper or other material well albumenised is, for the purpose of my invention, quite immersed in a silver bath of about fifteen per cent. strength. The paper should be white and not toned, and should be an inch or two larger all round than the negative. After about five minutes' immersion I dry it in the dark, and then use it for printing from the negative. I put the print into a chloride of gold bath of usual character, and leave it in the bath until it assumes a black print or neutral tone. It is then fixed by hyposulphite of about ten per cent. strength, whereupon it is washed in water for several hours in the usual manner. The print is then put in a white blotter, and while still damp glued on to a wooden frame.

When quite dry by exposure to the air I coat it rapidly on the back with pure alcohol for the purpose of coagulating the albumen. When the alcohol has evaporated I coat it on the back with a liquid consisting of white Venetian turpentine mixed with pure alcohol, or with essence of turpentine, the proportion being by preference about half of each.

The print is then immediately placed in a suitable stove, by preference heated by means of methylated spirits or by gas, and which may suitably be of the form presently to be described. In this stove the print is heated to about 50° Cent. According to the difference in the quality of the sensitised paper, one, two, or three coats of the solution may be applied with stoving after each coating, but these stovings should be at a less heat than the first stoving—that is to say, at about 30° or 40° Cent. only. For very thin paper, one coating is generally sufficient. After about six to twelve hours' total stoving, the paper is dry and very limpid. The image is now more clearly visible on the back than on the front face of the paper, and it has acquired permanency because the stoving has reduced all the salts.

Before the colours are applied I give the back of the print a light varnish of isinglass, or, by preference, of a saturated solution of gum arabic with one-third of sugar candy added, to form an insulating surface, in order that the colours may not, by penetrating to the front, alter the transparency of the image. When this varnish has dried, I apply to the parts required on the back of the print by means of a brush, a palette knife, or a pad, the colours of the object photographed. The varying depths of tone in the print modify the effect of the colours seen through them. I only use oil colours or spirit colours. For retouching, if desired, I use colours and dyes dissolved in alcohol; these do not leave a trace of their presence on the image.

The print is now detached from its wooden frame, and may be mounted on Bristol board, on a suitable fabric, or upon a panel or board of some suitable material. It may then, if desired, be varnished with a good copal varnish, but I prefer that of Soehnée's manufacture. The stove may, as stated, be one heated by spirits or by gas, and of a square section.

When employing gelatine films I dry the various coats in a dry room without using stove heat, but my invention is not so useful for such films.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—1. The combined process for production of coloured photographs, consisting of the following successive operations, viz., the preparation of the negative for rendering it orthochromatic, the developing and fixing, the printing therefrom on paper or other material, previously prepared as described, the toning of the print in the chloride of gold bath in the manner described, the usual fixing and washing of the print, the coating or coatings with the solution for rendering the print transparent, the stoving or air drying operation or operations, the coating with the gum arabic solution or isinglass solution, and the colouring of the back, with or without the final retouching, substantially as set forth. 2. The application in the aforesaid process to the back of the transparent print of the gum arabic solution described.

IMPROVEMENTS IN CONNEXION WITH ARTIFICIAL LIGHT PHOTOGRAPHY.

No. 8145. CHARLES EARP ELLIOTT, 36, Jewin-street, Aldersgate-street, London.—*June* 4, 1892.

THE object of my invention for improvements in connexion with photography, taken by the aid of artificial light, is to provide a method and means for obviating or preventing the occurrence of deep, heavy, and decided shadows upon the picture, as obtains with the systems hitherto employed, and I attain this by the employment of a device or devices whereby the rays of light from the source employed are deflected and reflected, and generally diffused around and about the sitter or object to be photographed, so that only such shades or tints exist as tend to beautify the picture.

My invention consists of a portable tent or canopy, in one piece or in sections, and when placed together ready for use may be of any shape or size desired, but, preferably, rectangular, and not larger than is necessary for the purpose, the inside of which, or such part or parts thereof as may be desired, is, or are, lined or otherwise provided with a white or other light-tinted surface, adaptable, from a photographic point of view, as a surrounding for the sitter or object to be photographed. The artificial light employed may be any of those well known to the profession by which the most actinic effect can be produced, but I prefer to use that obtained by the combustion of magnesium ribbon, and a strip or strips of this is, or are, arranged or disposed within a suitable screen or shield, preferably semicircular in horizontal cross section, the flat side or base of said semicircle being the open or front part thereof, and coving said opening, and attached to such screen or shield by any convenient means, I provide an elongated surface having a central opening, through which the rays of light from the burning ribbon are reflected by the inner surface of the screen, this being painted or otherwise coated with a white, or other light-tinted surface, dull or glazed, as may be desired. Upon the said angulated surface when fixed upon the screen, I hinge or otherwise pivot, so as to cover the opening or aperture therein, and suitable number of louvres, but preferably four or thereabouts, each of which may be rendered adjustable to any angle by means of chains, supports, or quadrantal suspenders, or any other convenient means. The said surface and the louvres thereon may be painted distempered, or otherwise coated with a white or

other suitable flat tint, but preferably the former, and the apparatus so constructed may be mounted upon an adjustable tripod, or other stand capable of permitting the apparatus thereon to be raised, lowered, turned, or placed in any position desired, and the whole may then be suitably disposed within the aforesaid tent or canopy, at either side of the camera, and more or less facing the sitter or object to be photographed; and by a suitable arrangement of the apparatus and its accessories, to be hereinafter fully described, the light may thereby be deflected and reflected upon any part of the interior of the tent or canopy, or upon other reflectors or louvres suitably disposed therein, so that the light may by them be caused to expand, spread, or circulate, or be condensed, concentrated, or located, or otherwise diffused around and about the sitter or object in any desired manner for obtaining the best effect at the discretion or will of the operator.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
July 4	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 4	Halifax Camera Club	
,, 4	Peterborough	Museum, Minster Precincts.
,, 4	South London	Hanover Hall, Hanover-park, S.E.
,, 4	Stereoscopic Club	Brooklands Hotel, Brooklands.
,, 5	Exeter	College Hall, South-street, Exeter.
,, 5	Glossop Dale	Rooms, Howard-chambers, Glossop.
,, 5	Herefordshire	Mansion House, Hereford.
,, 5	Lewes	Fitzroy Library, High-st., Lewes.
,, 5	North London	Wellington Hall, Islington, N.
,, 5	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 5	Rotherham	
,, 5	Sheffield Photo. Society	Masonic Hall, Surrey-street.
,, 5	York	Victoria Hall, York.
,, 6	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 6	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 6	Putney	High-street, Putney.
,, 6	Southsea	
,, 6	Wallasey	Egremont Institute, Egremont.
,, 6	West Surrey	St. Mark's Schools, Battersea-rise.
,, 7	Brixton and Clapham	Gresham Hall, Brixton.
,, 7	Leeds Photo. Society	Mechanics' Institute, Leeds.
,, 7	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 7	Oldham	The Lyceum, Union-street, Oldham.
,, 7	Tunbridge Wells	Mechanics' Inst., Tunbridge Wells.
,, 8	Cardiff	
,, 8	Holborn	
,, 8	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 8	Maidstone	"The Palace," Maidstone.
,, 8	Richmond	Greyhound Hotel, Richmond.
,, 8	West London	Chiswick School of Art, Chiswick.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

JUNE 28,—Technical Meeting, Mr. William Bedford in the chair.

THE SANDELL PLATES.

Mr. H. CHAPMAN JONES (the Hon. Secretary) said that he had written to Mr. J. T. Sandell (Messrs. R. W. Thomas & Co.) in connexion with the subject of the evening, and he had sent a number of prints, &c., in illustration of the properties of the new Sandell plates, with which it was claimed a great latitude in exposure could be had. Mr. Jones said he had himself made some sensitometer tests with the plates, which showed a far wider range of gradation than any others he had tested.

Mr. J. CADETT said there was no doubt that one could over-expose the Sandell plate much more in proportion than any ordinary plate, and still get a good printing negative. He did not think the prints sent showed the quality of the plate in any way at all. He knew the plates had the good qualities claimed, as he had tested them. With an ordinary plate very heavily coated they could get gradation far beyond the power of any ordinary printing paper. Messrs. Hurter & Driffield in their tests had found that an increased range was obtained with a heavily coated plate. With such a plate the limit was soon reached where the high lights could not be printed through. They were, in fact, limited by the paper. On a transparency they would get far better gradation. It was surprising the little range there was in an ordinary print—the negative was more perfect than the print. If he were going to considerably over-expose he should certainly use the Sandell plates.

The CHAIRMAN asked if there was any special advantage in having a slow emulsion underneath a rapid one?

Mr. CADETT thought the idea must be good—it was a good quality in a plate.

Mr. W. E. DEBENHAM said a good many experiments had been made years ago in mixing emulsions of different rapidities. How would that result as regards gradation?

Mr. J. D. ENGLAND said less gradation would be got in mixing emulsions.

Mr. CADETT also thought density would be apt to be lost. It was supposed that one would get a result the mean of the two, but the result favoured the slow emulsion.

Mr. ENGLAND thought much depended on the exposure.

REVERSAL, &C.

Mr. DEBENHAM observed that he had not been able to put off the point of reversal by any variation of development, and asked for the experience of others on the point.

Mr. E. CLIFTON had found that when the point of reversal was reached no modification of the developer, even though it were strained to the utmost, would prevent reversal of the image. Mr. Clifton subsequently observed that there was one point in Messrs. Hurter & Driffield's investigations which these gentlemen had not touched upon, and that was the mechanical obstruction offered by the gelatine itself.

The CHAIRMAN observed that Colonel Waterhouse's experiments had proved that reversal could be encouraged; could it also be retarded? Mr. Bolas might perhaps tell them something on the point.

Mr. T. BOLAS, F.C.S., in allusion to a former experiment of his with a bichromated gelatine film, said that the use of bichromate did not so much encourage reversal as tend to make it more definite than it otherwise would have been. If various developers could bring out reversal at various stages, reversal stepped in at varying points of development, and it could be either accelerated or retarded.

Mr. DEBENHAM'S point was that reversal could not be put off.

Mr. BOLAS asked whether a normal negative could be developed with Colonel Waterhouse's sulpho-urea solution?

Mr. CHAPMAN JONES said Colonel Waterhouse had tried and failed.

After further discussion, chiefly of a conversational nature, on the phenomena of reversal and halation, the meeting, adjourned.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 23, Mr. J. Weir Brown in the chair.

Mr. H. Barnes was elected a member.

QUESTIONS.

The following from the question-box was read: "What comparative exposure is necessary for photographing clouds as compared with an open landscape?"

Mr. E. HOWARD FARMER said one-fortieth to one-sixtieth of a second with *f*-8—that is about twice as quick.

The CHAIRMAN had given four seconds with *f*-16.

M. J. S. TEAPE had taken clouds with *f*-32 cap on and off. A very heavy cloud required as much exposure as a landscape.

Question: "Given two lenses, one of six inches focus used on a quarter-plate, and another of twenty inches focus used on a 15×12 plate, worked both at *f*-8—would the exposure have to be the same?"

Mr. P. EVERETT thought the ratios in both cases were somewhat different.

Mr. FARMER said that the shadows, or relief of the subjects, had a variation of from one to ten.

Mr. W. E. DEBENHAM said there would be less light in the corners of the pictures, but, as far as the subjects went, there would be no difference.

Mr. FARMER thought that the matter depended entirely on the subject. The exposure might be very different, or might be the same.

Question: "Has any one tried the effect of projecting a picture by means of a lantern on a background suitable for portraiture?"

After some discussion, it was suggested that Mr. Henderson should deal with the subject at a future meeting.

THE SURPRISE HAND CAMERA.

Mr. T. E. Freshwater exhibited and explained the "Surprise" hand camera, which carries six quarter-plate dry plates or films, automatically changed from the outside as rapidly as desired, and without any complication. The plates are held in wooden carriers forming the three vertical sides of a revolving triangular prism, the carrier being double, thus holding a plate on each side. A hand or arm revolves the prism upon its axis, and brings in turn each side parallel to the front of the camera. Before the triangle can revolve, it is essential to move a mask, which holds the plate in position, by means of a rod, underneath the camera, moved towards the lens over the pin, and, having revolved the prism, immediately replace the rod in its original position before exposing the plate. After the front plate has been exposed, the hand is turned round so as to bring to the front the plate No. 2, which was on the inner side of the carrier. The camera is in the hands of Messrs. J. Levi & Co., of Furnival-street.

PRIME FACTORS IN EXPOSING.

Mr. DEBENHAM resumed the adjourned discussion on Mr. Farmer's discourse, and said he thought Messrs. Hurter & Driffield's directions for estimating certain degrees of dulness of light did not go far enough. He had printed a negative in seven minutes which, two days later, was only half printed, although the light looked brighter. As to the value of colour, which Mr. Farmer told them varied as one to one hundred, he asked for an explanation. He could not see the reason for Mr. Farmer's advice to give an exposure in the studio four times more with a large head than with a small, the apertures being the same. Mr. Farmer had perhaps given the æsthetic rather than the photographic reason.

Mr. A. Cowan exhibited four negatives, each having the same exposure, but showing a gradnated difference in density produced by reducing the amount of pyro from two grains per ounce in the one case to one grain, half a grain, and a quarter of a grain respectively.

Mr. A. HADDON suggested the presence of moisture and wind as having influenced the disparity in Mr. Debenham's printing experiment.

After some further discussion, Mr. FARMER replied, and said that the object of his discourse had been to consider certain factors in exposing in addition to those given by the actinometers; there was no reason why they should not be taken into account. In estimating dulness as varying from one to four, Messrs. Hurter & Driffield took the altitude of the sun into consideration, but omitted London smoke or fog. The difference in the value of the reflections made an enormous difference in the exposure, a rule which applied to the case of large and small-sized heads.

North London Photographic Society.—JUNE 21, 1892, Mr. W. Coventon in the chair.—After the usual preliminaries, Mr. A. J. Spiller showed some fine prints by the new cold-bath platinotype process, taken from whole-plate negatives, Mr. B. J. Grover a series of hand-camera pictures taken in Cambridge on

Edwards' isochromatic films, and the President (Mr. J. Traill Taylor) showed a new stereoscopic shutter made for him for use at the Convention. The SECRETARY called special attention to the next meeting of the Society, to be held on July 5, when Mr. Howson, of the Britannia Works Company, Ilford, would introduce the subject of *Isochromatic Photography*. A copy of the Ilford *Manual of Photography* had been received for the Society's use, and samples of the Eastman Company's new chloride printing-out paper, received for trial, were distributed to the members. Mr. J. TRAILL TAYLOR then gave a conversational lecture on *Photographic Lenses, Ancient and Modern*, in which he compared the lenses in use by photographers prior to 1865, and about that period, with the lenses now in use, describing fully their principles and construction, and illustrating his remarks by diagrams and by the exhibition of a large number of lenses of all kinds, which were passed round for inspection. The lecture was highly appreciated, and a cordial vote of thanks was passed at its close.

North Middlesex Photographic Society, June 27th.—Mr. J. Stewart in the chair.—In the unavoidable absence, from illness, of Mr. Cherry, who was to address the Society, Mr. Marchant (the President) opened a discussion on celluloid films. After tracing the history of the material forming the support, he dealt with their advantages and disadvantages as compared with glass plates, and came to the conclusion that the balance was in favour of the films, a conclusion which was agreed to in the discussion that followed, in which Messrs. Stewart, Smith, Taylor, Cox, Staveley, Gregory, Barnard, and others took part. Mr. Cox then showed some silver prints of old date made by Mr. England which had retained all their pristine vigour, and also exhibited a curiously old-fashioned printing-frame dating from the 50's. Various other matters of interest having been brought forward, the usual competition of views taken at recent field-days was held, Chesham, Hanwell, and Wanstead being represented. In the last-named Mr. C. D. Gregory received the vote of merit. Three new members were elected. The first meeting in the next half-year will be held on July 11, when Mr. Gill will be in the chair, and a technical meeting will be held. Visitors welcome.

Holborn Camera Club.—June 24, Mr. Fred Brocas in the chair.—A number of slides by Mr. John A. Hodges were thrown upon the screen, including some excellent views of North Wales, Devonshire, Derbyshire, and some figure studies. These were followed by some members' slides of Mr. F. J. Cobb and Mr. N. Baker. A number of slides illustrating the *Detection of Crime* concluded the lantern show.

Hackney Photographic Society.—June 23, Dr. Gerard Smith in the chair.—Mr. HENSLER showed a yellow negative, and asked how to remove the stains. It was said that prevention was better than cure, and sulphite of soda was recommended in the developer. Mr. CAPEL asked how reduction took place on a light fogged plate. It was answered by saying that the silver was equally dissolved. It was recommended that a fogged plate reduced and intensified would give greater contrast. The CHAIRMAN recommended a weak solution. The excursion for Saturday was altered to Carshalton. Mr. Hudson showed cheap dark slides made by Chipper. Mr. GRANT said he had exposed a Sandell plate in the forest. It was dark, under trees, with patches of bright sky showing; used *f*-20, and gave twenty seconds about six o'clock, without getting any halation. The Assistant Secretary distributed samples of Eastman's gelatino-chloride paper. The report, given by Mr. HENSLER, of the Barnet plates (distributed at last meeting), was that they were very good. Mr. BARKER then opened a discussion on orthochromatic plates. The CHAIRMAN said if we looked through a purple glass at a view, we should see the immense amount of reds in nature. These, he said, orthochromatic plates brought out. An ordinary view, taken in average light, may be no better, but in a yellow light there was a marked advantage. Mr. DANDO said *The Million* used a dyed screen to obliterate all colours, but one which gave a relief to print from. Mr. GRANT had used orthochromatic plates for two years, and said in foliage there was a marked advantage over ordinary plates. It was announced that the next meeting would be on Tuesday, July 5, at 206, Mare-street, the Club's new quarters. Visitors are welcome to any meeting. Particulars of membership can be obtained of the Hon. Secretary, 12, King Edward-road, N.E.

South London Photographic Society.—June 20, Ordinary Meeting, the President (Mr. F. W. Edwards) in the chair.—Mr. F. W. Grigg was declared the winner of the award for the best print from a negative on Imperial plates. Mr. JAMES A. SINCLAIR then a paper on *Hand-camera Work*. The lecturer said the use of hand cameras was now becoming recognised, special classes being set aside for their work in recent exhibitions. He was in favour of a camera with a lens of about four and a half inches focus, working at *f*-8, but he usually worked with *f*-11 or *f*-16. The shutter should work in the diaphragm slot, opening and closing right across the lens centre, so that as much light as possible could be admitted during the time of exposure. The changing of plates should take place in the simplest manner possible—*i.e.*, automatically. For development he advocated the use of pyro, getting as much detail as possible, and then strengthening the negative if necessary. Mr. Sinclair's remarks were criticised by several of the members present, and some divergence of opinion was expressed. It was an attendance of forty. Messrs. R. & J. Beck exhibited and explained their "Frena" hand camera, together with some enlargements from negatives made with it. Messrs. Houghton did the same with their "Shuttle" hand camera, showing specimens of work produced by it.

Brixton and Clapham Camera Club.—June 21.—Mr. W. H. Smith, of the Platinotype Company, demonstrated the working of their new cold-bath paper, pointing out the directions in which it was superior to the papers previously made. One advantage it possessed in being amenable to special treatment in cases where local development was desirable. This consisted in the application of glycerine to the printed proof either with a brush or sponge, or even by boldly rubbing it on with the hand. This had the effect of retarding development to some extent, and allowed the development of the print with the brush and oxalate solutions of various strengths. This method was specially applicable to cases where solarisation in the dark parts was to be feared, or where it was desired to render certain parts in a lighter tone than they would appear in an ordinary print. The granularity which would probably make its appearance under these circumstances, were the hot-bath paper used, was conspicuous by its absence, and, what was certainly contrary to expectation, the finished print did not betray by patchiness or harsh outlines that any special treatment had been given. On Saturday, the 25th, the annual excursion to Bexley, by invitation of Mr. Dresser, took place. Ample opportunities for picture-making presented themselves on the farm and by the River Cray. After tea Mr. J. W. Coade, Vice-President, on behalf of the members, asked Mr. Dresser's acceptance of an illuminated address, expressing their thanks for his services as President during the last three years.

Leeds Photographic Society.—The first excursion of the Society should have taken place on the 18th instant, but the weather was so bad that, after sheltering for about an hour, a retreat was made for home. Fortnightly meeting, June 20, Dr. Jacob (President) in the chair.—A set of prize slides were to have been exhibited, but did not arrive. This is the second time this season that this Society has met to see these slides, and been disappointed, and on each occasion the excuse has been the carelessness of a clerk in not booking the engagement. The members scarcely seem able to stand a third disappointment, so it was decided not to trouble the owners of the slides to make another engagement.

Midland Camera Club.—June 24, the President (Dr. Hall Edwards) in the chair.—This was the second of the Elementary Evenings, and there was a fair attendance. The subject was that of Development, and the President gave a very interesting demonstration, using a number of different developers upon negatives he had taken the previous day. Several new members were elected and proposed. By the kindness of the Eastman Company, a sample packet of their gelatino-chloride printing paper was presented to each member present. Much interest was shown in the Club's first outing, which is to take place on the 10th of this month.

Photographic Society of Japan.—May 13, Annual Meeting.—There was an exhibition of work by members and of apparatus during the daytime. Amongst other things were shown a large collection of the most modern apparatus by Mr. R. Konishi; a set of photographs on porcelain, excellently reproduced; a series of fine prints on gelatino-citro-chloride paper, by Mr. G. Brinkworth; and an album of the Tokaido, by Mr. K. Ogawa. The SECRETARIES read their report for the past year, which showed the Society to be in a prosperous condition. Mr. K. OGURA read a paper on *Stripping Gelatine Films*, and gave a demonstration of the process. Afterwards Mr. T. SAITO demonstrated the *Stripping of Collodion Films, and the Applying of them to Wood for the Engraver*. Both demonstrations were highly successful. Mr. C. D. WEST then read a short paper on *A New Toning Process for Silver Prints*. This process is simplicity itself. The prints must be on plain paper. They are printed in the usual way, are fixed, and are then thoroughly washed. After this they are dipped in a solution of sulphuretted hydrogen till they reach the tone wished for. Prints were shown that were of an excellent tone. Mr. WEST said that probably photographers would think that such prints were of necessity the reverse of permanent, but he saw no reason to think so. Sulphide of silver was really the most permanent silver salt he knew of. As a matter of fact, he had failed to make any alteration on prints either by dampness or by the action of light during one year. After this paper was read Mr. W. K. Burton exhibited the action of a very novel form of optical lantern that had been brought from America by Dr. A. H. de Guerville. This apparatus, although occupying little more room than an ordinary limelight lantern, distils its own oxygen and hydrogen substitute as the exhibition goes on. Considering that the gear was in the hands of a lanternist of but slight experience, and that it was tried by him only for the fourth time, it worked with remarkable smoothness. The light was of extreme brilliancy, and the audience seemed to highly appreciate a set of scenes that were projected on the screen.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

"TALBOT ARCHER" AND THE CONVENTION.

To the EDITOR.

SIR,—Your contributor, "Cosmos," makes some grave allegations against Mr. W. Jerome Harrison without advancing a tittle of proof to support them. This is not fair and not just, although, to judge by his recent remarks in your pages on other subjects, such conduct is quite characteristic of "Cosmos." This gentleman may be as ancient and lofty an authority in photographic matters as he sets up to be, but I don't think that he is at all entitled on that account to make such serious charges without at the same time furnishing better proof than mere hearsay.

I know Mr. W. J. Harrison so well as to be certain that he would not seek the cloak of anonymity to hurl untruthful and spiteful charges against the members of the Convention, either individually or collectively, and therefore I am confident he is not "Talbot Archer." Besides, does "Cosmos" think that a man of Mr. Harrison's position could possibly descend to the practice of praising himself in *Anthony's Bulletin*, which is what Mr. Harrison would be guilty of doing if "Cosmos'" allegation were true? I read *Anthony* regularly, and I have long observed that Mr. Harrison's name figures frequently in "Talbot Archer's" English notes. But why is this? Because Mr. Harrison is such a prominent figure in the English world of photography, and is always to the fore in the army of progress. Consequently, "Talbot Archer," as an accurate chronicler of English photographic history, could not, or at least should not, ignore the large part which Mr. Harrison fills therein.

I hope that concurrently with this letter you will publish an indignant denial from Mr. Harrison, and that "Cosmos" will be forced to apologise for traducing him.—I am, yours, &c., BRUM.

June 27, 1892.

HELIOCHROMY.

To the EDITOR.

SIR,—I regret that I am obliged to occupy your valuable space with replies to statements which ought never to have been made.

Dr. Vogel (p. 382) appears to accuse the members of the Committee on Science and the Arts of the Franklin Institute of having acted in ignorance of facts which Dr. Vogel himself knew that I had communicated to them some time before they issued the report indorsing my claims. In the identical statement that was submitted to Dr. Vogel for criticism, I gave due credit to that gentleman for his use of corallin in 1873, and to Becquerel and Du Hauron for their experiments with chlorophyl. Dr. Vogel also certainly knows that Du Hauron never gave up my chlorophyl process in favour of Dr. Vogel's eosine process. Du Hauron never made use of either of the processes referred to, but used chlorophyl according to a method of his own, and eosine according to the method of Colonel Waterhouse.

Dr. Vogel's reminder that he published his alleged "new principle" in 1885 is not pertinent, because my process is quite different in principle and in practice from anything that is possible in accordance with it. I am quite certain that Dr. Vogel's idea cannot be carried out in accordance with the facts which support the Young-Helmholtz theory of colour vision. As a principle of colour selection in the negative-making process, it is utterly indefinite, and as a guide for selecting the printing colours, it is positively wrong as applied to the triple print process.

In reply to my intimation that he quoted the only unfavourable expression of opinion of my process that he had been able to find in print, Dr. Vogel now quotes from *Photography* a remark that had no reference to either process or results. The Editor of *Photography* said he was "somewhat disappointed at the attendance" (at my first lecture), but that "the beauty of the results which were shown, however, was great." Will Dr. Vogel make another search?

Dr. Vogel is also in error when he says that he "acknowledged" the heliochromoscope on page 318. My statement that he had ignored it altogether was strictly true.

Mr. Scott's letter is mostly a repetition of assertions which are sufficiently answered in my former letters. He had not patented anything new except a particular form of single-light lantern for multiple image projection. My system of 1888 gave perfect register, which is impossible with images made in the way Mr. Scott advocated. Pictures of quite near objects in relief will not register sufficiently well if made from points of view even as much as half an inch apart. The subjects which I have been showing in the heliochromoscope would have been complete failures if made in that way. Mr. Scott must use my camera as well as my processes if he would succeed. FRED. E. IVES.

London, June 17, 1892.

ORTHOCHROMATIC PHOTOGRAPHY.

To the EDITOR.

SIR,—Dr. Vogel wishes to make a few corrections with regard to some statements made at the meeting of the Photographic Society of Great Britain, and asks me to send the following reply for publication:—

"DEAR SIR,—You are reported to have said, at the meeting of the Photographic Society of Great Britain of the 15th inst., that I was one of the first to experiment with orthochromatising bromide of silver. Allow me to correct your statement in so far that I was *the first* who made such experiments, and that my results were at first not understood, and remained unconfirmed by other experimentalists in the same subject. My discovery was made in 1873, and it was not until July, 1874, that Becquerel, of Paris, and 1876, when Colonel Waterhouse proved the correctness of my statements, that the matter met with general acceptance from the leading experimentalists of the time.

"With regard to the statement by Captain Abney, that I had said I could not get an orthochromatic plate with an excess of bromide, the statement (made in 1876) had reference to *collodion plates*, and not to gelatine. The statement seems, therefore, to rest on a misunderstanding.

"Mr. Spiller's opinion, that an eoside of silver could be formed when eosine is added to the plain emulsion, is contradicted by most authorities in such matters, foremost by Dr. Eder, who holds that eoside of silver can only be formed when eosine comes in contact with a soluble salt of silver, such as silver nitrate. An excess of bromide of silver is, however, present in every emulsion, which will immediately destroy the eoside of silver by forming bromide of silver. The assumption, therefore, that bromide of silver, on being dissolved by the ammonia present, will form coside of silver, is inadmissible, for the silver has the greater affinity for the bromide than for the potassium, which would have to be formed first; also the other assumption, that nitrate of silver would destroy the erythrosine (tetraiodide-fluorescein) by combination of the iodine with silver, is not correct. I have erythrosine-silver plates one year old in which the unchanged erythrosine is easily recognised by the spectroscope.—I am, dear sir, yours truly, (Signed) Dr. H. W. VOGEL.

"*Berlin, June* 25, 1892.

"Mr. J. R. Gotz, London."

I have nothing to add, but that I am not able to repeat the exact words I used at the meeting, but that it appears to me that I could hardly have used them as reported. That Dr. Vogel first discovered the property of different dyes as local sensitisers is an undisputed fact, which needs no further assertion.—I am, yours, &c., J. R. GOTZ.

19, *Buckingham-street, Strand, W.C., June* 27, 1892.

To the EDITOR.

SIR,—I am awaiting some further information, and shall, next week, be enabled to answer Mr. Edwards' letter very fully.—I am, yours, &c.,

June 28, 1892. J. J. ACWORTH, PH.D.

THE DARK FLASH.

To the EDITOR.

SIR,—During the storm of Tuesday last, I observed an effect that would undoubtedly have produced the much-discussed "dark" flash if reproduced on the photographic plate. It was simply that the colour of the flash was a dull red, relieved against a background of the usual kind when clouds are illuminated with an electric discharge. Probably others may have noticed the same effect and drawn the same inference.—I am, yours, &c. E. DUNMORE.

27 *Glenthorne-road, W., June* 29, 1892.

THE NEW PLATINOTYPE PAPER.

To the EDITOR.

SIR,—I have started working the new platinotype paper, but the results are not promising. The prints appear mottled, although I have followed the instructions most carefully, and have also tried different exposures from the same negative with a like result. The paper was supplied by an agent. Do you think that the paper is to blame, or can you give me any cure for the evil? If you can do so I should be very thankful. I may also state that the pictures are stored, also paper, in a proper calcium tube.—I am, yours, &c., A. C.

June 27, 1892.

[We have had no experience of the failure with the new platinotype paper such as our correspondent indicates, and, therefore, are unable to suggest a remedy. Perhaps the Company would be disposed to come to his assistance, and allow photographers generally to receive the benefit of their advice.—ED.]

EMIGRATION TO THE UNITED STATES.

To the EDITOR.

SIR,—I will be glad if you will inform me what you consider the relative prospects of workers in this country and in the States. I have had some experience in dry-plate factories on this side, and am acquainted with most of the ordinary details of emulsion-making. Do you consider I would get the best chance of doing work by stopping here or by emigrating?—I am, yours, &c., JOHN PARRY.

June 25, 1892.

[Questions such as that conveyed in our correspondent's letter are constantly reaching us. For his information and that of many others we may here state that America by no means offers a better field for photographic enterprise of any kind than this country. We should, therefore, be chary of recommending emigration in any but exceptional cases.—ED.]

SPEED OF PLATES.

To the EDITOR.

SIR,—Mr. Phillips' letter of June 17 is evidently written in a genuine spirit of investigation, and what I have to say in reply is not of necessity antagonistic to his views, nor does it follow that I am adversely interested in criticising Messrs. Hurter & Driffield's method of measuring the sensitiveness of plates. No method will have the slightest chance of being generally adopted by plate makers until it has been adopted as the standard method by a representative committee of the leading society or societies, and when this is done, all makers of exposure instruments and tables will adopt the new standard alike.

Mr. Phillips covers rather a wider field than I did in my letter of May 20, and I shall try to keep within the subject. I entirely agree with his explanation about "subject numbers." As I mentioned in demonstrating my instrument before the Camera Club, "correct exposure" is a mere phrase when applied to a group of objects of various colours, and really means the best *compromise* which can be made between the right exposure for the white or grey objects and the right exposure for the most non-

actinic ones. This compromise is represented by the subject number, 100 in my exposure system, and, as Mr. Phillips remarks, it is fairly representative of most groups of objects usually photographed.

It is because this typical standard object is very far from being white or grey that I object to any scale of *white*-light sensitometers being adopted as a standard. With regard to Mr. Phillips' remark about the "restricted observations" made with a Spurge's sensitometer, and the need to study the behaviour of a plate to many varying amounts of illumination, I must point out that when a plate is exposed to light in a Spurge's sensitometer it is exposed to twenty-four varying amounts of illumination, with just as much accuracy and far more convenience than if it were exposed to a standard light in varying portions for one, two, four, eight, &c., seconds.

If I were to expose two plates of different rapidities in the instrument, and found that in the one case the light which had passed through a diaphragm of *f*·22 had produced the same opacity on the plate as that which had passed through *f*·32 in the other case, I should know that half the amount of light is required to produce this given opacity in the case of the second plate than in the first; or that half the duration of the same light would do the same thing, and I should conclude that the second plate was twice as sensitive to white light as the first.

I do not say that Messrs. Hurter & Driffield's method of "finding the first term of a series of illuminations ever doubling, in which the densities of deposit increase, approximately, by equal differences," is not an accurate method of ascertaining the white-light sensitiveness of any plate, but I strongly protest against its being stated as the only correct method of attaining the same end. I shall defer giving my exact views on this subject until I can give them in a more complete form, as a contribution to the coming problem of a standard sensitometer, which shall give correctly the camera sensitiveness of plates.

I had already adopted Mr. Phillips' suggestion about comparing the speed numbers of the actinograph with the plate numbers for my exposure meter, and in the sixth edition of instructions for my instrument, the following footnote is appended to the list of plate speeds:—"Marion's plates are now marked with a speed number (actinograph), which, multiplied by one and a half, gives the P. number. Thus, Act. 40 = P. 60."

In reply to Mr. Phillips' final query, the photometer I use is the simple one described by Captain Abney, in the latest edition of *Instruction in Photography*. An opacity of eight, lets through one-eighth of the light; an opacity of one hundred, has a transparency of one-hundredth, and so on. As this instrument is quite different from Captain Abney's Sector Photometer, I am unable to give any information as to the value of the figures in the latter instrument, or to say which instrument Captain Abney has used for his published observations.—I am, yours, &c.,

ALFRED WATKINS.

Hereford, June 25, 1892.

THE EASTMAN GELATINO-CHLORIDE PAPER.

To the EDITOR.

SIR,—I see in your issue of to-day that you confirm the good opinion I had formed of the new Eastman gelatino-chloride paper. I wished to have your opinion in using the combined bath. Is there any danger in using it in any way?

I notice the Ilford people condemn it roundly; but it is inconceivable that the Eastman Company should recommend it if there was the slightest danger.

I want to use it, as it saves a bath and a washing.—I am, yours, &c.,

June 24, 1892. G. R. C.

[According to our experience, which of course is brief, there is no danger in using the Eastman Company's combined bath.—ED.]

MARBLE-LIKE STAINS.

To the EDITOR.

SIR,—I notice in report of the People's Palace Photographic Society in last week's JOURNAL, that Mr. G. Kendal, referring to his previous experience of marble-like stains on his plates after developing, said that he had overcome that by putting the plate in water before flowing on the developer. He was, however, still unable to account for it. I might say that I invariably soak my plates before developing, and yet sometimes these stains appear. After investigating (soaking plate and also pouring developer on dry plate), I find the stains are due to insufficient washing, *i.e.*, after leaving the developer, and before putting into the fixing bath.—I am, yours, &c.,

HENRY V. LAWES.

June 27, 1892.

CORRECT EXPOSURE.

To the EDITOR.

SIR,—In photography, as in many other matters, an ounce of practice is worth a ton of theory, and therefore I give due weight to Mr. Watkins' experiments for the purpose of clearing up this matter; and, if my experience agreed with his, would at once admit that there must be some factor left out of account in the theoretical statement of the case which, if taken into account, would reconcile both theory and practice. Mr. Watkins wonders if I have made any definite trials with a view to finding out the truth of this matter, and, to be candid, I must admit that I have not; but, in every plate I expose, I take into account the amount of subject included by the lens on the plate, and so, in a sense, am constantly making a definite trial of the theory, and sometimes I have more nearly realised the exact conditions of Mr. Watkins' experiment, for I have taken two photographs from the same standpoint, with lenses of different focal length, and have varied the exposure so as to give less where the lens of shorter focus is condensing on the plate the larger amount of light transmitted by the larger amount of reflecting surface.

Mr. Watkins excuses himself from "entering into an explanation of the fact *why* a large amount of subject reflects no more light to a square inch of the sensitive plate than a small amount does" apparently on the ground that "it is a question which the opticians have not touched upon." Perhaps, Sir, you, as an authority on optics if not an optician, may think the subject of sufficient value to devote a few lines of explanation to the elucidation of the matter.

With regard to Mr. John Sterry's letter on this subject in your issue of June the 24th, in attempting to show that I have omitted to make allowance for the different area of stops used, he himself omits to take into account the elementary law of optics, that the intensity of the illumination of an object varies inversely with the square of the distance from the source of light; in other words, he forgets that with two lenses of different foci the plate is at a different distance from the stop which regulates the amount of light admitted to the plate, and it ought to be needless to point out that this is one of the factors necessary to be taken into account in regulating the size of lens stops, and in the statement that two lenses are working at the same intensity.

Mr. Sterry's statement should, therefore, run: "In the second case, four times the area of object, giving four times the light, is made to cover the same area of plate as in the first instance; but the stop has been reduced to a quarter of the area, and allows exactly the same amount of light to pass as before." The plate, however, has been brought to half its former distance from the stop, and therefore is four times as brilliantly illuminated as in the first case.—I am, yours, &c.,

June 25, 1892. M. J. MICHAEL.

Exchange Column.

*** No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Will exchange 4s Dallmeyer's patent portrait lens for 2s or 3s ditto and cash.—Address, A. E. & C. FOX, Bradford.

Exchange ship's chronometer in good order for 15×13 modern camera, long extension, with lens.—Address E. F., 156, Loveridge-road, N.W.

Will exchange some canvas scenic backgrounds for imitation rocks and rustic accessories. Cabinet photographs of each background can be sent.—Address, W. HOBBS, The Studio, Saffron Walden.

Will exchange new burnisher, by Vevers, twelve-inch oscillating bar, for good posing chair, with two or more backs, or plush or velvet studio curtain, or offers.—Address, HORTON, Photographer, Caroline-street, Cardiff.

Would exchange THE BRITISH JOURNAL OF PHOTOGRAPHY, 1890 (part bound) and 1891, for half-plate and quarter-plate deal box (12 grooves each) with lock and key, or scales and weights.—Address, SANDERSON, 16, Shaftesbury-avenue, Lower Weston, Bath.

Pearson & Denham's quarter-plate detective camera, six double backs, two finders, tripod, Shew's patent rectilinear and shutter, cost seven guineas; exchange light whole-plate or half-plate camera, or Hughes' Pamphengos.—Address H. A. COUCH, 11, Waterloo-crescent, Dover.

Will exchange half-plate rapid rectilinear lens, Ross No. 2 portrait; 12×10 camera with two double backs; interior and exterior backgrounds wanted, head and body rest; studio camera stand; studio chair with four backs.—Address, H. WAKEFORD, 21, Station-street, Sittingbourne.

Wanted, portrait lens (cabinet), in exchange for fourteen volumes of *Amateur Photographer*, from October 10, 1884, to October 6, 1891, also several shilling publications. Two numbers out of the fourteen volumes missing.—Address, F. ASHELL, 16, Grove-terrace, High-road, Tottenham, N.

Will exchange background of verandah (will answer as exterior and interior), size 8×7 feet, for exterior background, also grand carved table (solid wood, good size), for a rustic accessory suitable for different positions. Photographs exchanged.—Address, W. MORGAN, Graus Pwllheli, North Wales.

Exchange for 12×10 modern outdoor camera, with double slides, or four back chair, seven years' BRITISH JOURNAL OF PHOTOGRAPHY, Seavey's rustic bridge, backgrounds interior and exterior, Ross's wide-angle doublet, 10×8, ditto, whole plate.—Address, W. B., Prospect Villa, Stoke-road, Guildford.

Wanted, backgrounds; will exchange BRITISH JOURNAL OF PHOTOGRAPHY from January, 1890, to December, 1891, and twenty-seven odd numbers. Also *Practical Photographer* from January, 1890, to December, 1891. Also good oil stove, by Rippingille, cost 2l.—Address, H. WELFORD, Graham-street, Penrith.

Answers to Correspondents.

**** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

BELL.—Apply to Mr. W. E. Debenham, 46, Haverstock-hill, N.W.

C. P. W.—1. Probably not. 2. Yes, but starch is generally preferred.

FOG.—There is an article on utilising fogged plates in the JOURNAL for July 3, 1891.

W. J. STILLMAN.—Received. Negatives not to hand at the moment of going to press.

J. C.—Both cameras are excellent for the purpose; the lens named would do for No. 1.

J. PATTERSON (Cavan).—You omitted to forward the concluding portion of your letter.

G. JOHN.—In the volume of the JOURNAL for 1890 you will find a series of papers by Mr. Lyonel Clark on the subject.

CYMRO.—The scratches would in all probability not interfere with the working propertics of the lens. But why not put the point to a practical test?

H. COUCH.—The method is a trade secret, but in all probability preparation of the celluloid surfaces is not essential. Coat them as far as is possible in the same manner as glass plates.

CARMENZ.—1. No. 2. Under-exposure. 3. The developer does not seem to be at fault—that is, with an excess of alkali. Probably you employ the solutions at two high a temperature.

BOGUS.—If the pictures are registered, you have a legal remedy against the man; but, of course, he is not bound to tell you where or how he obtained them, unless the question is addressed to him in a court of law.

GREEN says: "I shall feel much obliged if you can tell me the proportions of ether and spirit to use for thinning transfer collodion as used for developing carbon prints on glass."—Usually, this collodion is made with equal parts of ether and spirit as solvents. But, as in use the ether evaporates faster than the alcohol, the collodion should be thinned with two parts of ether to one of the alcohol.

K. L. (Fallgarh, N.W.P., India) says: "Would you please let me know which of the so many processes for reproduction that are in vogue is the easiest, cheapest, but yet artistic, and which can be worked here without any difficulty? I require about one thousand copies every second or third month of drawings, portraits, &c., which I desire to reproduce myself. I have a fair knowledge of drawing, painting, and photography."—The collotype process would undoubtedly be the most suitable.

MISS H. E. says: "Will you let me know what is considered a fair weekly salary for lady retoucher and book-keeper, several years' experience, hours 9.30 a.m. to 7.30 p.m., living out, an hour allowed for each meal (dinner and tea), work considered by employer good, and averaging about half a day's retouching and half a day's book-keeping, including sending out of all accounts quarterly, some reception-room duties and superintendence of photograph orders and some correspondence?"—We should think a weekly salary of thirty shillings would be a fair remuneration.

CARDIFF says: "Having taken a half-plate portrait of a near friend of mine that is now in India, I have unfortunately destroyed the left eye by letting it get damp; otherwise everything is very good, and, as it will probably be years before we meet again, I would ask you to kindly inform me by what means it will be best to rectify my misfortune—whether to spot the negative or to treat the silver print, also whether to use water-colour paint or pencil?"—It is impossible, without seeing the negative, or a print from it, to judge of the kind of damage, to say the best way of dealing with it. If our correspondent can touch out the defects in the negative, that will be the best procedure, and it matters not whether pencil or water-colour is used, so long as the desired result is obtained. If the injury cannot be remedied in the negative, a print taken before the damage was sustained should be copied, and the new negative utilised.

A. M. M. asks: "1. Where can detailed information be obtained as to the use of a mirror for photographing clouds so as to utilise the polarisation of light? 2. Under what circumstances is the method most effective? 3. What should be the position of the mirror? 4. What kind of mirror should it be? 5. Where can detailed information be obtained as to the use of Nicol's prism for cloud effects? 6. How do the following methods compare as regards cloud effects: (*a*) Ordinary dry plates; (*b*) orthochromatic dry plates, with or without screens; (*c*) mirror method; (*d*) Nichol's prism method?"—Instead of replying *seriatim* to these queries, we shall lump them together in the following remarks:—In this JOURNAL for January 30, 1891, and on page 72, an excellent and practical paper *On the Use of Black Glass Mirrors for Cloud Photography*, by Mr. A. W. Clayden, will be found. In this paper the first four queries are clearly answered. We remember many years ago writing an article on the application of the Nicol prism for this purpose, but are at present unable to give the date of the JOURNAL in which it appeared. When conducting the experiments which led to the publication of the article in question, although our prism was what is usually considered one of large dimensions, yet did we find a serious drawback to arise from the narrowness of the field included, and waited for the advent of one which was said to be at that time in course of construction by Ahrens, and by which a large angle would be included. Circumstances arose which prevented this line of research being prosecuted. In the wet collodion days black glass plates (in reality a very dark purple) were articles of commerce for collodion positives, and some of these were very flat, and polarised the light well. We are unaware whether any of these are now procurable. All our cloud experiments were made with wet collodion, hence we are unable to reply to the sixth query. If this falls under Mr. Clayden's eye, he will probably kindly supplement what we have said.

THOS. BRAMWELL.—With very thin negatives—those wanting in contrast—it is difficult to obtain vigorous prints on albumen paper. Such negatives are also unsuited for platinum printing. Negatives of this class may, however, be utilised with advantage for printing on bromide paper. Strong negatives are not necessary for bromide printing.

PRINTER writes:—"Last summer I wrote you asking for a cure for blisters in silver prints, to which you kindly advised the use of methylated spirit, which I used last year with every success. This season the spirit seems a terrible enemy—the prints I have done with it go quite yellow in about a week; would that be caused by the naphtha in the spirit? I notice in the washing waters after soaking prints in the spirit, that there is a lot of stuff that looks like paraffin, but what it really is I cannot say. My prints have twenty minutes in hypo, they then have about fifty changes of water, are left in running water all night, and have fifty changes in the morning. I use ——'s *non*-blistering paper, or at least, so they guarantee it, but I find it blister up about the size of five-shilling pieces, unless the spirit is used. If you can advise me in the matter I should be greatly obliged. Is there any substitute for the spirit?"—The example sent has all the appearance of an imperfectly fixed print, though that should not be the case with twenty minutes, immersion, supposing the solution is of the usual strength and the hypo of good quality. We can scarcely imagine, without definitely putting the thing to the test that the addition of the petroleum sprit to the alcohol can influence the fixation of the prints.

(*Several other correspondents in our next.*)

BRIXTON AND CLAPHAM CAMERA CLUB.—July 19, *Photographic Apparatus and its Use*, by the Hon. Secretary.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—July 2, Outing to Theydon Bois; Leader, Mr. Pask. 7, *Intensification*. 14, Members Open Night.

MR. JOSEPH PURNELL, Photographic Printer, of New Malden, died on June 23, aged sixty-five years. He was one of the very early photographers, having entered the profession about 1855.

PHOTOGRAPHIC CLUB.—July 6, *The Solubility of Photographic Chemicals* 13. *Photographing Natural History Specimens*. Outing, Saturday next, Stanmore. Train from Euston, fifteen minutes past two; Broad-street, forty minutes past one.

MUTUAL IMPROVEMENT POSTAL PHOTOGRAPHIC SOCIETY.—As there are several vacancies in the above Society, amateurs willing to join are requested to send their names and addresses to the Hon. Secretary, Albert B. Moss, 64, Wood-lane, London, W.

WE are deeply sorry to learn that on Wednesday evening last, on the occasion of the fatal balloon accident at the Crystal Palace, Mr. C. V. Shadbolt (the well-known aeronantic photographer, and son of Mr. George Shadbolt, a former editor of this JOURNAL), who had also made the ascent, met with very serious injuries. At the time of writing the unfortunate gentleman is in a very precarious condition.

As it may be agreeable to members of the Convention going to Edinburgh by sea to travel in company, we have made inquiries as to the best steamer sailing from London on July 9. The *Seamew*, of the General Steam Navigation Company's fleet, which is said to be the largest and fastest steamer on the station, is appointed to sail on that day. A tender leaves Westminster Bridge at noon, calling for passengers and their luggage at the Temple Pier, and Old Swan Pier. Passengers wishing to join the ship direct should be at Irongate Wharf at noon. Those who prefer travelling to Edinburgh by railway may, of course, avail themselves of the tourist system.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The Committee of this Society offer for competition by members of the South Metropolitan photographic societies, at their Exhibition to be held in November, 1892, the following medals:—Silver medal for the best photograph shown, irrespective of size; bronze medal for the second best photograph shown, irrespective of size; silver medal for the best set of six lantern slides; bronze medal for the second best set of six lantern slides. Entrance fee, payable only by non-members of the South London Photographic Society, 2s. 6d. each competitor. Among the rules for competition are the following:—Photographs for competition at the Exhibition shall be from negatives taken since the date the competitor was elected a *bonâ fide* member of one of the South Metropolitan photographic societies. The term "South Metropolitan photographic society" includes any photographic society whose meeting-place is situated within the South London postal district. Any member of the South London Photographic Society who is successful in obtaining an award shall present a copy of the photograph to the Society's album. The date and place of exhibition will be announced shortly. Entry forms can be obtained from the Secretaries of any of the South Metropolitan photographic societies, or of Mr. Chas. H. Oakden, Hon. Secretary, 51, Melbourne-grove, East Dulwich, S.E.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1679. Vol. XXXIX.—JULY 8, 1892.

OPENING OUT THE FIXED STOP OF A LENS.

It may be taken for granted that the maker of a lens is, or ought to be, the best judge as to the largest diaphragm that should be employed with it. Some persons, however, are so constituted as to imagine that they, as the users of the lens, are better competent to decide what suits their special requirements than the manufacturer of the tool. And there is much that may be said on both sides. Our remarks, it may be observed, have reference to that class of lenses, whether single or compound combinations, in which the diameter of the largest stop is smaller, sometimes considerably so, than that of the lens itself, a characteristic usually much more pronounced in wide-angle than in narrow-angle objectives. Such lenses are mostly of a deep meniscus form, which is inimical to the transmission of a large bundle of rays to a focal point, and hence the necessity of limiting the diameter of such a bundle by the agency of a small stop.

The optician, by trial, ascertains the maximum size of aperture that lessens spherical aberration to such an extent as to ensure sharp definition, and he decides upon that as the largest, or fixed, diaphragm in the mount, supplying smaller ones to extend the central sharpness over the whole field, or as much of it as may be thought necessary.

There are some users of lenses who think that the opticians draw, as it were, too fine a line in the determination of the definition; they would prefer a softer, less crisp degree of sharpness, obtainable only by the power to employ a larger aperture, coupled, as this is, with the incidental advantage of a greater degree of rapidity, by an increase in the illumination. We could mention several who are of this way of thinking, amongst them being Mr. Stillman, of Rome, who has just sent us a large collection of negatives, illustrating advantages accruing in his practice from opening the fixed aperture in his concentric lens from *f*-16 to *f*-11, which represents an increase in rapidity of working exceeding one hundred per cent.

For portraiture, especially if the heads are to be moderately large, and also for producing certain "naturalistic" effects in landscape work, this enlargement of the optician's fixed stop confers an undoubted advantage, a doctrine we have many times enunciated; but, when we come to consider that the largest aperture of this particular lens giving crispness (we are judging by our own one) would be more fittingly estimated at *f*-19 than *f*-16, we think that the makers act prudently and in self-defence in not sending them out with larger stops. If photographers were, as Mr. Stillman is, educated to employ their lenses with judgment, then no harm would be done by placing in their hands the giant's power of employing any aperture, however large, they choose; but opticians, out of regard to their own reputations, cannot afford to dispense such a power, for it need scarcely be said that the rank and file of camerists estimate the good quality of their lenses by the sharpness of the pictures produced by them. We have known a lens of undoubted excellence returned on the maker's hands because with full aperture, one of great angular width, it did not cover so sharply to the edges as another of less excellence by a different maker, but having a small central aperture. We, therefore, think that it will commend itself as a prudent step for opticians not to place their reputations at the mercy of babes and sucklings in the art whose knowledge of lenses is, at the commencement of their career, invariably of a low order. It is time enough for them, and even then under protest, to give a larger working aperture than that dictated by their own judgment when such a thing is demanded by one whose knowledge of his requirements, and the conditions under which the power should be applied, render it safe to place such in his hands.

SOME POPULAR IDEAS OF PHOTOGRAPHY.

What photography does and is doing for the progress of mankind in the arts, sciences, and manufactures, is perhaps known only within a small and restricted circle, notwithstanding that the camera and the dry plate have penetrated the homes of so many persons of all degrees of altitude on the social scale. Moreover, the opportunities which the non-photographic public have of correcting certain prevalent and erroneous ideas as to the supposedly narrow field in which modern photography finds its applications are not easily available; and, were it otherwise, it is doubtful if the spirit of inquiry is rooted deeply enough in the minds of people of average intelligence to prompt them to ascertain for themselves the exact position which photography holds in the ranks of latter-day knowledge.

Many people of the class we have just pointed at are, we have observed, prone to draw false conclusions in regard to photographic activity simply from a passing study of the contents of photographers' show-cases, and of the windows of those who make a speciality of retailing the counterfeit presentments of good-looking society ladies, shapely actresses, politicians, actors, members of the Royal Family, and the season's lions. For such as these the achievements of modern photography begin and end in the least important respect in which photography shines—that of shop-window portraiture.

Other persons, again, whom on most counts one is constrained to regard as tolerably well educated and informed, are influenced in the light esteem in which they hold possibly the most marvellous art of the Victorian epoch by a half-contemptuous contemplation of such decaying relics of the primeval era of

photography, as the shabby doorsman, the melancholy itinerants of the open heath, the seaside beach, and the rustic hostelry, and a consequently prejudiced estimate of their cheap and unskilful efforts to cater for their humble clients. Photography to such a class carries with it so strong a suggestion of being the exclusive prey of those known on the other side of the Atlantic as cheap Johns, that, unconsciously maybe, they become fatally unfitted to realise that it has a great and glorious existence quite apart from any such lowly, if not unworthy, surroundings.

A third class, probably as large as the two already mentioned combined, grounds its estimate of what photography is, and is capable of, solely from an observation of the outdoor performances of the ubiquitous amateur, and particularly the exceedingly numerous off-shoots of the race sworn to the devotion of the hand camera.

Superficial observers form by far the larger class of the community, no matter from what standpoint we cast the net; and the same rule applies, as we have endeavoured in the previous paragraph to make clear, in respect of modern photography. It will be evident that the number of people who have only the most confined and incomplete ideas upon the exact part which photography holds in the advancement of human knowledge is extremely large. In all probability, an appreciation of this fact was in the mind of the editor of one of our Parisian contemporaries, when he lately dwelt upon the circumstance that so many amateurs of the present time simply took up photography as a means of recreation, and that between such and the band of earnest workers and investigators in the various branches of scientific photography the utmost possible distinction should be made. But, to be of any real welcome or value to scientific photographers, this distinction should exist in the minds of the cultivated public, a state of things difficult to create, for, unfortunately, lack of appreciation and discrimination between the trivial and the important in scientific matters is a public idiosyncrasy which is not easily eradicated.

Perhaps there is little or no ground for complaint that, as a picture-making art, photography has not, on the whole, failed to secure a fair degree of recognition from the critical and cultivated; but of its far larger and more important accomplishments in the spheres of science and technological industry there is, generally speaking, a most profound ignorance. The enormous aid it has rendered to the astronomer, the biologist, the microscopist, the medical man, and a long list of professors of other sciences which Professor Meldola very effectively referred to in his recent lecture, as well as to representatives of innumerable manufactures and liberal pursuits, is either not perceived, or lost sight of, by those whose estimate of what photography is and does is based simply on the trifling ocular evidences we have enumerated above. Hence they refuse to photography the dignity and esteem which it should surely possess, and ignorant journalists and others constantly fling witless sneers at an art of the highest utility and illimitable possibilities.

Photography has helped to advance many sciences. It has revolutionised engraving, it has aided art and educated those who practise it, it has created several industries and sustained many others, and it has contributed liberally to nearly every section of human knowledge. These and a hundred other things in its favour equally as cogent are not so well and widely known as they should be, a fact we should all bear in mind when next it is our fate to submit to the ridicule and contempt with which a good many otherwise excellent and intelligent people regard photography to-day.

Theoretical Predication of the Powers of Certain Compounds in Developing. — In the *Moniteur Scientifique*, earlier in the year, is a very important paper upon "Reducing Agents of the Aromatic Series which are capable of Developing the Latent Photographic Image," by Messrs. A. & L. Lumière (see page 440). We commend it to the notice of all our scientific readers. A great variety of compounds and their isomers are treated of, and their relations to known developers described. All the "new developers" are alluded to, as also others not yet brought into practice, but which are capable of being utilised for the purpose with a greater or less amount of usefulness.

Decolourising Solutions of Shellac.—It has often been asserted that a solution of shellac in spirit can be decolourised by filtering it through animal charcoal. Such, however, is a fallacy. No such treatment will remove the colour. What has been said with reference to a spirituous solution has also been reiterated with regard to aqueous solutions. Here, again, the suggested treatment is equally fallacious, as all are aware who have put it to the trial. We allude to the fact here because we have on several occasions had letters from correspondents on the subject of their failures, and another is now before us. Apart from decolourisation, aqueous solutions of lac are exceedingly difficult to make clear by filtration, through whatever medium that may be performed.

The Next Solar Eclipse.—In the current number of *Nature* will be found an article giving detailed maps and particulars regarding the solar eclipse which will take place on April 15 and 16 next year. The line of totality will be seen to pass through South America and across tropical Africa. The American photographers will probably photograph from the Chilian district, while, probably, both French and English observers will work from stations on the Senegambian coast. The eclipse will probably be very widely observed, not only because the shadow of the moon passes over such a great stretch of land, but because the phenomena occur at a time when a sunspot maximum is approaching, when the sun's atmosphere will be more disturbed, more striking corona effects observed.

Colour Vision.—The returns issued annually prove very clearly that many of the candidates for the marine service are, more or less, colour blind, that is, they are unable to distinguish between certain colours and others. Now, this defect in vision often exists where it is not suspected. On the other hand, some persons are supposed to suffer from it where it has no existence at all. This sometimes arises from their not being able to name the colours properly, although they can distinguish them rightly enough. Some persons, for example, would call some shades of blue purple, or some shades of green blue, and so with other tints, yet they are perfectly able to distinguish between them all. A writer in a recent number of a contemporary, advocates, as a test for colour vision, the matching of colours without reference to their names. This idea seems to be a good one, if only as a supplementary test.

Election Portraits.—Those professional photographers who acted upon the suggestion we made a few weeks ago with reference to portraits of the local candidates for the new Parliament have, in most cases, no cause to complain. Indeed, some have written, thanking us for the "tip." At no previous election has photography figured so conspicuously as it does in the present. This, to a great extent, is to be attributed to the facilities that modern processes offer for the rapid production of large numbers. "Process blocks" appear to have been the method most generally adopted, for the reason that they could be printed from in the press with ordinary type at a cheap rate. Some of the examples, however, are particularly unfortunate, not so much on account of the quality of the block, though in some instances these have been inferior, as to the printing. Half-tone process blocks require careful treatment and the employment of good paper. The paper and printing adopted for electioneering purposes is not of that high order that would make the best of a delicate half-

tone block, although sometimes we are told the price paid for it would warrant the best results. Alas! for those who have to pay.

The Kew Committee and Photography.—In the last issue, No. 309, of the *Proceedings of the Royal Society*, will be found the report, in full, of the Kew Committee, which treats, *inter alia*, of many subjects of photographic interest. We learn from it that a new and simplified method of taking and comparing cloud photographs has been carried out, particulars of which, with examples of the cloud pictures, have been sent to the various committees interested in cloud photographs. We have no details of the kind of picture, but it would seem probable that, if duplicates could be purchased by the public, photographers would have a very ready means of obtaining cloud negatives, and in greater variety than is now possible. Of course, we are aware that numbers of such negatives of excellent character are now purchasable at the dealers'; but it is evident that, the greater the variety, the less the likelihood of two pictures being exhibited with the same atmospheric effects. We may say that our sympathy is entirely with those who prefer to take their own cloud negatives direct from nature; yet we cannot shut our eyes to the fact that a large and increasing number of photographers buy ready-made cloud negatives.

Lens Testing.—The report states that, "in the preliminary operations necessary to conduct the satisfactory examination of photographic lenses, Major L. Darwin, late R.E., has been associated with Captain Abney, and in accordance with his suggestions, a special camera, capable of working with lenses of four inches aperture, and thirty inches focal length, has been fitted up at the observatory. A photometer, on Abney's principle, has also been fitted for use in the testing operations. A detailed account of the apparatus and methods employed is in course of preparation by Major Darwin for publication. Meanwhile, circulars respecting the proposed scheme of examination and preliminary certificates have been printed, and 200 distributed among the leading opticians, manufacturers, and secretaries of all the best known photographic societies, both at home and abroad, to call their attention to the intended plan of examination."

Stations supplied with Photographic Apparatus.—The report also gives a list of places to which they have sent materials, and thus we learn that the observatories of Aberdeen, Lisbon, Mauritius, Oxford, St. Petersburg, Stonyhurst, the metereological offices of Batavia, Fort William, and Valencia have been thus equipped from Kew. Among other things, a camera and requisite fittings for securing photographs of clouds and lightning have been sent for Mauritius.

Fixing.—In the discussions that have taken place at some of the leading photographic societies on the stability or otherwise of silver prints, the general opinion of the most experienced workers appears to be that more importance should be attached to the fixing of the prints than to their washing afterwards. In other words, a perfect fixing is far more advantageous than a perfect washing—that is, if either of the two operations have been negligently performed. The complete fixation of a silver print is only to be brought about by a prolonged immersion in the hyposulphite solution, which should be freshly made and in good quality, or preferably by the use of a second bath. Unfortunately, however, some prints, such as those printed from feeble negatives on weakly sensitised paper, will not stand this treatment without loss of tone and vigour. A printer in an establishment doing a large business recently remarked to us that, if modern prints were left in a fixing bath of the ordinary strength for more than ten minutes or so, they began to deteriorate rapidly in appearance. This used not to be the case, he said, with prints from the negatives of old made on the heavily sensitised paper used with them. If modern prints will not stand the operation of fixing, how can we expect permanence?

Bad Mounts.—Various causes are at different times assigned for the rapid fading of silver prints; one of the most frequent is the cardboard upon which they are put. It is frequently assumed that if the mounts are free from "antichlor"—hyposulphite of soda—they are safe. This is a mistake, as they may be perfectly free from that impurity, and yet contain such deleterious matter as would seriously affect any silver print put upon them. We were recently present at the unpacking of a rather large parcel of photographic mounts from a Continental factory that may contain no hyposulphite of soda, yet we should say they were quite unsuited for photographic purposes. They had evidently been packed while they were wet, and had "sweated" in transit. They had been perfectly dry on the surface, no doubt, but were damp in the middle, so that when unpacked they had a sour and sickening smell, showing that a fermentation had been set up from the moist paste in the interior of the card. Although the mounts showed no signs of mouldiness, there is no doubt that it would develop itself later on if they were kept in a moist, warm situation. What effect this would have on a silver print our readers need no reminding. Some time back we saw some "wood middles" that were to be used in making mounting boards that had been packed damp, or had become so in transit, that were quite mildewed in the centre of the bales. There is no question that mounts made of such material must sooner or later act injuriously on the silver image.

New Method for Detecting Chlorides or Bromides in Presence of Iodides.—It was only quite recently that we had occasion to describe a new mode for ascertaining the presence of the haloids, and again we have to announce a still further process, which, though bearing a superficial resemblance to plans already published, is quite new and easily carried out with regard to dry plates. Dating from the People's Palace Technical Schools, Mile End Road, Dr. D. S. Macnair writes, that when freshly precipitated moist silver iodide is heated with potassium bichromate and concentrated sulphuric acid no iodine is set free, but the precipitate readily dissolves, forming silver iodate, which is precipitated along with some silver bichromate in diluting moderately and cooling the solution. Silver bromide, when treated in the same way, gives silver sulphate, the whole of the bromide being set free, while silver chloride behaves like the bromide, giving free chlorine and silver sulphate. These reactions furnish an easy method of detecting chlorides or bromides in the presence of iodides. It is only necessary to precipitate with excess of silver nitrate, filter off, and wash the precipitate, and heat it with powdered bichromate and a little strong sulphuric acid. If any chloride or bromide is present, even with a very large excess of iodine, its presence is easily detected by the evolution of chlorine or bromine. Dr. Macnair is at present making further experiments with a view to determine the delicacy of the reaction, and also whether it can be conveniently employed for the quantitative separation of iodine from chlorine and bromine.

ADVANCED PHOTOGRAPHIC WORK FOR AMATEURS.

IV.

To those workers who experience real pleasure in mastering the minutest details of the various operations connected with photography, such as the development of their negatives, and who subsequently print the same themselves, instead of, as many now do, by sending them to some professional to have the work done, there must, of necessity, be a pleasure which is entirely unknown to the amateur of the "You-press-the-button-we-do-the-rest school." Still, even among those workers of the former class, it is but seldom that any of "such are found who even go as far as they might in the way of preparing and sensitising their own printing paper.

The ordinary albumenised and printing papers of commerce are so conveniently and easily acquired from any dealer, that the mere idea of an amateur preparing his own paper is never for a moment entertained. Here, again, however, we have an operation which is fraught with much that is interesting to an enthusiastic worker. Doubtless the ordinary albumenised paper of commerce is now supplied to the public in perfect condition (a condition which no tyro would be able to approach in the attempt to produce such). Still, there are other classes of printing papers than the highly glazed or double albumenised samples, which any amateur may prepare with much success—in fact, a class of paper which it is impossible to obtain otherwise than by preparing such oneself.

Of late years, for the larger sizes of photographs, such as, say, whole-plate and upwards, there has been a distinct advance made in artistic taste by the employment of matt-surface papers, such as bromide or platinotype papers of commerce; and doubtless the last-named, to a very great extent, has taken the place of the good old rough-surface silver paper so popular with workers of the old school of photography.

I have no desire or inclination to discard the use of or deride the beautiful results obtained with the aid of platinotype paper, but I often think it a pity that the good old plain salted paper should have been so unceremoniously set aside by those workers who aim at the production of prints of the very highest degree of artistic merit. No doubt the facilities afforded the public of obtaining ready-prepared printing papers that will keep, and the admirable manner in which the bromide and platinotype processes lend themselves in the way of furnishing neat demonstrations in the matter of enlarging and development before amateur societies, has much to do with their popularity; but, were the heads of our various amateur societies to give more attention to the practical demonstration of numerous almost-forgotten photographic processes, I am quite certain their members would profit thereby. How many amateurs of the present new school of photography ever prepared or sensitised a sheet of printing paper for themselves, or even ever saw such an operation done? And yet this forms one of the most important items in practical photography. I am quite aware that, were all amateurs compelled to prepare and sensitise their own printing material, the number of those who now practise photography as a pastime would soon be reduced to a very small number indeed, because not one in a hundred would take the trouble to go to the extra cost of arranging even for such simple little necessaries as would be required to undertake the work. Others, again, have an idea that such is an operation of much difficulty; and, doubtless, this is true in a measure with regard to albumenised paper, but no worker of ordinary intelligence need hesitate for a moment in preparing and sensitising a supply of plain salted silver paper, the results from which will certainly compare with, if, indeed, not far surpass, the beauty of platinotype or bromide papers.

Admirably adapted for this purpose are the rough-surface drawing papers, such as Whatman's, and, when the samples known as snow-white are procured, an amateur could not select a more convenient paper to try his 'prentice hand upon in the way of preparing his own printing paper.

Let any one, therefore, desirous of undertaking this interesting part of photography procure such a sample of paper, and then proceed to make a salting solution as follows:—

Into a jam-pot place thirty ounces of clean cold water, then add forty-five grains of chloride of sodium and forty-five grains of chloride of ammonium; dissolve, and add forty grains of gelatine; place the jam-pot in a saucepan of warm water till the gelatine is incorporated with the solution; then set aside to cool by pouring the same into a flat porcelain dish of larger dimensions than the pieces of paper it is intended to prepare.

A convenient method for any one to follow who undertakes the sensitising of paper on a small scale is to cut up the paper into sizes slightly larger than the negatives to be printed from, and then immerse singly each piece in the salting solution for at least five minutes. This is best done in close proximity to a good kitchen fire, in front of which the homely "winter dykes" are placed, and, having bent some good-sized pins into the shape of fishing-hooks, attach them by fine threads to the cross bars of the clothes-horse. Each sheet of paper is then one by one removed from the salting solution, and held up at the corners by means of the hooks, and dried somewhat rapidly in front of the fire. When quite dry, they are placed away between sheets of clean blotting-paper, and are ready at any time for sensitising by means of the ammonia-nitrate-of-silver solution, prepared as follows: Dissolve one ounce of nitrate of silver in nine ounces of pure water; take three ounces of this solution, and add to same strong liquor ammoniæ until the oxide of silver formed is redissolved, and the solution again becomes quite clear; then add this to the remaining six ounces of solution. Oxide of silver will be again formed; this must be allowed to settle to the bottom of the bottle, and allowed to remain there. When using, filter off as much solution as will be required; exercise a little care in this, otherwise there will be surface markings on the paper.

We will now suppose it is required to sensitise, say, half a dozen pieces of paper to yield prints from 10 × 8 negatives, the paper being already salted and cut to sizes somewhat larger. Each piece is taken singly, and a pencil mark is made on the back, whereby the sensitised surface may be distinguished. The pencilled side is then laid upon a flat board, and the ammonia-nitrate-of-silver solution is evenly and lightly swabbed on by means of cotton wool or flannel. A convenient way is to employ a piece of glass, about three inches wide, over which are folded two folds of swan's-down flannel. This is first soaked or damped in clean cold water, and allowed to dry before being used in contact with the silver solution. The paper being tacked down at the four corners to the board, a pool of silver solution, in quantity sufficient to well cover the surface of the paper without any violent rubbing, is poured on the centre. The solution is then evenly guided, by means of the swan's down, over the entire surface of the paper, care being exercised that the surface is not roughened, and that the solution is spread evenly. This is best done at night, by means of ordinary gaslight; the paper is then hung up by the pins as before in front of a kitchen fire, or other suitable warm place, and dried quickly. It must be borne in mind that paper so prepared will not keep good for any great length of time; if, however, placed between sheets of clean blotting-paper, it will keep quite fresh for some days; therefore it is advisable only to prepare as much as is required for immediate use.

In printing this paper, it will be necessary to print somewhat darker than is the case with ordinary albumenised paper; when printed, however, the operations are just the same, only a much weaker toning bath is employed, to which I shall refer in my next.

T. N. Armstrong.

JOTTINGS.

"Brum's" hope that, concurrently with the publication of his letter, an indignant denial from Mr. W. Jerome Harrison would appear, disputing my charge that, under the pseudonym of "Talbot Archer," and in a journal published at the conveniently safe distance of some three thousand miles or so, Mr. W. Jerome Harrison had stabbed and derided the Photographic Convention of the United Kingdom and its chiefs in an un-English, unmanly, and unjournalistic manner, was not realised. I do not think "Brum" expected that it would be, for, while he goes out of his way to make himself impertinent and offensive to me, anybody can see that his defence of Mr. Harrison is of that nature which is calculated to make the latter individual pray heartily to be saved from his friends. The fact is, Mr. W. Jerome "Talbot Archer" Harrison cannot—nay, dare not—make the denial for which "Brum," in his malice, asks, for the good and sufficient reason that evidence establishing the identity of "Talbot Archer" with "Mr. W. Jerome Harrison" is far too plentiful to render such a disclaimer anything but the most forlorn and dangerous of enterprises. For the credit and good name of American journalism, I hope that, if he does not mend his ways, this *exposé* will result in the substitution for Mr. W. Jerome "Talbot Archer" Harrison of another English correspondent of *Anthony's Bulletin*; but if, unfortunately, Messrs. Anthony should fail to read these "Jottings," and thus have no opportunity of sending "Talbot Archer" to the right-about, I shall make it my business to keep a sharp eye on his fortnightly lucubrations, with the view of keeping your readers informed of the future goings on of "Talbot Archer." This, of course, assumes, Mr. Editor, that I myself do not meet the deplorable fate of being sent to the right-about from your own pages. [Exactly; so be careful.—Ed.]

I have tried some of the new Eastman gelatine-chloride paper; but as there are several other emulsion papers in the market, and as I wish to remain good friends with the Editor and Messrs. Greenwood & Co., I am not going to say anything about it which would lay me open to the imputation of having smuggled into this column any opinion of a laudatory, or advertising, nature. One thing in connexion with the new paper, however, strikes me as being such a good idea that I ask leave to single it out for mention, in the hope that it will be imitated by other manufacturing houses. I allude to the fact that for the humble shilling one can obtain packets of the paper of any standard size from quarter-plate up to 12 × 10, the aggregate area of the paper in one packet being equal to that of any of the others, larger or smaller. Few photographers would find it difficult to afford a shilling for six, say, 10 × 8 or four 12 × 10 pieces of paper, whereas perhaps, if the paper were only sold in packets of one dozen sheets at the same rate, the inducement to purchase, as well as the convenience, would not be so great.

The process of toning silver prints on plain paper by converting them into silver sulphide, described by Mr. C. D. West at the May meeting of the Photographic Society of Japan, is hardly entitled to be called "new," except perhaps the novelty be the employment of sulphuretted hydrogen instead of potassium sulphide. Of the stability of the image of sulphide of silver, as well as the beauty of tone that may thereby be obtained, there is such a general agreement that I am surprised such a system of toning is not more largely adopted both for transparencies as well as paper prints.

The plate-makers must look upon the Holborn Camera Club with an eye of approval, for, according to the report in the JOURNAL of June 24, the Club had an outing on June 18 to Pinner and Ruislip, "where a very charming afternoon was spent in spoiling plates." But, if the members of the Holborn Camera Club are not capable of utilising dry plates in any other manner than by spoiling them, why go to the time, trouble, and expense of a journey to Pinner and Ruislip, and waste a very charming afternoon in pursuit of that object? Or is this, after all, only a little secretarial joke? If it is, what do the members think of it?

I was pleased to see that Mr. J. Pike discounted the value of mercuric chloride in assisting to remove iridescent stains sometimes produced in ammonia development, a reduction process with potassium ferridcyanide and hypo, such as he indicates, being obviously more rational. The iridescent stains he speaks of are not, I fear, producible by ammonia alone, for I have myself been troubled with them when using sodium carbonate as the alkali. It is, I believe, an undoubted fact that iridescence is usually a sign of age in a gelatine plate, which often does not need the assistance of the developer to make it visible. The worst case of iridescent markings with which I was ever troubled, however, was shown in some plates which had not left the maker's coating room a fortnight. Those plates before development had "gone" to the depth of about an inch round three sides, and, after development, looked like nothing so much as polished metal of a bluish tinge.

The editor, in pointing out the uses of the front combination of a lens of the rapid symmetrical type in allowing of a greater focal length being obtained than when the back combination, as is often done, is used, gives a hint which deserves noting and remembrance. Even were all compound lenses really symmetrical, which as a matter of fact they are not, the circumstance that either the front or the back combination can be employed at will confers a property upon this kind of lens the existence of which is not generally recognised. This is, that the one lens can be converted into practically three objectives of different foci.

I am sure, in saying that we all deplore the lamentable balloon accident at the Crystal Palace in which Mr. Cecil Shadbolt, the worthy son of a worthy father, so nearly lost his life, I am only voicing a general opinion. Both gentlemen have done good work in the field of photography, and are entitled to our warmest sympathies.

COSMOS.

ART: ITS MISSION AND CATHOLOCITY.*

EACH one of us is a curious admixture of Useful and Fine Art; and, as a man's temperament is, so will the Useful or the Fine preponderate, so will his path in life be chosen. With his construction of iron and stone the artist will bridge for his fellow-beings an arm of the sea, or with his palette and brush he will bridge the narrow gulf between the Real world and the Ideal. We are each possessed by this Ideal, consciously or unconsciously, and in working it out we show ourselves artists of great or mean capacity, just so far as our Ideal is essential to the period in which we labour, and just so far as it is made clear to those around us. It may be said that no work of art was ever produced that was not an effort on the part of the artist to translate the conception of his mind into a medium understood by his fellow-beings; but, "in the long way from the eye through the arm how much is lost!" his production will be the replica of his conception just so far as he is a skilful artist. It may be such a complete and luminous translation as shall be its own emancipation from art canons, or it may be a mere catalogue of form and colour. Looking back with critical eyes over the world's history the conviction is forced upon us that the aim and endeavour of Art is to give concrete form to this Will o' the Wisp Ideal. It is Art's one supreme mission in every age to stamp the Ideal of that age in its surroundings; and in the works of art of any period in the world's history we have an unimpeachable witness to the culture of that age and its customs; for to enable each age to make itself ineffaceable seems one of the truest offices of Art.

Yet the work of art can never wholly realise the Ideal of the artist; it can only be an approximation to it, for the artist must ever be hindered by the unpliableness of the medium in which he realises his conception; "but through his necessity of imparting himself the adamant will be as wax in his hands, and will allow an adequate communication of himself." It rests with his education and persistent effort to expand the arc of the pliability of his means of expression; the hammer and chisel of the Egyptian hieroglyphist became, through long use and careful education, the facile medium of the Grecian sculptor; and the painter's brush has become, next to language, the most eloquent of any means of imparting ourselves. To what extent photography can be made available as an art of expression rests with its disciples, yet we cannot look around the walls of any photographic exhibition and doubt that a great future exists for it in this respect. All bold endeavour to utilise photography as a means of conveying an artist's conception should be welcomed and tolerated, as tending to increase the arc of its pliability. Much has already been done in this direction, thanks to those bold spirits who dared the first departures from the mechanical photography of former days, and there are in existence, in no meagre quantity, pictures done by photography before which criticism is dumb, because the conception of the artist has been so clearly imparted as to leave no room for speculation.

When an artist works out his ideal and places it before his fellow-beings by means of the Fine Art in which he works, it is with the reasonable hope that it will afford pleasure or instruction to those who have ideas and views resembling his own; but in all communities of men there will be diversity of opinion and taste. The same landscape, the same human face, the same phase in our social life will be different for you and me by the difference in our temperaments; and, when we have issued to the world our separate interpretations of the evening landscape, the human face, or the social phase, there will be the difference between the two of our individuality, which is a birthright no one can take away from us. The picture that attracts and is full of meaning to one is to another devoid of interest and beauty; yet does that not give him the right to say it should not exist. All works of art that exist have meaning and beauty in them for some one—it is their warrant of existence; it is nothing that their meaning be hidden and their beauty unfathomable to those who lack that sympathy which is the key to their use. "Every genuine work of art," we are told, "has as much reason for being as the earth and the sun."

In conclusion, I would plead for a broader view of Art, and a more liberal appreciation of its functions. Art is not solely pre-Raphaelism, or Impression, but of sufficient universality to include both these phases, and a thousand others beside. It is not the painter only who is an artist, but the musician, the littérateur, the orator, and, if he chooses, the photographer. A work of art is not, or should not be, produced as an exemplification of the tenets of particular schools of treatment, nor should it be a picture-lesson in art rules; for then will it become, what only it deserves to become, a battlefield for vituperative critics. *It should be the closest possible approximation to the conception of the artist's mind that his method of expression, aided by his own culture, will allow.* Then will Art fulfil its mission, as "a wonderful expression through stone, or canvas, or musical sound of the deepest and simplest attributes of our nature, and therefore most intelligible at last to those souls who have these attributes."

GEORGE T. HARRIS.

* Concluded from page 426.

MAGIC LANTERN MATTERS.

[South Manchester Photographic Society.]

ON the present occasion I shall not have much to say about the magic lantern anterior to the introduction of Marcy's Sciopticon (from America) by the late W. B. Woodbury. Of course it is quite true that we had lanterns before the sciopticon, and these were of two types, one for burning oil which was nothing more than a toy—and a poor one at that—quite unsuitable for anything more than showing painted slips on screens very little larger than a pocket handkerchief; the

other was a big clumsy oxyhydrogen lantern, which was chiefly used for Sunday-school meetings, mechanics institutions and by a few private exhibitors and lecturers. We had occasionally a good deal of talk about using the lantern for educational purposes, but there was very little practical work done in this direction; not many amateur photographers made lantern slides, or paid much attention to them in those days. But there were a few commercial firms who produced lantern slides, and the introduction of the sciopticon must have vastly increased their business, for that beautiful little instrument not only filled up the gap between the already existing instruments: it did more, it was capable of taking the place of both; with its two-wick oil-lamp it was possible to exhibit photographs in the drawing-room on from five to six feet and up to seven-feet screens without much trouble, and also by the same instrument, using limelight, the largest screens were just as brilliantly illuminated as by the most ponderous lantern ever constructed; indeed, the sciopticon came at the right time, it was just the very thing that was wanted, and it became so popular as to be almost a part of every amateur's paraphernalia.

I believe it to be a fact that Woodbury did take provisional patent protection for the sciopticon lamp in this country, and that during the first year they were placed upon the market over 400 were supplied, but by an oversight, or we may say neglect, for Woodbury was not a business man, the patent was not completed. Other firms took advantage of this, and very soon placed similar lanterns before the public at a slightly reduced price. I am informed that one firm alone supplied over 1000 of these in the following year. We had not long to wait before several so-called improvements were introduced and patented, but it may be said that nearly all the oil-burning lamps for lantern purposes used to-day are more or less the progeny of the sciopticon.

The sciopticon was originally constructed to burn two one-and-a-half-inch wicks, placed edgeways to the condenser, and with the exception of some improvements in the combustion chamber, made by Mr. George Smith, the present proprietor and manufacturer, it remains in its original state. Some of the so-called improved lamps are made to use three, four, and as many as five wicks, and these up to two inches and two and a half inches wide, either placed parallel, converging, or diverging, and some again take other forms, the intention being to increase the illuminating power.

Now, if it were necessary, I could give my experiences of many years with nearly all these multiple wick-lamps, and down to the latest patent before the public; but, to be brief, I see no advantage in them for the purpose for which oil-lamps are suitable. There undoubtedly is in some an increase in the size of flame; but for lantern purposes a large volume of flame is not required. It is intensity that is necessary, and the intensity must be in the right place, which is the focus of the condenser, and is confined to a very small area, and it can be shown to be a positive disadvantage to have more volume than is required. Then, again, the enormous heat given off by some of these powerful lamps, resembling a roaring furnace, is another very great disadvantage. Added to this is the difficulty to keep the wicks burning evenly, by reason of unequal combustion, for very soon the wicks begin to "fork," one flame gets higher or lower than the rest, the thing begins to smoke, to smell, the light goes bad, and the whole affair has to be readjusted; but with the two-wick lamp there is none of these troubles. It is quite easy to adjust the lamp at the commencement, as not to require the slightest attention for three or four hours.

It has been stated by some amateur lanternists that with So-and-So's or somebody else's lamp they have exhibited ten-feet pictures, and we know there are some gentlemen who are always cleverer than everybody else, and sometimes these gentlemen are so carried away by their enthusiasm as to believe they have done something big, or, at any rate, to tell us so. I can light my dining-room by a farthing candle, but I do not think you would care to be entertained at dinner by such illumination. Then, we have somebody's lamp compared to limelight. Well, of course, we can compare the light of a candle to the electric arc light; but for *equality* of illumination the comparison is a very poor one.

The limit in size of picture shown by any oil lamp is, in my opinion, six feet square where photographs are the pictures, but it is possible to select a few photographs of certain subjects that might be tolerated to seven feet, and perhaps more, but after seven or eight feet the blow-through limelight becomes necessary, and this may be used up to ten or even twelve feet, and after that the mixed jet, with oxygen and hydrogen under pressure, is indispensable. Ether may be used in place of hydrogen or coal gas, but I see no advantage in its use in any way.

The oil-lamp, then, as I have stated, is only suitable up to six-feet screens, and the question comes now, is six feet large enough? The answer to that is, it depends where it is to be used and the size of the audience. I have given a good deal of pleasure to private friends at home by even a less picture, but in a private drawing-room or a dining-room it is not always convenient to fix a six-feet screen, and very often when it is convenient there is either a fire burning in the room or some abominable reflections, that cause a good deal of trouble by interfering considerably with the results. All these objections are dispensed with by using a transparent screen such as I now introduce. In this little waterproof case, not unlike an umbrella-cover, except that it is a little longer, is a roll of a particular kind of semi-transparent paper three feet eight inches wide. The outer end of it is attached by six drawing pins to a wooden lath five-eighths of an inch square, having suitable fittings for attaching to two light stands, also contained in the waterproof case. The screen, as you will see, can be erected on one end of a dining-room table in three minutes; and, if the table is long enough, the lantern can be placed at the other end. The audience sit in front, and I think you will be surprised to see how beautiful pictures look when projected in this way. The reflections from the house-fire do not interfere with the results in the slightest degree. We may even permit a tolerable light in the room, and you may strike a match to light your cigar without seriously impairing the brilliancy of the picture. And, now that all is ready, you see a beautifully illuminated picture three feet six inches square by a sciopticon, and which I maintain is large enough for most private-house exhibitions, or even in a small schoolroom, where the audience is not too large.

I am not advocating small screens in preference to large ones, for all depends upon circumstances; but I do prefer a well-lighted small screen to a large one with inferior illumination, and especially so when we can get to the best position from which to view the pictures; and here another matter may be of interest.

The lanternist inquires what is the most suitable size screen for a certain size room? and the audience ask which are the best seats to see the picture from? To say that the screen ought to be in proportion to the size of the room is the general way of putting it, and to sit about the middle of the room is the usual reply to the best position.

Now, it is an established fact, which was recently demonstrated at the Stereoscopic Club, that the most correct position from which to view any photograph is at the angle at which the photograph was taken. Thus, if we make a picture by a twelve-inch lens, and we wish to appreciate size and perspective correctly, we must view the picture at twelve inches from the eye. To examine it at a nearer distance is equal to it being taken by a longer-focus lens than twelve inches; and to see it at a greater distance gives the impressions of one taken by a shorter-focus lens. Then, if we make quarter-plate negatives by a five-inch lens, to see it correctly we must either use a magnifying-glass or a stereoscope, or we may magnify it by the lantern; but the principle is just the same. If we make lantern slides by contact from quarter-plate negatives taken by five-inch lenses, and mask these down to $2\frac{3}{4}$ inches, as is usual, and then project these slides to 6 feet, we have a magnification of 26 diameters; then 26 by 5 (focus of lens) gives 11 feet. If we project the slide to 12 feet, or about 52 diameters, this, multiplied by 5, will show us that, at 22 feet, we should see the pictures at their best; and, from what has now been said, it will be understood how incorrect it is to make lantern slides which are to be shown in series from negatives taken by lenses of different foci, or what comes to the same thing, is making contact slides from quarter-plate negatives and other contact slides from portions of whole-plate and even larger negatives.

At a lantern exhibition, not very long ago, a series of slides of Haddon Hall were shown. The photographer had used a nine-inch focus lens for most of the exterior views, but for all the interiors a five-inch lens was used. I well remember the view from the terrace steps, showing the main front of the building, with the ball-room windows; and the next view was the interior of the ball-room. It looked so very large, that no person in the world who did not know the architecture could have imagined a room of such dimensions to be contained in the building we had just seen upon the screen. It was as ridiculous as for an architect, to submit unfigured plans of the rooms in a house all drawn to different scales, to fill up the paper, and where the bath-room and the w.c. might be shown the same size as the dining-room, no true idea could be formed from such drawings or such photographs.

A similar misuse in lenses was made by a friend of mine who went to Norway last year; he had a half-plate camera, and a seven-inch rapid rectilinear lens. About half the number of his pictures were taken by this lens, and the others by one of the combinations of the lens only, which would be about fourteen inches focus. He said it saved him the trouble of walking or climbing to places where, say, a

waterfall would have been too small to fill his plate if taken by the seven-inch combination; the result is, that nearly all the waterfalls in Norway, judging from his pictures, are the same size, and no true appreciation of size or distance is possible from his *series* of pictures.

About the artistic side of the question, I am not here to-night to discuss, though admitting there may be circumstances where, on the same size plate, a seven-inch lens will be better than a five-inch, or *vice versâ*, but I repeat, and with emphasis, that the too frequent use of lenses of great disparity in focus for lantern slides is a mistake.

It may be said in conclusion that the focus of the lantern objective has nothing whatever to do with the subject of this communication.

W. I. Chadwick.

CLOUD PHOTOGRAPHY.

Not to trespass too greatly on your space, I will briefly say, in reply to your correspondent "A. M. M.," that further experience has not led me to wish to qualify anything I have said in the paper to which you have referred him, and which gives a full answer (as you say) to his first four points.

As to the use of a Nicol prism, I am not aware of any extended series of experiments in point. The apparatus would necessarily be rather clumsy, and, if a reasonably wide angle of view were required, the cost of the Nicol would be very great, far more than the mirror, and without any corresponding advantage.

Ordinary dry plates and direct exposure may be made to yield good results where the clouds are dense and stand against a clear deep blue sky; but if the sky is hazy, or if the clouds are thin, it is comparatively seldom that the exposure can be correctly timed.

Some excellent pictures have been sent to the British Association Committee on Meteorological Photography which have been taken on orthochromatic plates, but no very trustworthy conclusion can yet be drawn as to the comparative merit of the method. At the last *soirée* of the Royal Society, some beautiful pictures were shown which had been taken at the Vatican Observatory under the direction of the Rev. Padre Denza. Some of these were taken by this method, but without a coloured screen.

I see that M. Angot, in a report presented to the Société Météorologique de France on June 7, says: "The best results are obtained with coloured screens; nevertheless, the ordinary screens are insufficient. The following formula, due to M. Léon Vidal, gives every satisfaction. In a little glass trough with parallel faces, a solution is introduced which has the following composition:—

Sulphate of copper	175 grammes.
Bichromate of potash	17 „
Sulphuric acid	2 c.c.

These are dissolved in from 100 to 500 cubic centimetres of water according to the thickness of the trough and the results to be attained." Lumière's orthochromatic plates are used with this screen.

Dr. Riggenbach directs that exposure (direct) should be so timed and development so carried out that the image of the cloud should appear while the sky remains clear. The faint image thus obtained should then be intensified by the sulphantimoniate method, but that, if half tones are required, some other intensifier must be used.

I must say I am at a loss to see how such a method could yield the beautiful results Dr. Riggenbach has obtained, but it is rash to theorise in such matters, and I have not yet experimented upon it.

One thing I have done is to experiment with *slow plates*. "A. M. M." makes no reference to this method, but he will find it well worth trying. With my black mirror and Mawson & Swan's photo-mechanical plates, or with plates coated with the emulsion the same makers use for lantern slides, I have obtained negatives of the thinnest and most difficult clouds which, for clearness of definition of the cloud forms, could not be surpassed. Negatives taken on ordinary plates by the same method often require intensification, but the slow plate, cautiously developed, gives excellent bromide or transparency prints at once.

Slow plates exposed direct may also be made to give satisfactory results, but the adjustment of stop and exposure I find more difficult than it is with the mirror.

I have not yet been able to make a comparative test of the merit of orthochromatic plates, but I do not think a rapid brand would be found satisfactory. A slow brand would probably give good results.

I am afraid these notes are somewhat hasty and disjointed, but they will show "A. M. M." that doctors differ as to the respective merits of their methods. Probably black mirror, coloured screens, orthochromatic plates, or even slow plates, can, in practised hands, be made to yield equally good results. But the question is, Which is easiest? So far as my experience goes, you could hardly have an easier task than to take a cloud effect with the black mirror and a slow plate. I use a stop *f*-11, and vary the exposure from half a second to perhaps one-tenth, according to the light. Heavy clouds require longer exposure than cirrus, but a little practice will soon give better guidance than any amount of verbal advice.

In conclusion, as Secretary of the B.A. Committee on Meteorological Photography, I should be most happy to give "A. M. M." (or any one else who wishes to take up cloud photography) any further information in my power, or even an opportunity of seeing my apparatus and negatives.

Arthur W. Clayden.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

Edinburgh Meeting.

The Convention proceedings commence on Monday, July 11, in the Hall of the Royal Scottish Geographical Society (kindly granted by the courtesy of the Trustees for the Board of Manufactures), Queen Street, Edinburgh.

Details of Excursions.

Tuesday, July 12.—Melrose and Dryburgh. Leader, Mr. Hippolyte J. Blanc, A.R.S.A. Train leaves Waverley Station at 9.20 a.m., and Melrose on return at 5.59 p.m.; 10*s.* 6*d.* each, including railway fare, admission to Melrose and Dryburgh Abbeys, drive to Dryburgh and back, and luncheon; lunch at the George Hotel, Melrose, at 1 p.m.; drive to St. Boswells at 2 p.m. Full particulars will be posted in the meeting-room on Monday, July 11. At Melrose: The abbey, east and south windows, portion of cloister, &c. At Dryburgh: The abbey, Norman door, cloister court, St. Mary's aisle, Sir Walter Scott's tomb, views on river Tweed.

Thursday, July 14.—Excursion A, St. Andrews. Leader, Mr. J. D. Cox. Train leaves Waverley Station at 9.35 a.m., and St. Andrews on return at 3.30 p.m., arriving in Edinburgh at 5.25 p.m.; railway fare, 4*s.* 8*d.*; lunch at "Cross Keys" Hotel at 1 p.m. St. Andrews Cathedral, St. Regulus' Tower, views in harbour, &c.—Excursion B, Dunfermline, &c. Leader, Mr. J. M. Turnbull. Train leaves Waverley Station at 10.15 a.m., and North Queensferry on return at 3.39 p.m., arriving in Edinburgh at 4.5 p.m.; railway fare, 1*s.* 11*d.* Dunfermline Abbey; Inverkeithing, old houses in street; North Queensferry, views of Forth Bridge.

Friday, July 15.—Excursion A, Dalmeny and Cramond Bridge. Leader, Mr. J. R. Roddick. Coach from Waverley Steps, Princes Street, at 10.30 a.m.; other coaches about every half hour; fare, 1*s.* each way; luncheon, Cramond Bridge Hotel, 1.30 p.m. At Dalmeny: Dalmeny House and Barnbougle Castle, the residences of Lord Roseberry; views in park, including Forth Bridge in distance. At Cramond: Old Bridge, Old Mills, Cramond Ferry, and numerous fine views on river Almond. Members desirous of doing part of this excursion could join in the morning and return to Edinburgh to luncheon, or could join the excursion for the afternoon at Cramond Bridge Hotel at 2 p.m.—Excursion B, Roslin and Hawthornden. Leader, Mr. W. Brown. Coach from Waverley Steps, Princes Street, about 10.30 a.m.; other coaches at intervals during the day. At Roslin: Chapel, exterior and interior views; Roslin Castle from dell; and many fine views on the river Esk, in Roslin Glen, and in the grounds of Hawthornden.

General Information.

Application for membership should be made to the Hon. Sec. or to the Hon. Local Sec. The subscription is 5*s.* per annum, and is due on the 1st of January of each year. Ladies are eligible for membership.

An exhibition of novelties in photographic apparatus will be held at the Hall of the Royal Scottish Geographical Society daily from July 12 to 16 inclusive, between the hours of 9 a.m. and 10 p.m. Members must produce their membership ticket on entering.

The annual meeting will take place at the Hall of the Royal Scottish Geographical Society at 10 a.m. on Wednesday, July 13.

The group will be taken, weather permitting, in Princes Street Gardens on Wednesday, July 13, at noon.

The Royal Hotel and the Waverley Temperance Hotel will be the Convention head-quarters during the meeting.

The dinner will be held at the Waterloo Hotel, Waterloo Place, on Friday evening, July 15, at 6.30 p.m., followed by a smoking concert Tickets, 5*s.* each (including attendance but exclusive of wine), from the Hon. Secretaries.

Members on arrival are requested to enter their names, full address, and where staying in Edinburgh, in the signature book in the hall.

The rooms of the Edinburgh Photographic Society at 38 North Castle Street have been kindly offered to the members of the Convention for changing or developing their plates. The following dark rooms have also

been placed at the service of members of the Convention:—Mr. A. H. Baird's, 15 Lothian Street; Mr. J. Buncle's, 7 Hope Street; Mr. William Hume's, 1 Lothian Street; Mr. James Stuart's, 34 Frederick Street; Mr. J. M. Turnbull's, 6 Rose Street; Mr. T. Haddow's, 2 Maitland Street.

Permission has been obtained to photograph the following places:—Edinburgh from Calton Hill, before 8 a.m.; Edinburgh from Castle, in the afternoon; Sir Walter Scott's monument, any time; Castle from Princes Street Gardens, morning or evening; Castle from Grassmarket, before 9 a.m.; John Knox's House, High Street, afternoon; St. Giles' Cathedral, east end, before 9 a.m.; ditto, west end, after 2 p.m.; ditto, interior.

A Handy Guide to the City and District, with maps by Bartholomew & Son, can be had at the meetings of Convention, price 1*s.* each.

SYNOPSIS OF PROCEEDINGS.

Monday, July 11.—Reception at 6.30. Presidential address at 7.30. Optical lantern and opening of exhibition at 9.

Tuesday, July 12.—Excursion to Melrose and Dryburgh.

Wednesday, July 13.—General Meeting at 10 a.m. Meeting of General Committee at 11. Convention group at 12. Papers (3 to 6 and 8 to 10 p.m.): *Individuality in Photography*, H. P. Robinson; *The Art of Photography in relation to Painting*, A. Burchett; *Amateur Photography in America*, Miss Catharine Weed Barnes; *Orthochromatic Photography IV.*, C. H. Bothamley; *Photography in relation to Medical Record and Demonstration*, A. Pringle; *On the Training of Photographers*, E. A. Howard Farmer; Paper by W. K. Burton.

Thursday, July 14.—Excursions to St. Andrews and Dunfermline. Papers (8 to 10 p.m.): *The Use of the Colour Screen in Landscape Photography*, Charles L. Mitchell, M.D.; *Direct Silhouette Portraiture* (with lantern illustration), J. Cox Cox; *How to look at Photographs*, F. M. Sutcliffe.

Friday, July 15.—Excursions to Dalmeny and Cramond Bridge, Roslin and Hawthornden. Dinner and smoking concert, Waterloo Hotel, at 6.30 p.m.

Saturday, July 16.—Council Meeting at 10 a.m.

REDUCING AGENTS OF THE AROMATIC SERIES WHICH ARE CAPABLE OF DEVELOPING THE LATENT PHOTOGRAPHIC IMAGE.

(*Moniteur Scientifique.*)

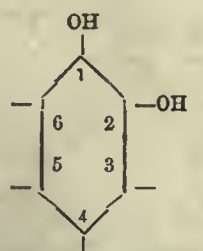
THE authors have endeavoured to apply to photography the conquests of chemistry, and to find a chemical theory for developers; from their observations, the following conclusions have been drawn.

1. For a substance of the aromatic order to be a developer of the latent image there must be in the benzinic nucleus at least two groupings of hydroxyl or two of amidogen, or at the same time a hydroxylic and an amidogenic group.

2. The preceding condition is necessary, but it only seems sufficient in isomerism.

For example, orcine will not develop; its isomeride, toluquinone, develops perfectly. Resorcine indicated as developer has no action in the state of purity. Caffeic acid, however,—

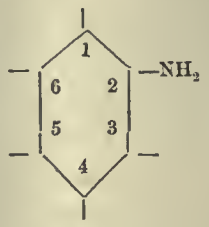
and pyrocatechin,—



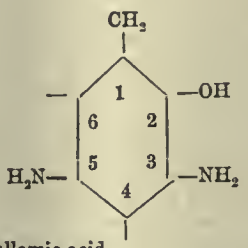
are developers. It is possible that other substances than the isomerides have reductive qualities, but these exist in all cases of isomeric relation.

3. The developing power may persist when in the molecule there are a greater number of groupings OH or NH_2.

Pyrogallic acid was already known; we may also mention diamidophenol,—



diamidocresylol,—



a triamidocresylol; gallamic acid.

4. When the molecule results from the welding of two or several benzinic nuclei, or of benzinic nuclei and others, preceding remarks are only applicable when the hydroxylic groups and the amidogenic exist in the same aromatic nucleus.

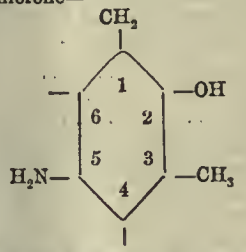
For example, benzidine has no action nor oxycarbostyryles, whereas paradioxyquinoleine acts.

5. The substitutions made in the group OH or the group NH_2 destroy the developing properties whenever at least two of these groups do not remain intact in the molecule.

For example, dimethyl-para-amidophenol does not develop, neither does dimethyl-hydroquinone. Guaicol, however, acts.

6. The other substitutions which may be made in the CH of the nucleus do not seem to suppress the developing power.

For example, hydrophlorone—



Podocarpic acid does not seem to annul the developing power. But the acid function seems to diminish it, for caffeic, protocatechuic, and amidosalicylic acids only develop with a strong base, the alkaline carbonates being no longer sufficient.

7. The preceding remarks only apply to the aromatic series.

Ethylendiamine and guanidine have no action. Phenylhydrazine is an exception; but, on the other hand, this compound is quite outside of the previous rules by its mode of formation.

The following conditions must be added to the above. The substance must be soluble in water, its solution little coloured, and the products of its oxidation in the bath must have little colour and not dye gelatine.

In a note in the June number of the *Bulletin de la Société Française de Photographie* the authors indicate the following formulæ for the application of para-amidophenol to the development of gelatino-bromide of silver.

I.

Water	1000 parts.
Sulphite of soda	200 ,,
Carbonate of soda	100 ,,
Para-amidophenol	12 ,,

II.

Water	1000 ,,
Sulphite of soda	200 ,,
Carbonate of lithia	12 ,,
Para-amidophenol	12 ,,

The first formula is very energetic, and is particularly suitable for instantaneous developments.

The slight solubility of para-amidophenol does not give the latitude in

the formulæ which pyrogallic acid presents, for example. But, *per contra*, the solution is preserved for a long time colourless and active.

Finally, in a recent communication to the French Photographic Society, Messrs. Lumière publish a comparative study on hydroquinone, para-amidophenol, and eikonogen. Leaving aqueous solutions of these three compounds in the air, the para-amidophenol oxidates first, then eikonogen; hydroquinone resists longest.

The product from oxidation of the para-amidophenol, probably quinonimide, is insoluble in water; the solution is not disturbed, but deposits a black soluble precipitate, which turns violet in ammonia or alkali and red in nitric acid.

With eikonogen, the solution is coloured deep brown, turning green in ammonia and red in nitric acid.

Finally, the oxidated solution of hydroquinone is reddish, becomes yellow in ammonia, and is discoloured by nitric acid.

These same products form in developing; those of eikonogen and hydroquinone dye gelatine yellow, which remains colourless in the case of para-amidophenol. At least twenty-five *clichés* can be developed with this last substance without finding any difference from first to last; whereas with the two others, as soon as some *clichés* have been developed, the others turn yellow.

These three compounds reduce soluble salts of silver, but have no action on haloid salts, except in presence of an alkali or alkaline carbonate.

The addition to the developer with para-amidophenol base of bromide of potassium or hyposulphite of soda, produces almost similar effects as with the other developers.

By the Reeb process, to fix the weight of necessary matter to reduce one gramme of nitrate of silver, the authors obtained the following numbers:—

Hydroquinone	0·07
Para-amidophenol	0·14
Eikonogen	0·30

It then requires twice as much para-amidophenol, and four times as much of eikonogen, to reduce the same weight of nitrate of silver. From a practical point of view these differences are of no importance, for the reducing agent is always in great excess as regards the salt of silver. Para-amidophenol, however, seems to present these advantages. It oxidates more rapidly, and, in consequence, is more energetic, and develops more rapidly. The products of its oxidation have no injurious effect on the image or gelatine.

The best proportions are, it seems, as follows:—

Water	500 parts.
Carbonate of potash	40 ,,
Sulphite of soda	100 ,,
Para-amidophenol	8 ,,

A. & L. Lumière.

AN IMPORTANT PATENT LAW CASE.

Skinner & Co. v. Shew & Co.

In delivering judgment in this case, on July 1st, Mr. Justice North said: I have to deal with the thirty-second section of the Act and the cases that have been decided upon it. Looking at those cases, it is clear that if the solicitor of a patentee writes to a person whom he believes to be infringing his patent, and threatens him with an action for infringement, that is a threat which the person to whom it is sent has a right to treat as a threat within the thirty-second section of the Patents Act, and to bring an action to restrain accordingly. He only does it at some risk, because the proviso at the end of that section runs that the section shall not apply if the person making such a threat with due diligence commences and prosecutes an action for the infringement of his patent, and it may be that if a person to whom such a letter is sent treats it as a cause of action, and brings his action upon it, he may find that his ground of action is cut from under his feet by, within a reasonable time afterwards, an action being commenced such as was threatened. That was the very case that arose in the case of the Combined Weighing and Advertising Company *v.* The Automatic Weighing Machine Company, but as a step in deciding that action the first thing decided was that the letter written was a threat. If it had not been so the rest of the decision would have been entirely unnecessary. The law has been so settled ever since the case of the Driffield Company *v.* The Waterloo Warehousing Company, reported in 31 Chancery Division. I found the law so settled, and I had to follow it, and I had in consequence, in the case of Barret *v.* Day, to hold that a letter, which I thought was a perfectly proper letter for a solicitor to write, saying that an action would be brought to restrain the infringement of the patent, addressed to the person infringing, I had to hold that that was a letter which did give a right of action, unless the proviso prevented it. In this case the correspondence which has been put in, is all that we have to consider, and the history of the case is shortly this, that on the 12th of February the Stereoscopic Company wrote to the defendants: "We have had submitted to us, with a view to placing it upon the market, a folding hand camera, which we send herewith. On looking at it carefully over, it struck us that in some points there were faint resemblances to your own Eclipse camera, and, as it would be quite contrary to our desire to in any way infringe upon your patent, we thought it would be very much better to submit it to you, and ask whether you thought it in any way encroaches upon your rights; not that we think it does, but, of course, we are always anxious to act honourably towards any other dealer in the trade." To that the defendants reply to the Stereoscopic Company: "We thank you for your kind letter of yesterday, and, in reply, beg to say that the camera shown is undoubtedly, in our opinion, an imitation of ours, and an infringement. We shall be pleased to see Mr. Humphreys" (he is a member of the Stereoscopic Company) "on Tuesday, as suggested, and shall by that time have taken further advice in the matter." A meeting took place. I have not heard what passed at it, but evidently a letter was promised, for on the 17th the Stereoscopic Company wrote to the defendants: "I have not yet received the promised letter, which places me in rather an awkward position, as we must do something definite in the matter at once. Can you send it per bearer?" "To do something definite," there obviously was replying to the plaintiff's letter, whether they could or could not take any of these cameras, or undertake to put them on the market. Then comes the answer from the defendants to the Stereoscopic Company of the 18th: "In reply to yours of the 13th inst., we beg to confirm our opinion, previously expressed, that the camera in question is an infringement not only of our patent No. 4102, 1885, but also of our No. 15,657, 1891. We have taken further advice in the matter, and are prepared to stop the sale of the camera if placed on the market. If you are willing to do so, it would save time and trouble. If you give us the name of the manufacturer, &c., we will communicate direct with him." That was a letter written deliberately for the purpose of deterring the Stereoscopic Company from completing the proposed agreement with the plaintiffs for them to put upon the market the plaintiffs' camera. It was intended for that purpose, and it was intended to deter them. It was a statement—a *bonâ fide* and honest statement, no doubt; but it was a statement that they were prepared to stop the sale of the camera, and that, of course, means if it was placed on the market by you or by anybody else. Then, instead of furnishing the name of the plaintiffs, the Stereoscopic Company themselves write to the plaintiffs by their solicitors: "The London Stereoscopic Company have consulted us with reference to the proposals for a license under your patent for improvements in cameras. We have also before us the correspondence which has passed between you and our clients." Then it explains the circumstances under which they laid it before the defendants, and they sent to the plaintiff a copy of the letter they received from the defendants, with these words in addition: "Under these circumstances it is absolutely impossible for our clients to continue any negotiations for an agreement. However useful your invention may be, they cannot submit themselves to the risk of a lawsuit. We are, therefore, instructed to inform you that our clients decline to continue the negotiations, at the same time desiring us to express their regret that both you and they should have been put to any inconvenience in the matter. In one of your letters you state that you are prepared to dispute with Messrs. Shew the point. Do you wish us to give them your name in the matter? We shall be glad to hear from you on this point." Then the next letter is on the 20th. The plaintiffs write to the defendants, having seen their letter to the Stereoscopic Company, having a copy of it before them, in which they advised the Stereoscopic Company that if the Stereoscopic Company agree with the plaintiffs, the defendants would bring an action against them, the plaintiff wrote direct to the defendants: "We are informed from the letter which you sent to the London Stereoscopic Company that you intend to dispute our right to make our patent hand camera, of which they showed you a sample. We may say we have taken competent advice from more than one eminent authority, and we are fully prepared to defend any action that you may bring. The only probable result will be the quashing of your own patent through defective specification; in any case we are advised that our camera is clear. We are sorry to have to come to litigation with you, but we are so sure of our ground that we cannot for a moment entertain the idea of withdrawing our camera from the market. We have already a number of them in hand, and these will be on the market directly. We shall be glad to hear from you what steps you propose taking in the matter." Now, the plaintiffs write that, and I must assume as against them that the statements in it were true, as the defendants would have a right to assume. Then the Stereoscopic Company writes to the defendants: "We regret our inability to send you the model of Mr. Skinner's camera, as the matter being at an end between them and us, we have considered it best to send them the models, so that they may remit them to you or not, as they deem best." Then, on the 23rd, the defendants write to the plaintiffs: "In reply to yours of the 20th inst., we can only confirm ours of the 18th inst. to the London Stereoscopic Company that we consider the camera in question an infringement of our patent, No. 4102, 1885, and 5655, 1891, and are prepared to take action to stop the sale. In order that we may go further into the matter before loss of time is incurred, if you would send us a camera, and give us the number

of the patent, it would be an aid to our further investigation of the matter, saving unnecessary delay." Then the plaintiffs' solicitors write on the 2nd of March, and then again on the 8th: "Mr. Skinner has consulted us as to the correspondence which has passed between you as to the alleged infringement by our client of your patent rights. Our client is satisfied that his invention is patentable, and, acting on our advice, he will at once file a complete specification, and leave you to contest the question. We shall be obliged by your informing us on what grounds you consider our clients' invention is an infringement of your patent. Mr. Skinner will also at once proceed to sell the camera which he has invented, and a stock of which he has manufactured." That seems, from the subsequent letter, not to be correct, but of course the defendant had a right to believe that it was correct, and the plaintiff could not be heard to say to him that it was not. I suppose the real explanation is that, although they might not have been finished, that they were nearly finished.

Mr. Everitt: A large number were in course of manufacture, but we stayed our hand in consequence of this.

Mr. Justice North: Then on the 9th the defendants asked for a camera, and on the 11th the plaintiffs' solicitors replied, referring to their own patent of 1885. I need not refer to that part of the letter. Then they say, "We give you notice that we shall issue a writ for injunction and damages on Tuesday morning unless an arrangement is come to for satisfactorily compensating our clients for the damage they have sustained, and unless we obtain from you an undertaking that you will withdraw opposition to the patenting of our clients' invention, and also withdraw your threatened legal proceedings and right to interfere with the manufacture and sale of our clients' cameras." Of course, the defendants were not bound to give such an undertaking as that, but the result was that the letter of 11th of March stayed all proceedings for a couple of months. But on the 16th of May the plaintiffs issued their writ for an injunction to restrain the threats under section thirty-two.

Mr. Everitt: Has your lordship got a copy of the letter of the 16th, in which they say they will accept service of our proceedings?

Mr. Justice North: Yes. Then the matter stands thus. Down to May no proceedings had been taken by the defendants, and the defendants do not ask, and the order I make will have a statement to this effect, that the defendants did not ask that the motion should stand over in order to enable them to bring an action under the proviso at the end of the thirty-second section, and it will also state that both parties, the plaintiffs and the defendants, ask me to treat this as the trial of the action, and to give such relief as the plaintiff is entitled to on the trial, and if I thought that damages could be awarded, to proceed now to direct an assessment of such damages. In my opinion there is a threat within the section having regard to the cases which have decided that such letters are threats. That being so, the result follows as a matter of course. I must grant the injunction worded in the way I have said, and I must refer it to Chambers to inquire whether the plaintiff sustained any and what damage by reason of the threats. Two points were set up particularly by the defendants. It is said that an answer to a question cannot be a threat. I do not see why not. I cannot see what difference it makes whether the threat is made in answer to a question or otherwise. It was a threat that was uttered by the defendants to the London Stereoscopic Company to deter them from dealing with the plaintiffs, and that being so, the fact that it was only given in answer to a question seems to me immaterial. I cannot see that there is any distinction between the defendants answering the question of the Stereoscopic Company from what it would have been if their own letter had been elicited by not a question put to them but by an exhibition in the windows of the Stereoscopic Company of a model of the camera in question.

Mr. Everitt: I have seen my learned friend Mr. Bousfield, and he quite agrees that we should treat this as the trial of the action. He does not ask for the case to stand over, and he submits, if your Lordship thought it right, to an inquiry as to damages.

Mr. Justice North: That has been done. I don't want any undertaking.

Mr. Everitt: Then as to the costs. I should ask your Lordship for the costs of the trial.

Mr. Justice North: Yes.

Mr. Everitt: And the costs of the inquiry, as to damages, will be reserved and dealt with.

Mr. Justice North: Yes: I always reserve the costs of an inquiry as to damages. You can have the costs down to the trial.

Mr. Everitt: If your Lordship pleases.

The plaintiff's solicitors were Messrs. Waterhouse, Winterbotham, & Harrison, of New Court, Lincoln's Inn.

Our Editorial Table.

We have received the catalogue of Mr. W. Hume, of 1, Lothian-street, Edinburgh, which embraces particulars of a large selection of photographic requirements. The catalogue of Messrs. Archer & Sons, of Liverpool, has also reached us. This will also be found useful to intending purchasers of apparatus, &c.

Photographic Enlargements.

By George Wheeler.

This work, which is published at 1*s.* by G. Wheeler & Co., Manchester, deals with the subject of enlargements in a practical and comprehensive manner. Mr. Wheeler in the preface informs us that it is free from any attempt to push some special make of paper or apparatus to the front, and to that extent is unbiassed. Indeed, we perceive, at a first glance through its 130 pages, that it is entirely free from anything of the nature of shoppiness. He divides his work into twenty-four sections, each of them treating of a definite topic, such as "Daylight and Artificial Light," "Exposure," "Developing," "Spotting and Retouching," "The Treatment of Faulty Negatives," "Rough and Smooth Paper," &c. To all who desire sound, practical information on the subject of enlarging we can recommend this manual.

"Photography" Annual, 1892.

Edited by Henry Shumey. London: Iliffe & Son, 3, St. Bride-street, E.C.

As well printed and got up as last year, this bulky annual is otherwise formed upon practically identical lines. The literary contents include, among many other articles of interest, a most useful record of the progress of photographic chemistry during 1891, by Mr. C. H. Bothamley. Mr. Albert Taylor performs a like office for Astronomical Photography, Mr. Chapman Jones for Photographic Optics, and Mr. T. Bolas for Photo-Mechanical Printing. The "selected" articles deal with practical subjects. Interspersed throughout the volume are a large number of excellent collotypes and "process" pictures, while the various sections of the work devoted to commercial catalogue purposes are fully furnished, and a mass of other useful information relating to societies, dealers, &c., is also given. The price of the annual in paper covers is 2*s.* 6*d.*

The *Idler* for July is brimful of amusing reading matter happily illustrated by some of the cleverest authors and artists of the present day.

Our Cruel Patent Laws, by a Liberal Candidate, is a reprint of letters and articles pointing out the injustice of the English patent laws.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 11,922.—"The New Bellows Action for Photographic Camera Shutters. R. Aspa.—*Dated June* 27, 1892.

No. 12,029.—"Improvements in Apparatus for Regulating Photographic Shutters." H. Hill and A. L. Adams,—*Dated June* 28, 1892.

No. 12,097.—"Improvements in or connected with the Production of Images or Pictures, or Impressions on Photographically Sensitive Surfaces, or on such Surfaces after they have been exposed to Light." F. J. Smith.—*Dated June* 29, 1892.

No. 12,109.—"Improvements in Coating Photographic Papers or other Flexible Materials." W. J. Wilson.—*Dated June* 29, 1892.

No. 12,207.—"Improved Apparatus for Spreading Sensitive Materials upon Flexible Supports." S. H. Fry.—*Dated July* 1, 1892.

No. 12,244.—"Improvements in Magic Lanterns." Complete Specification. H. C. Newton.—*Dated July* 1, 1892.

SPECIFICATION PUBLISHED.

1889.

No. 19,897.—"Photographic Films." Communicated by Eastman. Boult.

PATENTS COMPLETED.

Improvements relating to Photographic Cameras, and to Appliances for Changing Plates or Films therein.

No. 12,961. Benjamin Joseph Edwards, The Grove, Hackney, Middlesex. —*June* 4, 1892.

My invention is designed to provide in a more simple and efficient manner than heretofore, for effecting the change of position of sensitised plates, films or paper in photographic cameras, so that any desired number of the sensitised plates or surfaces can be used in succession.

My said invention comprises improved means whereby sensitive flexible films in continuous lengths may be used, the pictures being taken in succession upon a strip of the sensitised material which is wound upon rollers enclosed in a suitable box or case. I use a pair of rollers, which I prefer to make of such diameter that one complete turn thereof shall unwind from one roller a sufficient length of film for one exposure, and shall wind upon the other roller a corresponding portion of such film previously exposed. One of the said rollers is provided with suitable means whereby it may be rotated from the exterior of the box or case. Each of my rollers is fitted at the ends with rims or flanges, and, instead of making the roller to turn on small pivots or bearing surfaces as

is usually done, I make the enlarged ends or flanges of the rollers to rest in suitable bearings in which the said rollers revolve. The large bearings which I use for this purpose are divided longitudinally, and the rollers are arranged to be pressed into the lower halves thereof by a spring or other suitable device so as to create sufficient friction to give the necessary tension to the film as it is unwound from one roller and wound upon the other.

To keep the film constantly and evenly stretched I provide guide-rollers, over which the film will pass in travelling from one to the other of the main rollers. The said guide-rollers may be smaller in diameter than the main rollers, and are placed at such a distance apart as may be required to suit the width of the pictures. I arrange one or more of these guide-rollers to turn in slotted bearings, and the said rollers are held apart from each other by a spring or springs in such manner that, the films being held at each end by reason of the friction on the ends of the main rollers, the portion of the film which is in position for exposure will be kept tightly stretched by the outward pressure of the guide-roller or guide-rollers actuated by the spring or springs.

On the rim or flange of one or both of the main rollers I provide a projection or, preferably, a depression or recess, at one portion of the circumference, so that, when the roller has made one complete turn, it will actuate or permit the action of a spring or lever provided with a point or marker, which, by means of the said spring or lever, is pressed against the film at the end of each revolution of the roller. The mark, line, or dot which is thus produced, serves to indicate the line of division between the separate exposures, and shows where the film is to be cut previous to development. I sometimes connect the said marker with the shutter or with the mechanism which actuates the same, so that the film will be marked as the shutter falls, or is operated for each exposure, or as it is reset after each exposure.

To protect the film from the action of light before and after exposure, I provide each of the rollers, upon which the film is wound, with an improved light-tight covering, consisting of a cylindrical tube of cardboard or other suitable material, which is fitted to turn freely upon the roller, the ends of the latter being recessed to receive the ends of the tube in such manner that no light can pass to the interior of the tube. Each tube or casing is split or cut longitudinally throughout its entire length, and the edges of the slit are covered with velvet or other suitable soft material, with which, if desired, the whole of the interior of the tube may also be lined. In use, the film is drawn through the velvet-lined slit, which is kept close and light-tight by the natural spring or elasticity of the material of which the cylinder is made, or an elastic band may be passed over each end of the tube to keep the slit closed. By these means the film, except such portion thereof as is actually in use, is effectually kept from the light. The rollers, with their casings, may be easily removed from the roll-holder, and carried as light-tight film-packages, which can be inserted and removed from the camera or roll-holder in daylight without fear of injury to the film.

My said invention further comprises improved means whereby sensitive glass plates or films cut into separate pieces may be used, and whereby such plates or films may be rapidly and conveniently changed in the camera without the use of a dark room, and without altering the focus.

For this purpose I use an improved dark slide or changing box, consisting of two or more frames or cases made to slide one within the other, and in which the plates or films are contained. The plates or films are preferably fitted with suitable sheaths or carriers, or are backed with pieces of cardboard or other suitable material, of the proper dimensions. The inner sliding case is made to contain a number of the sheaths carrying the plates or films, and one end of this case is so constructed at both the back and the front as to allow one of the sheaths at a time to pass into or out of the said case. Within the outer case I provide one or more spring catches, hooks or projections, so arranged that they will engage with the edge of one of the said sheaths and retain the said sheath in the outer case, while the sliding case, with the other sheaths therein, is drawn out. When the sliding case is drawn out to the full extent, the engaged sheath is pressed by suitable springs to the opposite side of the outer case. When the inner case is again closed or pushed home, the said sheath passes into it and takes its position on the opposite side of the bundle of sheaths or plates contained in the said inner case. In this manner a succession of plates or films can be exposed, by the simple action of drawing out and closing the sliding case which holds the said plates or films, without removing the dark slide or changing box from the camera. I provide a stop to prevent the complete withdrawal of the sliding case; and to protect the plates from the light I provide a light-tight bag or box which receives the inner case when it is drawn out. For transferring the plates or films from the front to the back of the bundle thereof, I prefer to use two sets of springs adapted to act upon opposite edges of the sheath, and each of which comprises two springs so combined that they will at all times exert an approximately uniform pressure upon the sheath. Both sides of the outer case are provided with sliding light-tight shutters, one of which is so arranged that, when all the plates or films contained in the dark slide or changing box have been exposed, the said shutter may be withdrawn and the sheaths carrying the exposed plates be allowed to drop into an empty case or reservoir, which is also fitted with a sliding lid, and is so constructed that it can be attached to the changing box, and the plates or films can be transferred to it therefrom without exposure to light. The changing box is then replenished from a similar reservoir or case containing unexposed plates or films. These cases or reservoirs are made interchangeable. It is evident, therefore, that any desired number of the plates or films can be used without having to use a dark room for effecting the required changes.

The back of the sliding case is preferably provided with a sliding plate and with suitable catches to engage therewith, so that, when the sliding case is drawn out to shift an exposed plate from the front to the back thereof, the said sliding plate will be drawn out with it. The said sliding plate is so arranged that it will act as a spring to push the sheaths to the front of the sliding case and also hold the plates in the inner case when it is withdrawn. When the sheaths and plates are to be inserted in, or removed from, the dark slide or changing box, the aforesaid catches are disengaged and the sliding spring plate is drawn out without the sliding case.

I find it advantageous to arrange in the outer case a brush formed of velvet or similar material, which will effectually clean the plate or film as the sliding case is pushed inward.

I sometimes so arrange the cases that the inner case will remain stationary and the outer case will be moved to effect the changing of the plates.

My improved dark-slide or changing-box and my improved roll-holder may be made of the same external dimensions, so as to fit and be interchangeable in the same camera, in order that the operator may use either at will. They may, moreover, be fitted to any ordinary camera, which need not be of special construction.

To register the number of exposures as made, I sometimes provide a counter or index, which may be in the form of a figured disc attached to a ratchet wheel, which is moved forward automatically one notch or tooth as each fresh portion of the film is unwound, or each time the plates or films are changed Or I may employ any other suitable registering device.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
July 11	Darlington	Trevelyan Hotel, Darlington.
,, 11	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 11	North Middlesex	Jubilee Hall, Hornsey-road, N.
,, 12	Derby	Smith's Restaurant, Victoria-street
,, 12	Manchester Amateur	Lecture Hall, Athenæum.
,, 12	Stockton	Masonic Court, High-street.
,, 13	Leicester and Leicestershire	Mayor's Parlour, Old Town Hall.
,, 13	Munster	School of Art, Nelson-place, Cork.
,, 13	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 13	Reading	
,, 13	Stockport	Mechanics' Institute, Stockport.
,, 14	Birkenhead Photo. Association	Association Rooms, Price-street.
,, 14	Bradford Photo. Society	50, Godwin-street, Bradford.
,, 14	Hackney	Morley Hall, Triangle, Hackney.
,, 14	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 14	Manchester Photo. Society	36, George-street, Manchester.
,, 14	North Kent	Gravesend.
,, 14	Oldham	The Lyceum, Union-st., Oldham.
,, 15	Cardiff	
,, 15	Holborn	
,, 15	Leamington	Trinity Church Room, Morton-st.
,, 15	Maidstone	"The Palace," Maidstone.
,, 15	Richmond	Greyhound Hotel.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 30.—Annual General Meeting. Mr. J. Traill Taylor (Trustee) in the chair.

The HON. SECRETARY read the annual report as follows:—

TENTH ANNUAL REPORT OF THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

In presenting the tenth annual report, the Committee wish to congratulate the members on the work of the past year. There have been large attendances, and many valuable discussions have taken place, arising out of lectures given and papers read by members and other gentlemen of distinction in the photographic world, amongst others being: *Photographic Perspective*, Mr. W. E. Debenham, and one on same subject by Mr. P. Everett; *Isochromatic Photography*, Mr. B. J. Edwards; *The Lantern Microscope*, Mr. T. E. Freshwater; *A Perfect Emulsion by a New Process*, Mr. A. L. Henderson; *Some Recent Exhibitions*, Mr. P. H. Newman; *The Exaggerated Perspective of Wide-angle Lenses*, Mr. P. Everitt; *Gas Bottles and their Safety*, Mr. F. A. Bridge; *Isochromatic Plates*, Mr. John Howson; *Enlarging Lanterns*, Mr. J. Traill Taylor; *Wet Collodion*, Mr. W. E. Debenham; *Continental Photographic Institutions and their Influences*, Mr. W. H. Harrison; *Demonstration of Photography on Wood*, Mr. W. J. Rawlings; *Collodio-bromide Emulsion*, Mr. A. Mackie; *Wet Collodion*, Mr. Joseph Barker; *The Photographic Study of Clouds and Lightning*, Mr. A. W. Clayden; *The Tele-photographic Lens*, Mr. T. R. Dallmeyer; *Some Prime Factors in Exposing*, Mr. Howard Farmer.

A Drawing-room Entertainment, lantern and musical, was given on February 18 in St. George's Hall, Champion Hotel, by members and friends, to a large audience.

The Lantern Evenings, under the superintendence of Messrs. T. E. Freshwater and G. W. Atkins, have been fully appreciated.

Fortnightly outings have been arranged for the present season.

The library has had many additions, and the work of binding, &c., is being vigorously pushed forward by the librarian, Mr. F. W. Pask.

A contribution of 2l. 17s. 6d., collected from various members by Mr. A. Haddon, was sent to the Maddox Testimonial Fund.

The Association, with the view of assisting the Photographic Society of Great Britain in its efforts to improve the position of the newer societies, became affiliated to that Society, Messrs. P. Everett and F. W. Pask being appointed delegates to represent the Association.

Fifty-four new members have been elected during the year, and there have been six resignations.

Lastly, the Committee recommends that members should still continue their efforts to increase their numbers, the work done by the Association being acknowledged by the highest authorities to be second to none in this country, and the Committee would also take this opportunity of reminding the members that the series of lectures, as proposed by Mr. A. Haddon, our curator, will be commenced in the autumn, and will be delivered by gentlemen of high eminence in photographic circles. When complete, the lectures and discussions thereon will be published, and it is expected that the volume so formed will prove to be the most complete *résumé* up to date of photographic procedure.

Financially, the position of the Association is highly satisfactory, all liabilities are settled, and there is a substantial balance in hand largely in increase of that of the last financial year.

Mr. WILLIAM BEDFORD, in moving the adoption of the report, thought they might congratulate themselves upon it. He spoke, perhaps, with as little bias as anybody, being a member of several metropolitan photographic societies, and having, he was sorry to say, very little to do with the prosperity of the Association; in fact, not so much as he wished to have. But, although he did not attend very often, he was pleased to see by the reports in the journals the good the Association was doing. He thought they might congratulate them-

selves on being one of the most useful photographic societies, and, although it was a secondary matter, upon their financial success.

Mr. W. P. DANDO seconded.

The CHAIRMAN observed that the Society was one that all the world looked to for information as to advances in photography.

Thanks to the retiring officers and committee were voted, Mr. R. P. Drage, the hon. secretary, being specially singled out for a warm compliment in recognition of his services as Hon. Secretary and Treasurer during the past year.

The election of officers for the ensuing twelve months resulted as follows:—*Trustees:* Messrs. J. Traill Taylor and J. B. B. Wellington.—*Committee:* Messrs. G. W. Atkins, H. D. Atkinson, Thomas Bedding, J. Weir Brown, C. H. Cooke, P. Everett, T. E. Freshwater, J. S. Teape.—*Curator:* A. Haddon.—*Librarian:* F. W. Pask.—*Hon. Secretary and Treasurer:* R. P. Drage, 95, Blenheim-crescent, W.

A large gift of photographic literature from Mrs. Corelli Bere, per Mr. H. E. Davis, was acknowledged, and the donor thanked.

Votes of condolence with Mr. A. Cowan, in the death of his daughter, and with Mr. George Shadbolt, in the terrible balloon accident to his son, Mr. C. V. Shadbolt, were passed.

THE NEW EASTMAN GELATINO-CHLORIDE PAPER.

Mr. H. M. SMITH exhibited prints produced on the new Eastman gelatino-chloride paper. He said that the ordinary sulphocyanide toning bath was not recommended for this paper, it having been found, by a series of experiments, that it was not the best, inasmuch as it had a bad effect on the gelatine, and made it very soft, so that it required exceeding care in handling.

Mr. W. E. DEBENHAM considered sulphocyanide toning the best in use, as it deposited so much gold that he believed the prints were more permanent than those toned in alkaline toning baths.

Mr. BROMLEY SMITH showed prints on the new Eastman paper toned with sulphocyanide. The prints had been alumned. Why did the Ilford Company condemn the combined bath and the Eastman Company recommend it?

Mr. Rapson also showed prints toned in ordinary lime and acetate baths.

Mr. G. W. ATKINS asked if Mr. H. M. Smith had found any difficulty in stripping the prints from glass which had been treated with French chalk.

Mr. H. M. SMITH had found talc fail, but not wax. If the latter were used, stripping was far more easy and certain.

Mr. DEBENHAM found that success with talc depended upon its having been well rubbed into the glass.

Mr. J. S. TEAPE said that in connexion with the waxing of glass the prints should always be well alumned. He had never failed with talc if it had been well rubbed in.

Mr. W. P. DANDO, in reference to the Eastman Company's instructions to mix the combined bath and decant off the clear liquid, said that he had mixed the bath, and after it had stood four or five days there were only about two ounces of clear liquid. Was the precipitate waste?

Mr. A. HADDON pointed out that the addition of carbonate of soda and alum to a solution of hypo threw down alumina, and asked why sulphate of soda could not be added directly?

Mr. H. M. SMITH said that the Eastman Company had been experimenting with that object, and, after a few remarks from Mr. BOLAS as to the effect of sulphate of soda on gelatine, it having been employed in carbon printing, gave the following formulæ:—

COMBINED TONING AND FIXING BATH FOR EASTMAN CHLORIDE PAPER.

No. 1.

Hypo	20 ounces.
Alum	5 ,,
Soda sulphate	10 ,,
Potash sulphate	2 ,,
Water	160 ,,

No. 2.

Gold chloride	15 grains.
Lead acetate	64 ,,
Water	8 ounces.

For use, eight ounces of No. 1 solution; one ounce of No. 2.

He observed that a red precipitate was thrown down in the gold solution, but, if shaken before addition to the hypo, it would be redissolved.

Formula for Blue Tones.

No. 1.

Borax	600 grains.
Water	160 ounces.

No. 2.

Gold chloride	15 grains.
Water	15 ounces.

For use, eight ounces of No. 1; half ounce of No. 2. The solutions must be kept separate.

The meeting adjourned after passing a vote of thanks to the chairman.

Harlesden and Willesden Photographic Society.—July 5, Mr. J. Naylor in the chair.—Mr. NAYLOR gave a demonstration of the *New Cold-bath Platinotype Process.* After a short *résumé* of the history and chemical theory of the process, he proceeded to show the superiority of the new process over the older ones. The printing, he explained, required to be carried on until the image was more visible than with the old process. The members then adjourned to his palatial dark room, when a practical demonstration of the development took place. The members were much interested in the manner of development, and the methods shown of saving an over-exposed print, or, by the addition of glycerine to the developer, over-developing certain portions stronger in order to gain greater contrasts when required. Referring to the methods of obtaining sepia tones with the aid of uranium and other metals, Mr. Naylor reported a discovery of his own, which he practically demonstrated for obtaining sepia and other warm tones by the addition of a small quantity of bromide of potassium to the developer.

Leytonstone Camera Club.—June 27, Annual General Meeting. The President (Dr. W. Pickett Turner) in the chair.—The statement and balance-sheet of the hon. secretaries accounted for sixty-eight members, and showed a balance of cash in the hands of the Hon. Treasurer. The election of officers was then proceeded with for the ensuing year ending 30th June, 1893, the directorate being constituted as follows:—*President:* Dr. W. Pickett Turner.—*Curator:* Mr. Herbert Summers.—*Caterer:* Mr. Simpson Turner.—*Treasurer:* Mr. Tom Symons.—*Hon. Secretaries:* Mr. Robert Overton, and Mr. Albert E. Bailey, Rose Bank, South West Road, Leytonstone (*vice* Mr. T. F. Sanderson, who did not stand for re-election).—*Council* (in addition to these gentlemen by virtue of their office) to consist of Messrs. F. W. Wates, A. P. Wire, T. F. Sanderson, A. T. Cuffley, D. G. Riddick, A. Newton, and Mr. Reinhold Thiele. Special reference was made by the Chairman to the invaluable services of Mr. T. F. Sanderson as joint Hon. Secretary. Their only consolation in his loss was that in his successor, Mr. A. E. Bailey, they had an excellent officer, a gentleman who would bring to bear upon his duties all the tact, experience, and practical knowledge which every member of the club knew him to possess. Active preparations are being made to make the first annual public exhibition of the club in October next "a big thing," an ambition which appears likely to be realised.

Birmingham Photographic Society.—June 23, Mr. George Smith in the chair.—Mr. H. V. Cox, Messrs. George Houghton & Son's representative, exhibited the "Shuttle" hand camera. A new and very cheap hand camera, manufactured by Messrs. Lewis & Company, Limited, was shown by Mr. W. S. Horton. The Eastman Photographic Materials Company, Limited, sent a number of sample packets of their new gelatino-chloride printing-out paper, which were distributed amongst the members present. Mr. EDWIN UNDERWOOD gave a short but exceedingly interesting paper on *Actinometers and their Use.* Mr. Underwood, in the course of his remarks, said that exposure tables were utterly inadequate as a guide to possible states of the weather, as it was a matter of individual notion as to what constituted dull, very dull, &c. The preparation of the bromide paper for use in the actinometer was explained. As to the necessity of an actinometer as an aid to the photographer, Mr. Underwood read a number of "tests" from his exposure book, a couple of which will suffice as examples. On November 2, 1891, at half past twelve, it took five seconds to secure the desired tint, while at a quarter past one it took four seconds. Again, on April 8, 1892, at twelve o'clock, it took twelve seconds to secure the tint, and at one o'clock it took twenty seconds. Mr. Underwood also explained the method of establishing a ratio between the plate and actinometer, and the method of calculating the exposure, &c.

South Manchester Photographic Society.—June 27, Mr. W. I. Chadwick in the chair.—Exhibits of holiday work were brought by Messrs. Bowden, Limull, Wood, and others. Questions were asked and replied to as regards toning, &c., of the exhibits. Mr. M. W. THOMPSTONE (Hon. Secretary) read a short paper on the *Platinum Process of Printing*, and gave a practical demonstration of the new platinotype papers, in the course of which he showed that prints could be developed by going over them with a brush charged with the potassium oxalate solution, or by floating or immersing them in the usual way. Over a dozen pictures were thus produced, which were to be preserved in the Society's technical folio. Mr. Thompstone said: "The first who really appears to have endeavoured to obtain a paper printing process by the means of platinum salts seems to be Robert Hunt, but as he was unable to obtain a workable one it was allowed to drop till the year 1874, when Willis succeeded in producing the first platinum printing process that could be relied on; and which, with very slight alteration, is the hot-bath process of the present day. Willis's process is, undoubtedly, a toning one, in so much that platinum replaces iron in the same manner as gold replaces silver in the albumenised and gelatino-chloride papers. That ferric were altered to ferrous salts by the action of light was known early on in photography, for Sir John Herschell prepared paper by means of the iron salts, and replaced them after printing with gold. Willis further improved it by substituting platinum for gold, and in discovering that a solution of potassium oxalate caused a precipitate, also the advantage of platinous over the platinic salts. The paper is first coated with a mixture composed of ferric oxalate and platinous chloride, but after it has been exposed to light we have present both ferric and ferrous salts in union with the platinum one, but not in a chemical state. The ferrous salt has only the power of reducing the platinum in the presence of potassium oxalate, but the ferric possesses no such power when so treated, so the following reaction takes place: When the print is immersed in the potassium oxalate the ferrous oxalate formed dissolves, and, in so doing, throws down the platinum in a metallic state in proportion as it has been acted on by light when exposed under the negative; but where the light has not been able to penetrate the ferric salts remains unaltered, and no reduction of the platinum takes place. The next thing is to remove the ferric salt, which is done by immersing it in several changes of hydrochloric acid diluted in the proportion of one part of acid to sixty parts of water. In the cold-bath process the platinum is added to the developer instead of being contained in the paper as in the hot bath. Recently, the Platinotype Company have introduced a new paper similar to the hot bath, but the developer is used cold. This is the process I intend showing you to-night. The paper having been exposed in the ordinary way till the details can be distinguished, it is placed in the developer, viz., one pound of potassium oxalate to sixty ounces of water. The image soon makes its appearance, and darkens rapidly, but is quite under control. As soon as it has arrived at the required density it is placed in the first clearing bath, and left for about five minutes, then in a second and third till there is no trace of yellowness in the last bath, washed for about half an hour, dried, and mounted in the ordinary way. I find that I get better results with a thin but vigorous negative than I do with denser ones, and as for the results I don't think those obtained by means of silver can compare with the platinum for their velvety softness and beauty of tone." After the demonstration several questions were replied to, and various experiences given. Mr. W. I. CHADWICK read a

paper on the *Magic Lantern* (see page 437), and exhibited a sciopticon in operation, with a transparent screen made to roll up into a very small space, and supported by a pair of portable legs. The whole of the lantern and screen could be placed on a dining-room table, exhibiting a three-feet-six-inch picture, which was considered large enough for most private-house exhibitions.

Southport Social Photographic Club.—June 29.—Mr. C. F. Depree gave a demonstration on the *Intensification and Reduction of Negatives.* The process employed for intensification was that known as Monckhoven's cyanide method, by which a mixture of silver and mercury is deposited on the image, and for reduction the demonstrator made use of the ferridcyanide solution introduced by Mr. Howard Farmer. The results in both cases were highly successful, and at the close a hearty vote of thanks was accorded to Mr. Depree.

Photographic Society of Philadelphia.—June 8, Mr. Joseph H. Burroughs (President) in the chair.—A communication from Mr. F. C. Beach, Editor of the *American Amateur Photographer*, was read, in regard to a petition for the extension of the photographic privilege at the World's Fair in Chicago in 1893. On motion of Mr. Taylor, the President was authorised to sign the petition representing the 200 active and life members of the Society. Mr. G. B. Wood exhibited a small camera which a friend of his had brought from Paris. It was of the size and shape of an opera or field glass, and carried twelve plates, size 2¾ × 1¾. The lens was of a universal focus, and was contained in one side of the camera. The other side was used as a finder, the exposure being made by an exposing shutter on the lens. He also exhibited a very ingenious dark lantern for use when travelling. It contained a reservoir for stearine, so arranged that when the lamp was lighted the heat melted the stearine, which then down to the wick. The lantern was small and compact, and could be readily packed for travelling. Mr. Jennings exhibited a series of lantern and stereoscopic slides of lightning flashes. The stereoscopic pictures, he claimed, were the first ever made of the heavens' electrical discharges, and the stereoscopic effect was decidedly interesting. In one case the sensitive plate had caught the mystical thunderbolt, from which radiated, in various directions, numerous tongues of flame. The theory of the exhibitor was that thunderbolts were formed by a collision of flashes and a consequent scattering of the discharge into a number of points or balls of flame, which travelled onward into space on their own account. In another view the stereoscope revealed the fact that a discharge apparently zig-zag in its direction was really spiral in its course. Mr. Browne submitted two negatives for inspection, one of which, a flashlight picture, was disfigured by a wavy ribbon of light across the centre. The other was dotted with small circular spots of white glass. The latter he believed to be due to the use of a rose nozzle in washing, a wearing away by the continued action of water; but the former he was utterly at a loss to account for. Mr. Wood stated that he noticed the other day, on examining certain negatives taken seven or eight years ago, that the film was leaving the plate—coming off in great flakes. The plates were not frilled when developed, and he thought, perhaps, the alum bath rendered the film brittle, and gave it a tendency to leave the plate. Mr. G. M. Taylor said he knew of an instance where the film had left the celluloid altogether—had peeled off in one piece. Mr. Young exhibited negatives made by the new Zeiss Anastigmat lens manufactured by the Bausch & Lomb Company. The lens was 4 × 5, but Mr. Young tried it on a 6½ × 8½ plate, with full opening, and it covered the plate well to the margin. The definition, depth of focus, and rapidity were remarkable. Mr. Pancoast showed a panoramic photograph of the city of Waterbury, Conn., which he had taken by means of an adjustable tripod top of his own manufacture. Four 8 × 10 plates were used, and the pivotal top he had carefully subdivided into four positions, embracing in all 101 degrees. He had a supplementary arrangement with five positions, which would take in 124 degrees. The picture exhibited showed great uniformity, and the continuity was admirable.

Correspondence.

"TALBOT ARCHER" AND THE CONVENTION.

To the Editor.

Sir,—"Cosmos" and my kind friend "Brum" must indeed think me a green hand if they fancy I am to be "drawn" by their anonymous and personal remarks. We have all heard of "Satan reproving sin," and their communications are indeed a case in point. Some time back, similar letters attacking me appeared in a photographic periodical, and when the editor wrote to the address given it was found to be a void house in this city. But, under any circumstances, I should not think of committing the gross breach of press etiquette into which they would speciously try to lead me. I shall take no notice whatever of any further communications upon the subject.—I am, yours, &c.,

Birmingham, July 4, 1892. W. J. Harrison.

[In bringing this controversy to a close, we cannot refrain from observing that, as we understand press etiquette, Mr. Harrison is in no sense precluded from denying such charges as those which "Cosmos" prefers against him.—Ed.]

ORTHOCHROMATIC PHOTOGRAPHY.

To the Editor.

Sir,—Our attention has been called to a letter in your issue of 24th ultimo from Messrs. B. J. Edwards & Co. on above subject, and having acted as agents for Dr. Vogel in connexion with his British patent and the opposition of Messrs. Edwards thereto, in the interest of our client we cannot allow the statements in said letter to remain uncontradicted.

We shall therefore be obliged if you will permit us to state that so far from its being correct that such patent was "successfully opposed" by Messrs. Edwards, the fact that such patent was granted is clear proof that the opposition to such grant failed, the Comptroller in his decision stating that in his opinion 'the process of Dr. Vogel differs materially from that of Abel'—that is, the patent on which Messrs. Edwards relied to prevent the grant of Dr. Vogel's patent. It is true that a reference clause was inserted in the specification, but in stating this Messrs. Edwards omit to point out that before the opposition was heard Dr. Vogel offered to insert in his specification a clause with a specific reference to the Abel patent, but that Messrs. Edwards refused to agree to this (although the original suggestion that such a clause should be inserted came from the patent agent acting for them in the matter); while in his decision the Comptroller does not consider it necessary that the reference clause should make such specific reference to said patent, and in other ways makes the reference clause much less comprehensive than the one Dr. Vogel was prepared to agree to without any compulsion. We therefore entirely fail to understand how Messrs. Edwards can consistently maintain that their opposition was in any sense successful.

With regard to the claims, it is absolutely incorrect that "by order of the Comptroller, Dr. Vogel's principal claims were struck out." The reduction of the number of claims was *not* by order of the Comptroller, but on the suggestion of Dr. Vogel's own counsel, as he thought that those retained fully covered the invention, the others (so far from being the *principal* ones) being superfluous); and as we agreed with this view we recommended Dr. Vogel to adopt this suggestion, which he did. The Comptroller in his decision leaves the matter of the omission or retention of any of the claims entirely to Dr. Vogel's discretion, his words being, "Any or either of the claims numbered 2, 3, 4, and 5, may be struck out, *as proposed by the applicants' counsel at the hearing.*"

With the exception of the insertion of the reference clause stated, and the omission of such claims as were considered superfluous (and which it was left to Dr. Vogel to omit or not as he chose), the specification originally filed was in no way altered.

We totally deny that the legal effect of the reference clause inserted is "that the process, if used at all in this country, could only be so used by licence under the Tailfer (Abel) patent," as it in no way refers to such patent; and even if it did, it would not prevent Dr. Vogel from contesting the validity thereof, or maintaining that his patent does not infringe same in any way.—We are, yours, &c., Allison Bros.

52 *Chancery-lane, London, W.C., July* 1, 1892.

To the Editor.

Sir,—In your valuable Journal (June 24, p. 414), Mr. Edwards asserts that "the system of 'optically sensitising' by means of dyes is well known as Dr. Vogel's, and should not be confused with the Tailfer process of chemical sensitising," which, if there is any meaning in it, shows that Mr. Edwards does not know what an optical sensitiser is.

I call an optical sensitiser such a one which sensitises bromide or chloride of silver only for those spectrum rays which it absorbs. That action is one proper to both eosine and erythrosine; hence, in my meaning of the word, *both* are *optical sensitisers.*

A chemical sensitiser, on the other hand, would be one that combines with iodine or bromine liberated by exposing iodide or bromide of silver to light. Eosine and erythrosine do not do that; they are therefore not chemical sensitisers in my application of the word.

Now, I can assure Mr. Edwards that I am as anxious as he is that my system of combining, in a definite form, the dye with the soluble silver bath should not be confused with his (Tailfer's) plan of "*chemical sensitising,*" *as he calls it,* in which "*only so much remains in the film as is combined with the silver bromide.*

It may be remarked that an attempt was made to patent the Tailfer process also in Germany, but, as it is the duty of the German Imperial Patent Office to examine patent applications and claims beforehand as to their novelty, the said patent was refused by the German Imperial Patent Office.

Mr. Edwards opposed my English patent for the application of "Eoside of Silver," not, as he says, successfully, but *unsuccessfully*, for the patent was granted with *slight* modification of the claim, and the *principal* claim —that of the silver eoside—*was granted, not struck out*, as Mr. Edwards asserts.

He proceeds to say "that the process was no improvement, and of no commercial value" on account of the want of keeping qualities of the plates. This statement is on a par with his other assertions. Apart from England the plates are sold largely in Germany, Italy, and America, and the sale is continually increasing. That the early plates, made four or five years ago, may sometimes have been deficient in keeping quality has nothing to do with the *principle* on which they are made sensitive to the yellow-red rays of the spectrum, but with the want of sufficient experience on the part of the plate-makers. Their keeping quality is now everything that could be desired, though the process by which they are made differs in every essential point from that of the Tailfer patent. The manner in which Mr. Edwards derides the value of my process needs no comment, as it only shows his own ignorance of these matters.—I am, yours, &c., Dr. H. W. Vogel.

Berlin, June 30, 1892.

To the EDITOR.

SIR,—It is far from my wish or intention to enter on a controversy on the above subject, but I cannot allow Mr. Edwards' letter, charging me with inaccuracies, and which I cannot for a moment admit, to pass unanswered. I may at once state that I am quite willing to stand by every word in my paper, which has been written neither hastily nor without sufficient data at my command.

Regarding my mentioning Mr. Clayton's name, I had no intention of making out a complete list of those who have helped to make orthochromatic photography what it is to-day, or I should not have left out such names as Captain Abney, Mr. Bothamley, and many others. However, Mr. Edwards' remarks amount to the veriest quibble. To the outside world Mr. Clayton is just as much the so-called real inventor as Mr. Tailfer; and, moreover, in other ways, Mr. Clayton is at least as conspicuous as Mr. Tailfer. But this is absolutely unimportant, and outside the question.

We are not all obliged to agree with Colonel Waterhouse that to Mr. Tailfer "alone is due the credit of the successful application of the colour-sensitising properties of eosine to the gelatino-bromide process," and, even if we did, it would have no effect on the question of patent value.

With reference to my "incomplete description of the Tailfer process," I have given it as full as possible. There is no description of *modus operandi*, as any one can see for himself who will take the trouble to read Patent No. 101, 1883, and certainly no one could make plates commercially (this has been tried) with only the specification information.

That the Tailfer plates were not dyed, is an incorrect statement of Mr. Edwards'. I have had many boxes of Tailfer plates, and they were very red in colour. With regard to the plates manufactured by Messrs. Edwards & Co., it is quite another question—a very small amount of dye *is* present, but that dye is present combined with silver, as recommended in Professor Vogel's patent. I have already given my views *re* "optical" and "chemical" sensitising in my paper, so will not take up your space with that subject. They are, however, diametrically opposed to those of Mr. Edwards', but I may mention that they are quite in accord with those of Captain Abney and others. Professor Vogel's patent was *not* successfully opposed by Mr. Edwards—the patent was allowed, after adding a disclaimer, which in no way affected the validity of the patent, and, if sufficient technical and scientific knowledge had been at hand even this disclaimer would probably have been superfluous. The true reason why Dr. Vogel allowed his patent to lapse, was, I suppose, because no one had either sufficient enterprise or ability to work it in this country. And it is not true that the process has no commercial value, for plates are made in large quantities in Germany and elsewhere by this method (Dr. Vogel's), and all, or nearly all, orthochromatised plates I have come across contain silver associated with the dye. Plenty of plates manufactured by Vogel's process have, I understand, been sold in England since the granting of the patent. In connexion with the whole matter, Professor Eder is the greatest authority on the subject, and his expressed opinion is entirely in favour of the Vogel method.

With reference to Messrs. Lumière working under a licence from Tailfer, I have had some further correspondence from M. Vidal, which will tend to show by what kind of means the poor patent has to be propped up. My statement in my paper was also from M. Vidal's letter; I give his own words: "Le brevet de MM. Clayton & Tailfer n'est exploité que par le titulaire Attout-Tailfer, et encore très peu, ses produits étant de valeur inférieure. Les plaques que l'on préfère sont celles que fabrique la maison Lumière de Lyon; elles sont préparées par un procédé tout différent." In a more recent letter M. Vidal says: "Quant au Lumière, voici ce qui s'est passé. Cette maison produisait des plaques orthochromatiques. M. Tailfer les a menacé d'un procès. Voyant les menaces sans effet M. Tailfer a fait offrir à MM. Lumière de leur accorder *gratuitement* une licence. Ces messieurs voyant qu'ils éviteraient aussi les ennuis du procès dont on les menaçait—bien qu'à tort—ont consenti à *acheter* gratuitement la licence en question, à la seule condition de mettre sur les boîtes les mots '*avec l'autorisation de M. Tailfer*,' ce qu'ils n'ont fait que quelques fois. M. Tailfer a voulu user de sa victoire en entraînant la maison Monckhoven à lui acheter une licence; et il lui a écrit qu'il lui donnerait pour rien, tandis que MM. Lumière lui avaient payé 30,000 francs. J'ai montré à la maison Monckhoven la lettre de Lumière me déclarant ce qui s'était passé: 'Rien payé, pas un centime,' dit cette lettre." And much more information, not particularly edifying to those concerned, which I would prefer to withhold.

Apologising for taking up so much of your space,—I am, yours, &c.,

July 4, 1892. J. J. ACWORTH, Ph.D., F.I.C., F.C.S.

HELIOCHROMY.

To the EDITOR.

SIR,—In reply to Mr. Ives' remarks, page 430, I will begin by quoting his own words: "I regret that I am obliged to occupy your valuable space with replies to statements which ought never to have been made." But so long as Mr. Ives continues to publish wrong assertions against me, I am obliged to answer him. He asserts that an "identical statement" (like that he communicated to the Franklin Institute over his claims) "was submitted to Dr. Vogel for criticism." I answer, *I have never received such a statement.*

Mr. Ives says further, "Dr. Vogel also certainly knows that Du Hauron never gave my (Ives') chlorophyll process up in favour of Dr. Vogel's eosine process." In reply to that, I may mention that I have never asserted that Ducos du Hauron had used *Ives'* process or *my* eosine process, both published several years *after* Du Hauron's paper.

Mr. Ives says further, that my "idea cannot be carried out in accordance with the facts which support the Young-Helmholtz theory," &c. I answer, My idea is *already carried out* and worked out in practice in Berlin. Specimens of my process were again exhibited here three weeks ago, and have received the praise of the most eminent painters and scientists of Germany, and of the first art critics of the German newspapers. Even Dr. Von Helmholtz himself has visited this exhibition, and declared that the results *are in accordance with his theories! Verb. sap.* Perhaps Mr. Ives only knows those parts of Helmholtz's researches which are related to Young's, but not Helmholtz's many other independent papers on over-colour vision.

Mr. Ives says further, "Dr. Vogel was in error when he says he acknowledged the 'heliochromoscope' on page 318." I maintain my assertion as true. Every reader of your valuable JOURNAL may convince himself of the correctness of my words. More than that, I have also acknowledged the heliochromoscope in the *Standard*, in an article Mr. Ives has certainly read. I allow Mr. Ives the honour of employing the old Ducos du Hauron principle first for making coloured lantern slides by projection.

But I am sorry to say that I must now qualify my acknowledgment, since Mr. L. Vidal, of Paris, has published in *Anthony's Bulletin*, p. 297, the following lines:—"We consider it as a duty to remind him (Ives) that a description of the principle of the apparatus of this kind (heliochromoscope) appears in a paper published in 1869 by C. Cros."—I am, yours, &c.,

DR. H. W. VOGEL.

Berlin, July 4, 1892.

SPEED OF PLATES.

To the EDITOR.

SIR,—The mode of ascertaining the speed of plates proposed by Mr. Watkins in his letter of May 20, and further explained in your last issue, would be very simple indeed if it could be shown to be reliable; but, unfortunately, it will be found that development, for a certain time, will not ensure the results desired. As pointed out by Mr. Phillips, much more extended observations must be made even to obtain an approximately accurate result.

Granting that, if carefully made, a Spurge's sensitometer might give as great an accuracy of comparative illumination as the simple plan adopted by Messrs. Hurter & Driffield, I am unable to see that it would be more convenient. A number of plates could not be exposed at the same time, by which means the effect of any slight variation in the source of light may be eliminated, and a fair comparison made.

Mr. Watkins objects to the standard candle, but does not suggest anything superior, and, should he succeed in finding a better standard than the candle now used by Messrs. Hurter & Driffield, the accuracy of which is very great when their conditions respecting height of flame are strictly adhered to, it will be equally available for either method of exposing the plate.

The densities obtained still have to be dealt with, and I select the following to show that no indication of the speed of plates can be obtained by the simple comparison of the densities as proposed by Mr. Watkins. Four plates of unknown speeds were exposed at one time (1¼ to 160 candle-metre seconds), and developed together for the same length of time. The densities, when measured, were as under:—

	1.	2.	3.	4.
1¼ C. M. S.	·09	·14	·30	·16
2½ ,, ...	·33	·47	·50	·43
5 ,, ...	·68	·86	·74	·77
10 ,, ...	1·06	1·26	1·01	1·13
20 ,, ...	1·45	1·64	1·21	1·47
40 ,, ...	1·76	1·92	1·33	1·78
80 ,, ...	2·01	2·17	1·44	1·97
160 ,, ...	2·21	2·31	1·55	2·14
Inertia	1·45	1·1	·65	1·1
Actinograph speed.....	23	31	52	31
Development factor	1·25	1·3	·85	1·15

Densities of 1·45, 1·44, and 1·47, which, to the eye, appear equal, are found upon plates 1, 3, and 4, and, being due to the same exposure upon 1 and 4, the plates would, by Mr. Watkins' method, be considered of equal speed, instead of as 23 to 31.

The same density upon No. 3 was only obtained with four times the

light, and would be taken to be four times as slow as the others, whereas it is twice as rapid as No. 1.

Nos. 2 and 4 are equal in rapidity, but do not correspond in density anywhere.

It will be seen that the different development factor reached in each case prevents the estimation of speed by inspection, and is most misleading with the fastest plate. When, however, the curve is laid down upon Messrs. Hurter & Driffield's plan, the speed of the plates is at once determined with great accuracy.—I am, yours, &c., JOHN STERRY.

Redhill, July 4, 1892.

THE DARK FLASH.

To the EDITOR.

SIR,—I can corroborate Mr. Dunmore's statement in last week's BRITISH JOURNAL OF PHOTOGRAPHY *re* the above, as I saw it quite distinctly; there were, however, two flashes, one light, the other dark, and, although I saw both flashes practically at the same time, the light one seemed to be formed first, probably because it travelled quicker than the dark one. The effect took place about 10 p.m. in the north-east part of the sky, the light flash being on the northern, and the dark flash on the eastern side, the colour of this being difficult to describe other than a mixture of very dark red or purple brown, with dark grey, the background of clouds being illuminated by the light flash.—I am, yours, &c.,

Tonbridge, July 4, 1892. J. BARKER.

TONING SILVER PRINTS DURING THUNDERSTORMS.

To the EDITOR.

SIR,—Last night (Tuesday, June 28) we had one of the most terrific thunderstorms ever known in this neighbourhood.

Can you or your readers tell me if they have ever found great difficulty in toning silver prints during the time of, or immediately preceding, a severe storm? I found my prints would not tone up to the usual standard of colour on Tuesday night, and yet I used the same bath that I have used for years, and which I found answered well on Wednesday morning after the storm had passed over.

What I want to know is, Am I justified in attributing the fact that my prints refused to tone to the intensely electrical state that the atmosphere is supposed and believed to be in at such a time?

I enclose two prints with notes at the back, and you can publish this or not as you think well. If you think it of interest, I would write a short article for the ALMANAC next year.—I am, yours, &c.,

High-street, Weybridge, June 29, 1892. THOMAS GRIFFIN.

CORRECT EXPOSURE.

To the EDITOR.

SIR,—As Mr. Michael adopts my wording that "the stop has been reduced to a quarter of the area, and allows exactly the *same* amount of light to pass as before," surely it is evident that when the plate is placed at half the original distance (which fact I had by no means forgotten), where the *same* amount of light covers the *same* area of plate, the illumination must be equal.—I am, yours, &c., JOHN STERRY.

Red Hill, July 4, 1892.

To the EDITOR.

SIR,—The law relating to the intensity of illumination upon which Mr. Michael bases his argument does not apply to the case at all; it is true only of *diverging* rays, and depends entirely upon the fact that the further an object is from the source of light the fewer will be the rays that fall upon it, and not because any individual ray loses in intensity.

Now, in the case of two lenses, one double the focal length of the other, and both having the same relative stop, the number of rays of light from any unit of surface of the landscape which pass through the stops will, in the case of the longer-focus lens, be four times greater than in the case of the shorter-focus one, for the area of the stop is as four to one.

The shorter-focus lens, however, forms an image on the plate with these rays, which is only a quarter the area of the image formed by the longer-focus one; therefore in each case the number of rays of light which fall upon a given unit of surface of the plate will be equal.—I am, yours, &c., E. COLLIER GREEN.

Derby, July 6th, 1892.

THE PRICE OF SILVER.

To the EDITOR.

SIR,—On all sides it is said that silver was never known to be cheap as it is now. Why is it, sir, that photographers cannot benefit by this low state of the market? There is nothing to grumble at as to the price paid for plates, but surely there is no genuine reason why sensitised paper should remain at the price it was when silver was nearly double its present rate. If you kindly insert this in the JOURNAL, it may be that some of the makers of sensitised paper will come to the fore and enlighten the subject a little.—I am, yours, &c., A. HORTON.

Cardiff, June 29, 1892.

PRESERVATION OF SILVERED MIRRORS.

To the EDITOR.

SIR,—Mr. Ives is exactly thirty-six years too late with his suggestion. When Liebig first published the process in 1856, he suggested that the surface should be varnished. I quote from his paper as given in the *Journal de Pharmacie et de Chimie*, troisième série, tome trentième, page 74, as follows:—"Lorsque le miroir est sec, on recouvre le tain d'un vernis incolore composé d'une dissolution alcoolique de résine de Dammar; ensuite on encadre." For astronomical purposes, no one nowadays would ever dream of spoiling the surface of mirror or flat with varnish. The silver film adheres to the glass so tenaciously when properly done, that it will bear a very great amount of rubbing without coming off. Dr. Draper has stated that the thickness of the silver film is only the $\frac{1}{250000}$ of an inch. Varnish of any kind, whether celluloid or collodion, never could be put on of such extreme tenuity as to approach this, and of uniform thickness.

I have had considerable experience recently in silvering mirrors ground by myself, and I should never dream either of varnishing them or of polishing the silver film with *cotton wool* and rouge.

July 5, 1892. PROCELLA.

["Procella" is not quite correct in several points. First, Mr. Ives' suggestion of using a celluloid protection for a mirror cannot well be "exactly thirty-six years" too late, for celluloid has not yet been this time before the world, and the quotation given from Liebig speaks of dammar, not celluloid varnish. Secondly, Is "Procella" sure that Liebig was the first to publish the process in 1856? Is he unaware that the invention was really made and patented by Thos. Drayton, a London chemist, in December, 1848? Lastly, the application of the varnish was suggested, not to ensure the adhesion of the silver to the glass, but to prevent its becoming tarnished.—ED.]

INCREASE OF PLATE SENSITIVENESS BY KEEPING—TONING AND FIXING BATHS.

To the EDITOR.

SIR,—Two items in the JOURNAL of this week have arrested my attention. First, with regard to the increase of sensitiveness of dry plates by keeping, I wish to bring to your notice what has happened in my own case. In the early summer of 1890 I prepared a batch of plates by boiling with ammonia, and on trying I found them extremely slow and thin, but clean and with good detail. I put them up in the dark room, closely papered, and in empty negative boxes. They have lain there since, till last week. At that time I was in Belturbet, but my son was carrying on the business. I was quite surprised to hear from him that, being short of an Ilford half-plate, he used one of this old batch. Result, a good printing negative and exposure same as he was giving Ilford Ordinary. This is item one.

The Eastman combined toning and fixing bath.—In reading over your "Editorial Table," I was struck with the similarity of the first part of their fixing and toning bath to one for fixing, which I submitted to the Ilford people some months back, and for which I claimed that it would render the gelatine surface so hard that after enamelling water could be taken off the face of the paper without leaving a mark on the glossy surface. I believe I am amongst the oldest of emulsion paper workers, commencing with Obernetter's collodio-chloride of silver paper in 1873, and following the same maker in gelatine to the advent of the Ilford people.

Formula for fixing bath,—

Hypo. of soda	16 ounces.
Alum	16 ,,
Bicarbonate of soda	4 ,,
Water	4 quarts.

Hypo dissolved first, bicarbonate added and dissolved, and alum last. A copious white precipitate falls, which settles in twenty-four hours, when the clear part is decanted for use. Time of fixation, not less than ten nor more than fifteen minutes.—I am, yours, &c., J. PATTERSON.

Caron, Ireland, June 25, 1892.

Exchange Column.

**** No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Will exchange a sweet-toned American organ, very little used, for a 15×12 or 12×10 camera, with three double slides; must be light, for outdoor photography.—Address J. E. COLE, the Studio, Holy Croft, Keighley.

Will exchange ferrotype camera, fitted with two lenses, to take four pictures on half-plate, for a few really good backgrounds, interior and exterior.—Address, J. WILLIS, Rembrandt Studio, Southend-on-Sea.

Will exchange Lancaster's gem camera, nine lenses, takes thirty-six on plate 7×5, with 1890 Gem and Victoria mounts, for half-plate or 7×5 rapid rectilinear or rapid symmetrical lens, any good maker.—Address, T. MILNTHORP, Market-place, Romsey, Hants.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

G. B. Bradshaw & Co., Altrincham.—*"We'll be late for the poll."*

John William Beanfort, Birmingham.—*Photograph of Austin Chamberlain.*

Thomas Ashby Flemons, Tonbridge.—*Photograph of the Luncheon Party at Tunbridge Vicarage, June 28, 1892.*

J. C.—Received.

R. C. PHILLIPS.—Thanks; next week.

PERPLEXED.—The print is imperfectly fixed.

C. H. M. (West Hampstead).—Received; thanks.

CHEMICUS.—By ammonic hydrate the ordinary liquor ammoniæ ·880 is generally understood.

D. AVANZO.—Hardwich's *Photographic Chemistry* (J. & A. Churchill, Burlington-street, London, W.). Price 7s. 6d.

G. SCOTT.—Under varying conditions the three kinds of plates named are, probably, equally as good for portraiture.

VALENTINE & SONS.—A cold varnish for negatives may be made by dissolving gum dammar in benzole to the consistency of cream.

SPOTS.—The mottlings on the prints are due to the action of the mountant on the mount, the enamel of which was not properly "fixed."

NONPLUSSED.—The prints were imperfectly fixed. The discolouration of the silver solution is due to the dye being abstracted from the paper.

CADMUS.—Given both forms of lens mentioned of good construction, their defining powers both for foreground and distance should be equal.

R. STURROCK.—Yes, you have been rightly informed. Glycerine applied to a print on the new platinotype paper before development acts as a restrainer.

J. WOOD.—A negative from a negative may be made by the addition of sulphourea to the developer, according to the method suggested by Colonel Waterhouse.

A. WYNCH.—I. The mountant given at page 790 of the current ALMANAC is, perhaps, as suitable as any. 2. The "permanence" of gelatino-chloride prints has not yet been called into question.

A. Z. Y.—The "peculiar marks" on the prints are due to finger or thumb marks on the paper before it is printed, or, may be, before toning.

SYDNEY A. HARDING.—There is a work on *Collotype and Photo-lithography* by Dr. Julius Schnauss, translated by Mr. E. C. Middleton. It is published by Messrs. Iliffe & Son, St. Bride-street, E.C.

SEVERAL correspondents who have forwarded us Messrs. Hamfeldt and Stahlberg's circular relating to the Helsingfors International Photographic Exchange are thanked for responding to our invitation.

PATENTEE.—Before you commit yourself to any threat against the dealer who you say is infringing your patent rights, you had better make a careful perusal of the important law case which is given in another part of the JOURNAL.

SAXON.—Considerable intensity, probably greater than that obtained by the ordinary processes of mercuric intensification, may be imparted to the negative by bleaching as usual, and "blackening" with an ordinary ferrous-oxalate developer.

E. HARVEY—Permission to photograph in the royal parks may be obtained by addressing H. W. Primrose, Esq., Office of Works, Whitehall, S.W.; and for the other parks of H. de la Hooke, Esq., London County Council, Spring Gardens, S.W.

A. STANWAY.—In the best studios on the Continent only plain backgrounds are used, or landscapes and interiors, which are artistically painted so that they are little more than suggestive. The pronounced scenic background of twenty years ago is never used now.

C. W. KINGSTOW (Glamorgan).—From the description, the paper seems to be of the right kind. But we cannot say for certain without seeing a sample. If it was supplied by a photographic chemist for the purpose required, it is no doubt the correct thing.

B. BROWNLOW.—The only way of keeping the sun out of the studio is to make the outside boards higher. Bear in mind that at this time the sun is at its highest altitude, and it is for this reason that the hoarding that effectually stopped it out a month ago, does not do so now.

S. A. (Leeds).—The best work for your purpose, although it does not deal specially with photographic chemicals, is Fresenius' *Chemical Analysis*. There are two volumes, one devoted to qualitative, and the other to quantitative analysis. The former will answer your purpose at first.

ALIC.—In our report of the last meeting of the London and Provincial Photographic Association you will find two new formulæ of the Eastman Company for their gelatino-chloride paper, the employment of either of which will obviate the precipitate of which you complain with the original formula.

F. HARRINGTON & Co. ask where a copy of the catalogue of the Munich Fine Arts Exhibition can be obtained. Any foreign bookseller would, we presume, obtain a copy to order. Or a Post Office Order for two marks, and the necessary amount for postage, addressed to the Secretary of the Exhibition, the Gaspalast, Munich, would secure a copy.

C. P. C. asks: "Who is the person to apply to for permission to photograph Tintern Abbey?"—Perhaps some reader can supply the information desired.

S. W. C.—In taking reversed negatives for photo-mechanical and other purposes for which they are required, a mirror, provided it be optically plane, will answer quite as well as the more expensive prism. But it must be borne in mind that a defective mirror, or prism, will quite destroy the quality of the most perfect lens. Therefore, whichever be used, it must be optically perfect.

F. STONEHAM.—Pizzighelli & Hubl's work on *Platinotype* (published by the Photographic Society of Great Britain, price 2s.) treats exhaustively of the earlier platinum processes. There is no book which brings the subject up to date, and your best plan, therefore, would be to consult the indices of our more recent volumes, and digest the various articles on platinotype contained therein. This, with the necessary practical experiments, should meet your purpose.

E. COOPER asks for a simple method of reducing silver prints that are over-printed.—Several methods have from time to time been suggested which, in a sense, answer; but the prints are seldom as good as those that are printed to the proper depth in the first instance. As a matter of fact those who print professionally do not consider it worth while to waste time in doctoring over-printed impressions, but simply tear them up and make fresh ones. Our advice is, follow their example and do the same. It will save time and ensure better results.

S. A. J. says: "I was apprenticed to my present employer for three years. My uncle paid a premium of one hundred and twenty-five pounds for the apprenticeship, I to receive nine, twelve, and fifteen shillings a week as salary. I have served two years of the time, and have done nothing but printing, and have never yet worked in the studio. In fact, I have been employed solely to do the work of a man whom he would have to pay three times the wages to. Can I compel my master to teach me the portrait work?"—This is a very common complaint of those who take apprentices with a premium. The uncle should consult a solicitor on the matter.

S. TREBBS writes: "I have got—or, rather, expect to get—an order to photograph a quantity of furniture to illustrate a manufacturer's catalogue. A great deal of it is inlaid wood. Some is inlaid with metal. As I have never done anything of the kind before, although I am an old photographer, can you give me any hints that will help me, I mean with regard to photographing this class of work?"—The best effects will be obtained by photographing the objects before they are polished, as then there are no reflections to contend with, and finer detail will be obtained. It is in the unpolished state—after being slightly oiled, which brings out the grains of the wood—that this class of goods is most satisfactorily photographed. If, however, the things are already polished, then they must be dealt with as they are, in which case use backed plates, and arrange the lighting so as to avoid reflection in the direction of the lens as much as possible.

COLLODION writes: "Kindly inform me of a reliable method of keeping wet plates wet for two or three hours after sensitising, so that they can be exposed after that length of time. Is there not a method of coating with a liquid of which Bass's beer is a constituent?"—There are several methods by which collodion plates may be kept moist, such as coating them with such things as honey, oxymel, glycerine, &c., but they are all more or less unsatisfactory, particularly with regard to sensibility and quality of negative, except in experienced hands. The beer, coffee, and other processes of that class are practically dry processes. It will be found far more convenient, when negatives of the wet-plate character are required, and the plate cannot be exposed as soon as prepared, to use some of those plates specially prepared for photo-mechanical work. These plates are slow, but they yield negatives that have all the characteristics of wet-plate ones.

WEST LONDON PHOTOGRAPHIC SOCIETY.—July 9, Oxted.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—July 14, Members' Open Night. 16, Outing, West Drayton.

PHOTOGRAPHIC CLUB.—July 13, *Photographing Natural History Specimens.* 20, *Photo-mechanical Processes.* Outing, Saturday next, July 9, Rickmansworth. Trains from Euston, quarter past two.

MR. ALEXANDER P. TAYLOR, late photographer, Dunfermline, died at his residence in New-row, Dunfermline, on Thursday, June 23. Mr. Taylor had suffered from indifferent health for about six months. Mr. Taylor was a native of Dunfermline. He began life as a grocer, but his knowledge of chemicals led him ultimately to give up the grocery trade and take to photography. Photography had scarcely been reduced to an art in Mr. Taylor's early days, and if the work he produced would not compare favourably with what can be had in Dunfermline to-day, it was wonderful for the times, and certainly creditable to a man who had, in the real sense of the words, been self-taught. Mr. Taylor was sixty-eight years of age.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1680. Vol. XXXIX.—JULY 15, 1892.

SOME POINTS IN MR. DAVISON'S ADDRESS TO THE CONVENTION.

The chivalrous compliment which he pays to Mr. H. P. Robinson in the opening sentences of his address, and the modest manner in which he exempts himself from following in the footsteps of his predecessors in the presidential chair in criticising scientific advances or inventions in photography during the preceding year, are in that admirable taste which we looked for in the President of the Convention. And, if Mr. Davison does not wholly confine himself to a consideration of the bearings which those new developments and discoveries have upon pictorial work in photography, he disarms the objections of those he may have disappointed by demonstrating to them by his intelligent references to recent optical improvements, to Messrs. Hurter & Driffield's labours, to the struggle for the survival of the fittest among printing surfaces, to photo-mechanical processes, and other subjects usually conceded to be the almost exclusive concern of those to whom photography is of least account as a picture-making art, that it is difficult, if not out of the question, for those who profess to pin their allegiance to photography, simply because it is capable of realising their aspirations after artistic effect, to avoid acquiring and holding a deep interest in the progress of photographic science, of which it is an undoubted obligation that they should cultivate a knowledge hardly less comprehensive than that of scientific men themselves.

Briefly it comes to this, that Mr. Davison, as the accredited spokesman of that large and growing section of photographers to whom photography appeals as an art and as an art alone, annihilates the fiction that that school can afford, or really attempts, to ignore or remain indifferent to its importance as a far-reaching progressive science. In fact, photographic science must be nearly as much at the finger ends of the artist in photography as of the photo-micrographer, the photo-astronomer, or any other investigator who joins photography to his aids to discovery.

Mr. Davison's defence of "suppression of definition," or "diffused treatment" in modern photographs, is somewhat discounted by the circumstance that it is studiously based upon almost purely personal predilections. He seems, indeed, by his declaration in favour of an individual preference in the matter of the focal treatment and tone rendering of photographs, rather to seek to avoid than to reopen or prolong the inevitable controversy as to the exact value of definition in photographic pictures. But, candidly, while complimenting Mr. Davison on his diplomacy, we cannot help remarking that, as the point is one which is of fundamental importance in the application of photography to artistic purposes, its discussion in the fullest and freest manner is highly desirable. Mr. Davison forgets that public taste has yet to decide between definition and no—or "differentiated"—definition, and we have little hesitation in conjecturing that, if the public preference is conclusively realised to be in favour of the former, the result, despite the small and temporary influence of outside critical impressionism, must lead to the relegation of non-focussed landscape and other kinds of work, to a position of artistic unimportance, if not neglect.

Mr. Davison's regret that the "broader treatment" advocated in former days has not survived is allowable enough, but, in venturing the opinion that "almost the only valuable artistic survivals from that period are in the particular broad focussing of Mrs. Cameron's powerful and original pictures," he perhaps does not exalt that lady's portrait work too high, but errs, we think, in omitting mention of the work of Robinson, Diston, Rejlander, and many others who for a long span of years were admitted to have worthily upheld photography as an exponent of the highest artistic capabilities. If, according to the President's personal leanings, their treatment was not "broad" enough, surely he does not on that score refuse to concede the artistic value of their work? The focal treatment of a landscape is apparently merely one of degree of breadth, determinable by the individual, but it seems strange that "breadth" and "narrowness" of treatment are in some minds artistically incompatible.

In discussing the inter-relations of science and art in artistic photography, the President arrives at a conclusion which he himself, by his able grasp of scientific progress in photography, does his best to destroy. Possibly the man who devotes himself to science and purely scientific habits cuts himself off, more or less, from the development of his artistic perception and knowledge; but a complete or a partial possession of one or both are by no means antagonistic. We have seen many excellent pictures on the walls of the Pall Mall Exhibition by the foremost man of science in photography to-day—we allude to Captain Abney—which quite disprove Mr. Davison's argument, against which, indeed, we are willing to quote that gentleman himself as a conspicuous witness. If we remember aright, Captain Abney, in the late Camera Club Conference, claimed that many artists would be all the better for considerable scientific knowledge. True enough, as his illustration of the extraordinary moons and mountains seen in some pictures amply testify. Your modern artistic photographer, whether of the "broad" or "narrow" school, must of necessity have a knowledge of photographic processes scarcely inferior to that of the scientific photographer pure and simple.

The concluding portions of the President's address, although written from the artist's standpoint, stamp Mr. Davison as

something more than an artist, and will be welcome to those who feared, and not without cause, that the majority of the Convention papers would entirely occupy themselves with the eternal art question, which is one of those things of which we conceive the most ardent disciple of the "suppression of definition" or "diffused treatment" school could have too much. The chief movements in photography during the past year are briefly described and thoughtfully reviewed in the address, although, to take one example, it seems to us a little premature to expect that "the great practical result of Messrs. Hurter & Driffield's admirable work" will be "the simplification of development for all photographers."

The President's address is throughout an admirable survey of many phases of recent photography, and it is entitled to the further compliment of the admission that it contributes plenty of matter for reflection and criticism alike. It will probably secure both.

DIFFICULTIES IN THE COLLOTYPE PROCESS.

If an opinion can be formed from the amount of correspondence we have received during the last few months, the collotype process—or, as it is termed on the Continent, Lichtdruck, and here passes under various pseudonyms—is receiving far more attention than hitherto. As in every process, so in this, those who take it up for the first time soon find that some little difficulties have to be encountered; and also that, when text books have to be solely relied upon, they are not so very easily surmounted. Hence, no doubt, the number of letters continually coming to hand recounting failures and asking their cause. From the meagre details usually furnished the questions are, in most instances, impossible to answer with any degree of certainty. To do that properly, not only should we require to know all the precise conditions under which the plates were prepared, but those also under which they were treated before printing in the press; in fact, to see all the operations performed. Usually, novices in any process are prone to attribute their failures to the formula by which they have worked, while the actual cause of trouble is rather in the conditions existing at the time. Notably is this the case with the process now under consideration, for its successful working really depends more upon conditions than upon mere formulæ.

In the abstract collotype is one of the simplest of processes. A ground-glass plate is prepared with a substratum, which acts as a bond between the glass and the printing film. This consists of bichromated gelatine, to which other substances are sometimes added. The plate is then exposed under a reversed—as regards left and right—negative, then washed and dried. It is then moistened again when it is ready for printing from, in the same manner as a lithographic stone is treated. All this appears simple enough; but there is no disguising the fact that to work the collotype process successfully, under the continually varying conditions of temperature and humidity of the atmosphere of this country, requires a certain amount of judgment, which can only be acquired by practice. Therefore beginners should not be discouraged by a few failures at first, as they are only what might be expected. With a view to the assistance of those experimenting with collotype, we will refer to a few of the more important points in connexion with the process.

One thing of great importance is the gelatine itself. One of its properties must be hardness, to withstand wear in the printing; while, at the same time, it must be freely absorbent of moisture. Generally, this characteristic is obtained by a mixture of two kinds—one hard and of an insoluble nature, and the other of a soft and absorbent character. The blending of two or more kinds in the right proportions to secure the end desired requires some little judgment. The proportions, however, that would be best in the winter would not be suitable in the summer, as the film would then be too soft, while what is necessary in summer would be too hard and non-absorbent in winter. However, a few experiments made from time to time with different samples of gelatine will determine the most suitable proportions of each quality to employ. As different batches of gelatine, even from the same manufacturers, are more or less variable, it is customary with those who work on a commercial scale to purchase a large quantity of the most suitable kinds at a time, and thus avoid unnecessary experimenting. The thickness of the printing film is of importance, as it affects the grain. But the experimentalist will soon be able to determine that most suitable for the work in hand.

A very important factor in the preparation of collotype plates is the temperature at which the printing film is dried, and this must be regulated according to the result desired—whether a coarse or a fine grain. The slower the plate is dried, and the lower the temperature at the time, the finer will be the grain, while, on the other hand, quick drying at a high temperature—within certain limits—is conducive to a coarse grain. If, however, the temperature is carried too high, and the drying effected too quickly, there may be an absence of grain altogether. The fineness, or otherwise, of the grain is also influenced, as we have just said, by the thickness of the film, as well as by the character of the gelatine of which it is composed. Hence it will be seen that no definite temperature for drying can be given, though it is sometimes done in text-books, as it is influenced by other conditions. It need not be explained to our readers that the granularity of a collotype plate is a reticulation of the film, similar to that which gave so much trouble in carbon printing many years ago, when the pictures were first developed on glass.

Next to the preparation of the plate itself, the most important point for consideration is the amount of moisture in the film at the time of printing. If too much is present, the ink will be rejected where it ought to "take," and if too little then it will adhere where it ought to be rejected. The proper hygroscopic condition of the film often proves a stumbling-block to beginners; in fact, really good printing plates are often condemned, though they have no other fault than being too moist, or, the contrary, not damp enough.

Some workers moisten the film with water alone, but the more general practice is, nowadays, to treat it with a mixture of glycerine and water, with the addition of a hygroscopic salt, such as the chloride of sodium or of calcium, "etching" the plate, as it is generally termed. When the atmosphere is very dry, more of the salt must be employed; but, when it is very damp, it often has to be omitted altogether; indeed, with glycerine and water alone, in very damp weather it is frequently found necessary to stop the printing, remove the plate from the press, and partially dry it by heat, owing to an excess of moisture being absorbed from the air while printing.

With beginners it not infrequently happens that a difficulty is experienced in getting the film sufficiently moist to reject the ink where it is not required. This may be due to the use of too hard and non-absorbent a gelatine at the onset, or to the

plate being kept for too long a time before exposure, so that the film has become insoluble or non-absorbent; or possibly it may have been over-exposed. An under-exposed collotype film will take moisture readily; a rightly timed one less so; and an over-exposed one only with difficulty, if at all. In the first case, trouble is met with in getting the ink to take on the film. In the last, it takes more or less uniformly all over the surface.

In the foregoing we have pointed out the principal difficulties, and their causes, that beginners are likely to meet with in essaying this most valuable process. The causes being known, the difficulties may then the more easily be overcome, or often avoided altogether.

DUST.*

The final aspect from which to scan this very fertile subject might be termed the chemical view, for it is with chemicals and solutions generally that it deals. In the "good old times" of wet collodion—"bad" old times the modern dry-plate worker would consider them—volumes might have been written on this one topic; for, of all things hurtful in wet collodion, dust was the most dreaded. Some of the present generation of photographers would look upon it as incredible, though it is strictly true, that at least one professional photographer had a glass cupboard constructed for the purpose, within which every plate was coated with collodion, solely to avoid the possibility of dust settling upon the film. But this is merely matter of history to the bulk of our readers, though it must not by any means be thought that wet collodion is no longer practised. One point requires far more attention, owing to its almost universal neglect—dust in washing waters. Almost every one who washes his negatives for an hour or two is aware of a fine deposit, which is rendered visible by passing a finger across the film, and the more careful workers rub each plate with a pledget of cotton-wool or some such soft material to remove this deposit, and give a final rinse before drying, that an even surface for varnishing may be secured. This deposit, in most cases, is neither more nor less than dust, though occasionally it may be traced to decomposition of the "hypo," and subsequent deposition of sulphur. Now, though it is a self-evident proposition that, the freer from dust all washing waters can be made, the better for the photographers, if it be asked how many workers take pains to guard against its admission, the reply would indicate a very, very small proportion. Are the vessels the plates are washed in kept covered? Are the tanks through which the water passes secured against the all-pervading enemy? Finally, is the water passed through a filter—coarse or fine—before passing to perform its duty? In very many cases, No!

If there is need for all these precautions in regard to negatives, doubly does the necessity exist when prints are in question, be they on albumenised paper, platinotype, developed gelatine, or carbon. It argues an extremely pure source of supply, and great care at every step against the entry of dust, when prints that have been washing in running water all night, or, indeed, a few hours, are quite as clean surfaced as when first put to wash. In many places, every print is carefully sponged and rinsed before drying, and, where many vignettes are the rule, it is absolutely necessary, where due precautions have not been taken, to perform this time-wasting work. Yet it need not be so. If every tank be covered, the washing vessel likewise, and the watered be filtered, either by one of the filters sold for the purpose, or even by means of a piece of very fine muslin or flannel, it will surprise those who have not tried the plan to find how pure and clean the prints will appear. But a word of caution. Any one endeavouring to take advantage of these hints must start with everything clean, which means cleaning out, to begin with all tanks and washing vessels before using the filtered water, and covering in all from the enemy.

So far, what may be termed mechanical dust has been dealt with; but thousands of prints and negatives are, we might almost say, daily marred or destroyed by what might be termed chemical dust. Where, as is often the case, the space is small and conveniences few for the manifold operations of the practical photographer, and, indeed, in all cases, an amount of care is needed in the handling of chemicals that is not often exercised. Hypo is spilt on the floor, it is wiped up with a towel, sponge, or cloth, and that very falsely is thought the end of the matter; for, as the "hypo" dries, a few fine crystals are left upon the floor to form one of the constituents of the ever-present dust. It is spilled upon the clothes of the operator, or his assistant, and again forms dust that may or may not fall upon a print or cling to the albumenised paper as it is hung up to dry. Innumerable cases of spotted prints, the blame for which is often thrown on the albumeniser, are produced from this one cause alone. Where the same room has to be used for all such purposes—sensitising paper, dissolving hypo, and other substances, weighing and measuring chemicals, and so forth, the utmost care should be taken to provide against any particle of chemical or drop of solution being spilled upon the floor. But of our own practical experience we are able to say that too often is the greatest carelessness displayed. A hundred-weight cask of hypo lies about; what matters one tiny crystal spilt upon the floor? A quantity of pyro is needed to be weighed in haste, it is rushed on to the scales, particles, perhaps left on the scale pan, and many of the slight fibrous crystals wafted in the air; and yet, if a spot appears upon a print done in paper sensitised in the same room, what surprise is expressed, and how the paper-maker is blamed! It may be truthfully said that the only marvel is there are so few spots, and that the loss from such causes does not mount up to quires of paper and dozens of plates, rather than the few that are heard of. Perhaps the destruction is greater than is really known. In conclusion, let us advise our readers to cover all tanks, filter all water, let not a crystal or drop of solution fall to the floor without being removed, and then some of the direst effects of dust will be avoided.

* Concluded from page 419.

An Electric Retoucher.—It is said that an electric pencil for retouching has been patented by a Rhode Island photographer. Retouching, it is claimed, will, by its aid, be made a very simple operation, and more quickly performed.

Converting Gallic Acid into Pyrogallol.—Mr. P. Cazeneuve sends a communication to the June number of the *Comptes Rendus*, in which he states that, on adding to gallic acid double its weight of aniline, the mixture congeals abruptly into a mass, with a rise of temperature. On the application of heat, aniline pyrogallate is obtained in long, instable crystals, from which the aniline may be removed by cold benzine and toluene, leaving pure pyrogallol. The melting point of pyrogallol is 132° Centigrade, and not 115° as stated by the text-books.

American Journalistic Amenities.—This is how the editor of the *Pacific Coast Photographer* writes of one of his con-

temporaries: "What a small, petty, picayunish thing the editor (or editress) of the long-titled sheet the —— is. It is a question in the minds of its seven subscribers whether a man or a woman is responsible for the editorial gibberings. No one knows; when we look at the cover we see on it a woman's portrait, but, if we *should* happen to look inside, which is seldom done by any one, we would be forced to notice an effervescence of petty bickerings and spite, which could never emanate from aught but a dyspeptic, rheumatic crank!" Hoity toity!

Toning in Thunderstorms.—In the last number of the JOURNAL a correspondent mentions that during the thunderstorm of June 28 his prints refused to tone up to the usual depth, whereas on the following morning, when the storm had passed away, the toning action proceeded as usual. We have examined the prints sent, and the difference in depth of tone, if not great, is at least appreciable. We have no experience of the implied influence of an atmosphere charged with electricity upon toning baths (by the way, our correspondent omits to describe the particular bath he employed), but it is at least conceivable that some such retarding action as that spoken of does take place. Perhaps some of our electrical readers can give an explanation of the phenomenon here assumed to be instigated.

Death of Mr. C. V. Shadbolt.—We are sorry to have to announce that Mr. C. V. Shadbolt succumbed on Friday last to the injuries which he received in the balloon accident at the Crystal Palace a fortnight ago. Mr. Shadbolt, who was only thirty-three years of age at the time of his death, had a well-deserved reputation as an intrepid and clever exponent of aëronautical photography, upon which subject he contributed a brief article to our ALMANAC for 1884, where he also made reference to Captain Dale, his companion in aërial adventure. In our issue for June 1, 1883, an article by the deceased gentleman on a similar subject will also be found, and, indeed, from time to time he contributed to our pages on a variety of topics of photographic interest. We are confident that the sympathy of all photographers will be extended to Mr. George Shadbolt and the family in their bereavement.

Removing the Yellow Tone of Gelatino-bromide Prints.—"Moncton," in the *Canadian Photographic Journal*, gives the following remedy:—Place the prints in a solution composed of a saturated solution of oxalate of potash, two parts; water, acidulated with acetic acid, one part. The immersion may last an hour or two, and the method is, says "Moncton," also efficacious for prints that have been made several weeks. The same authority also states that a one per cent. solution of iodine in equal parts of alcohol has a "fine effect." The action is the opposite to that of the bromides . . . iodine tending to produce reduction of contrast, and, if used to an excess, it will flatten the negative. "Moncton" says this is worth trying, as the effect is a very striking one. No doubt; but who wants flat negatives?

A Flourishing Photographic Society.—We are pleased to gather from the annual report of the London and Provincial Photographic Association that that body betrays the best possible signs of vitality in an increased number of members and a sustained interest in the papers and discussions which take place at its meetings. No small share of this gratifying result is due to the Honorary Secretary, Mr. R. P. Drage, to whom we are glad to find the members at the annual meeting passed a specially hearty vote of thanks. In the course of the coming autumn the Association is about to commence a series of lectures on the various branches of photography by recognised authorities, and those papers, together with the discussions thereon, will subsequently be published in book form. We hope with the Committee that this volume will prove the most complete *résumé* of photographic procedure up to date.

The Price of Silver.—Although, as a correspondent points out, metallic silver is very cheap just now, the margin between cheapness and dearness in this particular product is, after all, so small that it is difficult to see how any benefit worthy the name would accrue to photographers by manufacturers of many sensitive preparations adopting a sliding scale, for, at best, the advantage either way could but be fractional. The reason why sensitive paper remains at the price it was when silver was nearly double its present rate is not clear. Modern albumenised papers are, comparatively speaking, weakly salted and weakly sensitised, and we would therefore suppose, as our correspondent does, that they would be cheaper on several grounds. As a matter of fact, we believe sensitive paper is supplied to the trade on lower terms than was the case years ago, but the user of the paper does not always get the benefit of the reduction.

Decline of Intensification.—In the course of a brief but interesting discourse on intensification at the London and Provincial Photographic Association on Thursday week, Mr. J. S. Teape appeared to think that the intensification of negatives was not so much resorted to now as formerly, among his reasons for that opinion being the use of actinographs, &c., which he said guarded against excessive over-exposure, of slow and thickly coated plates for landscape work, backing, and emulsion papers. We are ourselves disposed to agree with Mr. Teape so far as general or every-day work is concerned and where the reservations he mentioned prevail, but the wide use of very rapid plates is, undoubtedly, still responsible for the necessity of strengthening the image in such a large number of cases that intensification cannot yet be regarded as likely to die out. The development of very rapid exposures so as to get the requisite degree of density is the *bête noir* of a great many photographers.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

EDINBURGH MEETING.

THE arrival of every train in Edinburgh on Monday signified an addition to the band of brothers and sisters of the Convention who kept pouring into the city all that day until, still some time before the commencement of the inaugural meeting at seven p.m., something like 230 names had been registered.

When Lord Provost Russell, in official robes, attended by several civic councillors and mace-bearers, and accompanied by some leading officials of the Edinburgh Photographic Society and of the Convention, entered from a side room the hall of the Royal Scottish Geographical Society, it was found that the place was already filled to overflowing, many ladies being present, several of whom had come from a considerable distance.

Mr. Hippolyte J. Blanc, Chairman of the Local Committee, and President of the Edinburgh Photographic Society, introduced the Lord Provost, and recognised his kindness in being present when he knew that other engagements claimed his presence elsewhere almost immediately.

The Lord Provost expressed the great pleasure it gave him in welcoming to the city of Edinburgh the Photographic Convention of the United Kingdom, who were exponents of the present state of photographic art. To realise the advancement photography had made since its early days, they had merely to compare the first Daguerreotypes with the exquisite productions of the present day. Some had said that photography could not be associated with the fine arts, but the sun was merely a brush by which a man produced his individuality on his photographic works. Referring to the possibility of producing photographs in the colours of nature, he said it was, even more than photography itself, in its infancy; something had been done, and much might be anticipated. There was no doubt as to what it was doing for science. Astronomical science in particular had been greatly indebted to photography, which had demonstrated the existence of suns and systems invisible to the eye even when aided by the telescope. However, their great pleasure would at present be in seeing photography developed as a fine art. He hoped the Convention would have a very happy time while in Edinburgh, and that the weather would prove auspicious for their projected excursions.

Mr. C. H. Bothamley, who presided in place of Mr. Bedford, the President, who was absent through illness, returned thanks to the Lord Provost for his welcome. Edinburgh was, both in itself as a city and in its surroundings, replete with historical subjects, which would afford ample themes for the exercise of their cameras during the week of the meeting, and the kindly welcoming of her chief magistrate was and would be much appreciated. He then introduced the new President, Mr. George Davison, who delivered the opening address.

PRESIDENT'S ADDRESS.

I WISH, at the outset of our Edinburgh meeting, to give expression to the lively feelings of interest and sociability with which, I am sure, photographers from all parts have come together to confer and fraternise with their comrades of the northern capital.

A PLEA FOR THE CONVENTION.

Of all the conventions, conferences, congresses, and association meetings which are organized to further the interests of various pursuits, none, I think, can be held to be more appropriate to a summer gathering than a reunion of photographers, whose practice naturally leads them at this season of the year so greatly to outdoor occupation; and at no place in the provinces more than Edinburgh, in itself, its surroundings and its photographers, could there be greater certainty of finding stimulus to artistic practice as well as to scientific inquiry in photography. It seems natural and right that photographers should gather in this sociable way each summer, and particularly happy that they should meet in this beautiful city on an occasion when the heads of the organization have signified in some sort their recognition of the artistic applications of photography by seeking as president our veteran in the art, Mr. H. P. Robinson, and, failing him, one younger, though not less enthusiastic in devotion to the same branch of camera craft. I have faith, then, that the cordiality and sociability, characteristic of the camera, will, in conjunction with a sympathetic seeking of the beautiful, be specially marked and remembered in connexion with this Edinburgh meeting. Notwithstanding the jealousies and quarrels of specialists, which indeed may be regarded as significant of superabundant life and energy, there is certainly a sympathy felt wherever a fellow-worker in photography is met. As the use of the camera becomes more and more universal, such sympathy and unity may become less and less noticeable, but in the early history of any pursuit they are an important factor in progress. It is to be hoped that, despite all passing dissensions and personal differences, photographers will always foster the fraternal spirit prominently witnessed in the very idea and existence of the Convention we are now holding.

On looking around at the general position in which photography is found to-day, I think there is room for satisfaction at the activity and promise displayed. Photography is extending its borders in every direction. In its capacity as handmaid to other sciences and arts, and in its industrial applications, there seems no limit to its utility. Directly, as a profession, or as a pastime, it also grows apace, and I can see little justification for the prophecy we have all heard that the rage for photography would die out as did that for rinking. So far from this being the prospect, photography, with its attendant incitement to the study of light, optics, and chemistry, its cultivation of the powers of observation, general and artistic, and as an indispensable means of record for travellers, has become a necessary concomitant of our advancing civilisation, and seems likely to extend its influence until the camera will occupy a place in every educated household as naturally as the piano and even, in some sort, will be made part of the ordinary education of every boy and girl.

PICTURE-MAKING NO WASTE OF TIME.

Having said so much in regard to the general outlook, I propose to direct my remarks chiefly to one particular aspect of our progress in photography, namely, the art aspect. It was, indeed, with some doubt and diffidence concerning my topic that I accepted the honour of the presidency of this year's Convention. In being called on to address the large body of practical and scientific men who impart life and usefulness to this organization, and, through them, to speak to many photographers as well as the general public, I felt I could say nothing in technical criticism of recent purely scientific advances or inventions in photography which would not have been already better summarised and explained. Apart from a general and popular interest in these improvements, such observations as I have been able to give have been, as you know, directed in a different channel, and it is only as these new developments and discoveries have seemed to me to have a bearing upon pictorial work in photography that they have had any great attraction for me, and that I feel able to discuss them. I shall have, therefore to ask for the patience of those who, by some misfortune in their constitution, hold that mere picture-making is a waste of time, and that it is only in its applications to science and the industries that photography should be seriously regarded. Despite the expression of such views, I deem it unnecessary, at this date, to argue that photography is capable of direct artistic application. Such a position, you will generally agree, it would be absurd to gainsay. The exact extent or limitation of the powers of photography in this direction is a very different matter. New means and new methods are being constantly introduced, and it will be best to leave it to time and steady effort to prove its capacity and its limits. I welcome, however, this public opportunity of renewing, to the fullest reasonable extent, the art claims of photography, and of inciting all photographers with artistic tendencies and ambition to inquire into and apply to their purpose every new means, method, instruments, or practice, which science can devise, or which their insight and needs call for and suggest.

"SUPPRESSION OF DEFINITION."

I think the state of photographic art at the present time is not without encouragement. It has passed through several phases. It started under the friendly auspices of recognised artists, many of whom seemed to expect that it would do, automatically, more than, even with training, it can be made to do; and later, when their disappointment came, it has suffered from an equally unreasonable excess of opposition from some of a certain class of painters, who, while using it, find it possible, at the same time, to roundly abuse it. Early in its history it discovered one or two who understood and mastered some of its powers, and that work remains a marvel of excellence and strength or a triumph of skill in the handicraft.

To-day interest in its development has been freshly roused by keen discussions as to the distinctive qualities of photography, as to the naturalness of certain methods of focussing, as to tone relations, and as to the qualities yielded by the several printing processes in respect of gradation, surface, quality, and colour. I am of opinion that there has been a great advance made, and that the improvement is still going on. It has been stated that the imparting of superior artistic qualities by the suppression of definition was an old idea, and had been ably and exhaustively discussed in London societies thirty years ago, and that the present movement would probably die out as that died out. I do not think this is a safe forecast. I have not thought it worth while to inquire how ably and exhaustively the matter was thrashed out, but I cannot but think it must have been a one-sided view, as far as the photographers in those societies were concerned, for none of them seem to have had the courage of their opinion to practically and adequately illustrate the broader treatment. It is a very curious circumstance that almost the only valuable artistic survivals from that period are in that particular broad focussing. I refer to Mrs. Cameron's powerful and original pictures, which, to-day, are universally admired. However, the present movement is not confined to matters of focussing, nor is it due to any individual, or clique of individuals. The general result of it is happy, in that many photographers have been set thinking and working, and more general and special recognition of the artistic powers of photography has resulted. Only a few days ago a well-known and very popular painter, referring to certain pictures of the class indicated, said to me that he wished he had one or two representative photographs of the kind for his painter friends to see. They were quite unacquainted, he said, with what was being done, and could be done, in this direction, by photography. Painters could not be induced to visit photographic exhibitions, and were prejudiced by the great mass of ordinary photographs which are displayed in the shops. In the same way Mr. Seymour Haden recognised in these photographs the power to seize on beautiful impressions of a subject, and secure what he termed painter-like qualities.

"DIFFUSED TREATMENT."

Do not let it be thought that I wish to arouse afresh any bitter controversy as to the relative merits of different kinds of focussing. Impressions differ, and truth and naturalness in these matters are as various and defensible as the likes and dislikes of different people. We shall do well to keep each of us to the truth that seems the best truth to us, after fully and fairly trying all; or, better still, to cultivate that frame of mind which leaves us free to apply any and every principle or plan as it seems best to suit the purpose in hand. I frequently see photographs which would be considered quite sharp, possessing most charming qualities, though generally in the direction of the beauties of the miniature or the somewhat rigid steel engraving. My own preference is greatly in the other direction. Photographs in various degrees and qualities of diffused and differentiated focus may still be deficient in some essential quali-

ties, but the general tendency of this treatment seems to me to leave open greater possibilities of securing the broad character of a subject, what has been referred to as painter-like qualities. I do not think it necessary to discuss in detail how far, or if at all, the beauty lies in the use of a rough-paper medium or in diffused treatment; I simply indicate that their tendency appears to me to be towards affording greater scope for, and likelihood of, securing the general sentiment, as opposed to a more detailed and decorative interest in the resulting work. It may be that this is merely a fashion, a conventionality in art; but, if so, the conventionality is there, good or bad, and it is certain that results by these methods best please those who have had artistic training. It is merely an accident—or a natural consequence, if you will—that these pictures are open to be mistaken, and are mistaken, for sepia drawings. In the same way, sharp and glossy photographs may be called imitations of the still older miniature paintings. No one method has a monopoly of all qualities. The artist in miniatures may have as much perception as the impressionist of broader treatment, although it be a different perception. It will be best, perhaps, to consult and abide by our individual preferences in this matter, as also in that of the much-discussed question of composition, where there may be a preference for the fascinating excellence and subtle combination and direction of line and arrangement of light and dark in spaces, or, on the other hand, for the charm of naturalness of effect and the spirit and character of natural scenes or incidents. The attitudes in the cultivation of these two excellences are somewhat opposed to each other, and the man who marries the two in his expression by painting, and without seeming effort, is the genius we may all conspire to worship.

Relation of Science to Art.

Here I am reminded of the very interesting discussion as to the separation or relation of science and art, which has recently gained some prominence in our societies and journals, and which seems particularly prompted in connexion with photography. The photographer, especially in a new and growing art, and one in which the tools are less simple and direct than in other more definitely handicraft arts, cannot afford to disregard any new weapon which seems to promise aid to his purpose, whether given by science or prompted by the practical necessities of other workers. At the same time, any interest in science or mechanical work, apart from its application to the one pictorial end purely, cannot fail to vitiate the character of the result from an artistic standpoint. The argument is the same as in the painter's art. There is a large tract in the domain of the artist altogether uninvaded by science, as the term is reasonably understood. A great painter may be practically scienceless; his knowledge of appearances may have been gained in an unscientific way, and better so. He sees, he knows; and the process of his observation and knowledge, and of the expression of his message, is at present past finding out. At the same time, it cannot be said that artists are better without science. It is, indeed, to their advantage to make use of every new fact and discovery; and art in the present day seems to require more and more erudition. An absolute scientific falsity is a distinct blemish. The case cited by Captain Abney of the painter who painted a rainbow inside out in respect of the sequence of colours, and then charged twenty guineas for setting it right, is a good, if apocryphal, instance. Mr. H. P. Robinson pointed out that the picture was not less beautiful in one way than in the other, and this is true as far as ninety-nine out of a hundred observers would be concerned; but, in so far as the painting is for all, and that spectrum analysts have probably still some slight interest in pictorial art, their feelings ought to be considered, and such a defect should certainly have been wiped out, and without charge. A picture may be great and beautiful in its truth or its fancy, in spite of many technical and scientific ignorances, but it would be better still without such blots. A great natural genius may, straight out of the heart of nature, draw beauties in a way that a student of the very latest theories of light relations, perspective, focus, colour, would miss altogether, but still it is of the utmost importance that all this knowledge should become part of the equipment of every new man who feels a mission to move our susceptibilities by graphic art. It stands out clear that for the average man the two paths of science and art lie apart or diverge. The man who devotes himself to science and to purely scientific habits and research thereby cuts himself off, more or less, from the development of his artistic perception and knowledge. The sciences of colour, and light, and biology, and the knowledge of kindred sciences necessary to master these, form a life work for any one man, as do also the science of appearances and the cultivation of the powers of expression and skill in selection and arrangement. Each man has his natural bent. Nature does not yet exhaust herself in one great stroke by reconciling in any one existence or work the seeming contradictions of science and art.

An Institute of Photography.

Adverting to somewhat more practical matters in connexion with recent photographic affairs and events, it is hardly possible to pass by altogether, on such an occasion as this, the temporary excitement which has been roused concerning a Photographic Institute, and other attempts to organize concerted action in the form of photographic surveys, geological, local, archæological. Some good work has been instituted in the latter directions by scientific associations, and by a few energetic provincial photographic societies, but it seems to be a matter of some difficulty to secure anything like combined action amongst photographers. Such an end can only be attained by associating those interested in the several applications of photography. The great schemes for an Institute of Photography, in which students could be adequately taught and trained in photo-mechanical processes, in industrial applications of photography, and in methods of scientific inquiry, seem unfortunately to have now been lost and forgotten, notwithstanding the admirable outline suggested in the paper read by Professor Meldola. If such a College or Technical Institute is to have promising initiation, the first steps must evidently be dissociated from any one association or clique, and even from those who might be called on for some support, namely, those directly interested in photography commercially. Speaking as a practical organizer, I think that with a purely scientific and practical body urgently called together, in the first instance, by such a committee as Captain Abney, Professor Meldola, and Sir Henry Trueman Wood, and chiefly composed of certain representatives from the leading scientific societies—astronomical, chemical, engineering, meteorological, and the like—a dignity would be imparted to the movement which would possibly secure wealthy, energetic, and influential support.

The initiation of a nationally useful enterprise of this kind might be held to come within the scope of the work of the Society of Arts, seeing that the movement is so intimately associated with progress in science and in art, and aims to fill a gap which constitutes a national misfortune. Under the auspices of an independent and powerful organization the undertaking should surely meet with success, and there would no longer be felt the frequent necessity for going abroad to find practical craftsmen in photo-mechanical processes. The question as to whether photographic art should be included specially as a study in the curriculum of such a college seems to be a matter of divided opinion. For myself I hold there is very great scope for teaching in this direction, and such an institution could not be considered complete without due provision for instruction in portrait and landscape picture-making. At the same time a *complete* photographic college with laboratories would be a great task to contemplate at the outset, and the first, and most probably self-paying, department which suggests itself is instruction in photo-mechanical processes. Probably one of the best introductions to the initiation of an Institute movement would be the holding of a fully representative photographic exhibition, in which the many applications possible to photography should be practically illustrated in separate scientific departments, and the art section placed separately. In face of a cry for a technical school of instruction in the industrial, scientific and artistic applications of photography, it is a matter for some surprise that such an exhibition, which would be the best practical evidence of the opening and scope for a teaching Institute, has not been arranged. I believe it would prove a natural and easy step to what is desired.

A Record Office—Photographic Exhibitions.

Suggestions have also been revived for the foundation of some kind of State record office, and the value of permanent photographs of many subjects, objects, and individuals in the future would, if judiciously classified, certainly be found to be as great as that of most printed and written documents, some of which, indeed, are priceless. But there seems to be great difficulty in making and centralising such collections, and each division of applied photography is left to make its own disjointed collections. There is a gallery, or portfolio, of photographic portraits of prominent men and women in course of accumulation, due to the initiative of the Amateur Photographic Association, and deposited, I believe, at South Kensington Museum. Such permanent photographs, more particularly if free from much, or any, retouching, should, in time, help to prove the need for a still more extended work in the same direction.

The subject of photographic exhibitions naturally finds a place in my remarks. I think the tendency in that respect must, from an artistic standpoint, be held to be satisfactory. The more it is regarded, the more, I am sure, it will be seen that any system of classifying artistic pictures, and judging and giving medals to them, is out of place and objectionable. The public interest which is now felt in all the leading exhibitions is quite sufficient to form an inducement in

those cases for exhibiting, and the smaller local exhibitions may be left for the moment out of consideration. The best argument to be adduced in support of this view is the success which has attended the International Exhibition at Vienna, the English Exhibition at Brussels, and the practical repetition of this latter at Lincoln, in all of which, by selection and invitation, a better average of excellence and a far greater credit to photography have been the result. In this connexion it will be remembered it has been a frequent custom to divide the art section of photography exhibitions into amateur and professional classes. For this, I think, there can be absolutely no defence if the exhibition has any pretensions whatever to be called an art exhibition. In art there can be no division of amateur and professional in the common acceptance of the terms. For the requirements of defensive trade union, or for club and general distinction, the division may be deemed advisable or not, but in art there is only quality—the good and the bad—whether the pictures be for sale or not.

Referring briefly to some recent inventions or introductions which appear to have some relation to art photography, we come first upon the great excitement of photography in natural colours. There is nothing practical as yet in this respect to deal with; but as two of our foremost photographers—one in science, the other in art—have, in the interests of artistic appearances, deprecated any such discovery, may we not ask why this should be so? Should we not rather welcome, with the keenest enthusiasm, a power of colour, confident of ability to avoid the commonplace and the mechanical, and of success in applying it to direct artistic purpose?

New Lenses.

In lenses there have been the tele-photographic combinations, introduced here by Mr. Dallmeyer, with which magnified pictures of distant objects, little short of marvellous, are produced, and which, in some cases, it is quite conceivable would be applicable to an artistic purpose. Quite recently the concentric lens of Messrs. Ross has been described and introduced, and this would appear to give the power of diffusion of definition, accompanied by rapidity. How the quality of the definition compares with that of the patient pinhole, I cannot say; but, as far as I have any experience, I have not yet seen any quality of definition so pleasing as that yielded in diffraction photographs, and I would strongly urge the more extended use of pinhole photography. In connexion with lenses for artistic purposes this opportunity may also be taken of drawing attention again to the use of large single lenses opened out to an intensity of *f*-4 or wider, as employed by Mr. Lyonel Clark for portraiture of large heads. The excellent results obtained by him certainly justify and call for a more general practice of the method. Under the head of control by means of lenses, I may refer in general terms to a method of local control, which, I understand, Mr. Van der Weyde has devised, and of which he will shortly give a full description. By this method the relative proportions of features in portraits or of objects in other pictures can be altered at will. The relative increase or diminution of parts can be carried to any extent, and it is evident that the process will be possible of both artistic and grotesque application.

Passing on one step, there has been considerable attention devoted to aids to exposure, particularly in Messrs. Hurter & Driffield's system, on the ground that only by exactly correct exposure can the true relative gradation of a subject be secured. Speaking merely from practical experience, in landscape work, however, the differences in general quality and character in prints from negatives which have received various degrees of over-exposure are not appreciable, provided that a thickly coated sensitive plate be used, and the development be arrested at the right time. The great practical result of Messrs. Hurter & Driffield's admirable work seems to me to be the simplification of development for all photographers. In regard to sensitive plates for the artist photographer, the tendency must, doubtless, be in the direction of thickly coated and orthochromatised plates used with screens. In regard to thick plates, what, as far as I know, is a new departure has been made by the introduction of a plate with emulsions of varying rapidities coated one upon the other, thereby giving great latitude in over-exposure, and greatly obviating halation, one of the most insidious and often unsuspected causes of trouble to the photographer.

New Printing Processes.

It is, perhaps, in respect of new and modified printing processes that the artist photographer of to-day can be most congratulated. No finer results have ever been produced in colour and general quality than the prints obtained by Mr. Lyonel Clark in working what is now known as his toning process in connexion with rough-surfaced papers. There is, however, the doubt of permanency; and the practical and uncongenial difficulties and uncertainties in the preparation of one's own paper are great objections for the artist, who requires all his attention in other directions. Similar appearances have been obtained in bromide papers, and, with the advantage of permanency in platinotype and carbon, and of the newer methods, the interesting kallitype process might, perhaps, be applied in the same manner. A striking novelty for the artist photographer is the method recently introduced by Mr. Willis of controlling the character and effect of platinotype prints by slow local development with a brush, the development being retarded by preliminary treatment of the print with glycerine. The beauty of some of the results by this means in the hands of a competent painter photographer is very noticeable.

Photo-Mechanical Processes.

Turning for one moment to photo-mechanical processes, there is not much that is new which would seem to have any special application to artistic photography. The use of photogravure by the general worker has not extended as was anticipated, owing, perhaps, to the practical difficulties to be surmounted, and to the greater satisfaction felt in the production of a single direct print superior in most cases in quality to what the engraving process would yield in numbers. As regards photogravures and other photographic reproductions of artists' pictures and drawings for framing and for journal illustration, there is still much jealous opposition amongst artists and some hangers-on of the press, who take their cue from these artists as to the quality of such reproductions. No doubt, in the cheaper processes, the general gradations of the picture may be modified if the loss be not obviated by special preparation of the picture; but, at the same time, there is retained in these processes or photogravure reproductions so much more of the character and originality of the artist than is seen in any but the very best wood or other engraving that there can, it seems to me, be no doubt about their becoming more and more used.

I have tried to indicate the state of photographic art amongst us. I think we may be proud that there is more interest in pictorial photography, and greater advance in this respect in our own than in any other country. It is hardly fair to form a judgment from the harsh, uninteresting, and even grotesque illustrations which are from time to time given in foreign photographic journals, as even those in our own photographic magazines are often very little better; but there are other means of judging of the standpoint in this regard of our brethren in France, Belgium, Austria, Germany, and America. I can only say it would be better, in all cases, if these ill-judged illustrations were omitted.

In conclusion, let me urge that we should not fail in keeping up and standing by the dignity and just claims of what we profess and practise. I think I see in the past a steady and even a rapid progress in art photography, and in the future a hope of still further advancement and of a better position. It is this spirit that has animated me in addressing you, and, instead of having to appeal for tolerance, I feel I may make bold to claim a fervour of agreement from you, a union against all enemies, and a combining to overcome all obstacles to our progress.

We shall be sustaining the true and fitting spirit of this Convention if we can all continue to advance together in the science, the art, and the good fellowship of our common object—photography.

Mr. Crooke, of Edinburgh, proposed a vote of thanks to the President for his very comprehensive address, in which so many phases of the art had been introduced. This was seconded by Mr. W. Lang, jun., of Glasgow.

The President, in acknowledging the vote, said that they had with them on that occasion some photographers from a distance, namely, Miss Catharine Weed Barnes, who represented photography in New York, and Dr. Mitchell, from Philadelphia. Mr. F. E. Ives had written to say that greatly to his grief he could not carry out his intention of being present and reading a paper, as had also Dr. Liesegang, of Germany.

Mr. J. Traill Taylor moved the thanks of the Convention to the retiring President, Mr. William Bedford. This gentleman, he was sorry to say, was unable to be with them on account of serious ill health, being prohibited by his doctor from leaving his room. Mr. Bedford has been most assiduous in attending to his duties; he was a man of great value, and emphatically one who was most excellent in counsel. He would couple with his vote of thanks one of condolence with Mr. Bedford in his present affliction.

Mr. Cembrano, Hon. Secretary, seconded this, which was carried unanimously.

Refreshments having been partaken of in an adjoining room, the

party thereafter assembled in the main hall, where a lantern entertainment was provided which occupied the time till a late hour.

On Tuesday morning a party of about ninety availed themselves of the first excursion, which was to Melrose and Dryburgh, under the leadership of Mr. Hippolyte J. Blanc, A.R.S.A.

It is at present a little difficult to say how many members are present at the Convention; but, from the number of names registered previous to the formal opening of the proceedings on Monday evening, a fair idea may be had. The greatest geniality and enthusiasm prevails, and the meeting is unanimously voted to be a great success.

On Wednesday morning a public meeting, for the election of the General Committee was held. Mr. Davison, President, occupied the chair. Those conversant with the rules of the Convention are aware that it is from this Committee that the Council are elected. Mr. Cembrano, Hon. Secretary, read applications from the Devon and Cornwall Camera Club, Plymouth, the Shrewsbury Camera Club, and the Photographic Society of Ireland, Dublin, each requesting that the Convention would honour their respective places by holding the next meeting there. Some discussion took place as to whether Plymouth or Dublin should form the next place of meeting, but seeing that a tacit understanding had been arrived at last year in favour of Plymouth, it was eventually, and unanimously, agreed that the meeting for 1893 be held in Plymouth.

The President referred to the readiness and grace with which the Lord Provost had inaugurated their proceedings, and to his address, which displayed an intimate acquaintance with the nature and scope of photography, and proposed a vote of thanks to him, which was carried by acclamation. Thanks were also proposed to the Trustees of the Board of Manufactures, who had kindly granted the use of the fine hall in which the meetings were held, and to the Edinburgh friends whose exertions had so greatly conduced to the success of this year's Convention.

Mr. Bothamley proposed, and Mr. Davison seconded a vote of thanks to Mr. Cembrano, the Hon. Secretary, whose labours had been very great and very successful. This elicited three cheers.

In responding, Mr. Cembrano said that he was gratified in being able to announce that in numerical strength the present Convention has beaten the record, the number of members being greater than that of any former year.

The following were elected as Council for the ensuing year:—

Bedford, W., London.
Blanc, H. J., Edinburgh.
Bothamley, C. H., Taunton.
Bridge, F. A., London.
Brigginshaw, J. J., London.
Carnell, A. A., Plymouth.
Cembrano, F. P., Richmond.
Cowan, A., London.
Drage, R. P., London.
Ewing, J., Aberdeen.
Evans, F., Chester.
Gibson, J. P., Hexham.
Handsworth, Worth, Plymouth.
Harding, Martin J., Shrewsbury.
Hastings, H. M., London.
Henderson, A. L., London.
Hepworth, T. C., London.
Keene, R., Derby.
King, Austin J., Bath.
Lange, Paul, Liverpool.
Lang, W. jun., Glasgow.
Levy, A. M., London.
Lucas, C. Phipps, Eltham.
Mason, George, Glasgow.
Mackie, A., London.
Naunton, W. W., Shrewsbury.
Porritt, J., Leicester.
Pringle, A., Bexley Heath.
Sayce, B. J., Liverpool.
Seaman, A., Chesterfield.
Smith, H. M., London.
Sturmey, H., Coventry.
Stuart J., Glasgow.
Taylor, J. Traill, London.
Tate, A., Belfast.
Turnbull, J. M., Edinburgh.
Warnerke, L., London.
Webster, G. W., Chester.
Wellington, J. B. B., Harrow.
Werner, A., Dublin.

The members thereafter proceeded to Princes-street Gardens, where some groups were taken by Mr. Alexander Ayton and others. The number present was very great, but the posing was effectively done by aid of the shelving rocks at the base of the Castle.

In the evening the following papers were read:—*Individuality in Photography*, by H. P. Robinson; *The Art of Photography in relation to Painting*, by A. Burchett; *Amateur Photography in America*, by Miss Catharine Weed Barnes; and *On the Training of Photographers*, by E. Howard Farmer. These, together with a description of the proceedings, will be given in our next. Fortunately, during the earlier part of the week the weather was fine.

Apparatus and Pictures.

The display of apparatus and pictures is not, numerically speaking, very great, but is unusually excellent.

In pictorial display first come the Eastman Company, who cover one end and a large portion of the side of the hall. Their exhibits mainly partake of the character of enlargements, which, speaking quantitatively, are the largest that have probably ever yet been seen. Their perfection is marvellous, especially seeing that there is but little of the work of the retoucher or finisher to be seen on them, one, indeed, *e.g.*, a view in Chiddingstone, by a former secretary of the North London Photographic Society, being absolutely untouched both in negative and enlargement. Several are from negatives by Thomas Fall, Lafayette, H. Yeo, and others in this country; and others by Van Bosch, Boyer, and other Parisian or French artists. This Company also exhibits a large collection of prints taken direct on their new chloride printing-out paper.

Morgan & Kidd show many fine enlargements from small negatives by Van der Weyde, and others. It is to be regretted that a catalogue of such exhibits is not specially prepared, as it would have greatly facilitated reference.

There are several carbon enlargements by M. & T. Scott, one of special excellence being a large group of more than a hundred figures by Alexander Ayton, jun., of Edinburgh, in which the posing (a difficult matter) has been happily managed.

There are also excellent enlargements by Elliott & Son, and by John Patrick & Son.

In apparatus there are lantern microscopic attachments by C. Baker; Wood's paper-cutter; a large collection of scientific apparatus, lanterns, and hand cameras, by Andrew H. Baird of Edinburgh; and an exhibition of lantern appliances in form of cylinders and pressure gauges by the Scotch and Irish Oxygen Company.

Messrs. Wray have a case of their lenses; but, as it is covered in, we can only surmise that they are of the same high-class character for which the productions of this firm are so well noted.

William Hume, of Edinburgh, exhibits enlarging apparatus of various kinds, including his Cantilever and Nimrod lanterns, the reputation of which has been long established.

Watson & Sons, of London, show their admirable Acme cameras, extensively fitted with aluminium metal work, which is both light and rigid.

Geo. Houghton & Son have a good exhibit, which includes their Shuttle haud camera, of which we gave a description quite recently.

As for kodaks, they are here in every size and form, together with the variegated productions of the Eastman Company, in the form of roll-holders, dark slides, spools, and other appliances. Mr. John Jackson at one end of a long table, and Mr. H. M. Smith at the other, were busy at the time of our visit in demonstrating to Edinburgh professionals and amateurs the toning and fixing of the Company's new paper, which appeared to give great satisfaction to those concerned.

Rodinal (the new developer) is also in force, and specimens are on exhibition, together with instructions for using the same.

The showroom attached to the hall being insufficient to contain the large exhibit of George Mason & Co., of Glasgow, this firm has opened special and temporary premises in Waterloo-place, in which to show their goods. These comprise all the novelties of the year, and include new American background stands, Morgan's graduated backgrounds, new American paper and mount-cutters, Ross's lenses (including the new Concentrics) in brass and aluminium, Zeiss lenses, Mason's patent tripod securers, instantaneous shutters by all leading makers, "Globe" nickel-plated burnisher, the "Amateur" burnisher (various sizes), cameras for studio and field (from quarter-plate to 24 × 24), Scovill's American studio cameras, tripod nets in which to lay holders and diaphragms, magic head screen, new head rest with ball and socket arrangement, Mason's lantern-slide "Binocular Photoscope," focussing glasses (numerous patterns), photographic chemicals, graduated measures, chemical balances, dark-room lamps, retouching desks, printing frames (in oak and mahogany), grooved fixing and alum troughs,

studio accessories—a large and varied selection, including cottage background, tree stump, balustrades, gate and wall, bird-cage, oak tables (various), chair (three backs), chair (four backs), electric bells, and telephones)—photographic literature, negative and print washers, developing dishes, camera cases and stands, studio stands of various patterns, new and improved enlarging lantern, aniline and other colours for tinting photographs.

Since writing the above, several additions have been made to the apparatus in the hall, to which we shall refer next week.

A NEW FORM OF ETHER-OXYGEN LANTERN.

[Royal Society of Canada.]

The difficulties commonly incident to the preparation and manipulation of the oxyhydrogen light have led me, after a series of experiments extending over many years, to devise and construct a form of optical lantern which may be quickly and easily operated with the least expense and danger, and in which compactness is secured together with an avoidance of excessive weight.

The apparatus has been designated the Ethoxycon, as indicating the use of ether and oxygen. It combines both the lantern proper and the gas generator and storage bag or receiver. In general terms, the generating and storage parts consist of a generator or retort for the production of oxygen gas, a filter or washer, a saturator, a regulator, and a storage gas receiver. All of these, together with the lantern proper, are contained in a box or case, which measures 10 × 18 × 18 inches. This also serves as a stand for the lantern when in use.

The details of construction and operation are as follows:—

The lantern proper, or the optical part of the instrument, consists of the ordinary lens system for enlarging, projecting, and focussing the image of the object as illuminated by rays of light passing through a condenser. These parts are all comprised in a small case of wood and metal, in which is placed a four-inch condenser, this size being ample to cover the aperture of an ordinary lantern slide three inches square. The back case of the lantern is provided with a sliding adjustment to establish the proper focal relations between the lens and the condenser. The spindle upon which the lime is placed is also provided with the usual means for transverse and vertical adjustment and adjustment of the jet relatively to the lime. An important feature consists of means for vertical adjustment of the entire instrument. This is effected by having the body hung on pivots at the summit of two metal triangles. From each pivot there depends an arm, carrying at its lower extremity a clamp operated by a thumb screw. This latter passes through and engages upon a short arc opening in each triangle in such a way that the body of the lantern may be adjusted horizontally, or vertically above and below this position within an extreme range of about 30°, the position desired being firmly secured by the clamping action of the thumb screws.

The generator consists of an iron or steel tube, with a semicircular cross section. Into the flat or lower side are inserted a number of copper cups, each of a capacity to contain sufficient mixture to maintain the light for about fifteen minutes. The different rates of conduction in the two metals of the retort serve two purposes. The copper, being a rapid conductor, brings about a speedy fusion of the chloride of potash, which quickly gives off gas. The iron, by its slower conductivity, serves to retard the transmission of heat from cup to cup, thereby prevents action taking place in any cup not directly heated, and secures complete control of the whole operation. Each cup is heated in turn by means of a spirit lamp or a small Bunsen burner, as may be desired, the transfer of heat from one to the other being effected automatically by an attachment which is operated by the receiver when the gas has reached a certain degree of exhaustion.

The washer, saturator, and regulator are combined in one piece, measuring 7·5 × 12·5 × 30·5 cm. This is placed directly beneath the body of the lantern between the triangular supports. The central longitudinal section is occupied by the washer. This consists of a tube arranged with fine wire cloth, and filled with a moist filtering substance, which serves to arrest any particles of carbon or other similar impurities which may pass over from the retort. On each side of the washer is a similar tube filled with pine-wood sawdust, which is charged with sulphuric or petrolic ether, as may be desired. The form of saturator is an improvement upon that usually employed, while the construction is such as to avoid all possibility of explosion. Towards one end, and directly over the washer, is a small standpipe with two stopcocks and a regulator. The latter consists of a rubber diaphragm, upon which rests a lead disc weighing about 136 grammes. The amount of gas passing through from the regulator to the burner is determined by the adjustment of two needle-point valves, one for each gas, and thus the production of a brilliant light is readily secured.

The gas-receiver is contained in the case which holds the entire instrument when in transport. It consists of a rubber bag, having a capacity of nearly one foot, the upper part of which is formed of a tin pan working upon two upright metal posts, one of which serves as a tube for the conveyance of gas to and from the receiver. Into the pan there is loosely fitted a second pan, designed to be filled with water in order to establish the necessary pressure. Upon the front edge of the first pan are a number of catches designed to engage a spring and automatically transfer the source of heat from cup to cup as the pan descends during the exhaustion of the contained gas.

To place the lantern in operation the case is located in the desired position and all the movable parts are removed. The loose pan is next filled with water to about two-thirds or three-fourths its capacity and placed in position. The rubber tube supplying gas to the receiver is next attached to its corresponding metal tube and passed through a hole in the cover made for this purpose, the latter being then closed down. Two metal rods projecting from the front of the cover are then drawn out as supports for the retort, and the lantern is placed in position on the top of the case.

Black oxide of manganese ($Mn O_2$) and chlorate of potash ($K Cl O_3$) in the proportions of 1 : 3 are now thoroughly crushed and mixed. If the crystals of chlorate are fine, thorough mixing with a spoon will suffice, but if large it will probably be found better and more expeditious to pass the mixture through an ordinary coffee mill. A metal trough of the form and length of the retort is now filled with the mixture, passed into the inverted retort, the whole reversed and the charger or trough withdrawn. In this process each cup will be filled, and any excess of material discharged as the trough is drawn out. The head of the retort is next firmly clamped on, the retort is placed in position on its supports, and the lamp adjusted to the first cup on the right. A large rubber tube is now connected with the retort at one end and with the washer at the other, while the small tube leading from the receiver is also attached to the washer. After making certain that all connexions are perfectly tight, heat is applied. If sufficient, gas will form in two and one half minutes, the first indications of which will be in a slight action of the receiver, followed by an elevation of the regulator to its full height. The pan now rises rapidly, and, under favourable conditions, the light should be on the screen within five minutes from the first application of heat to the retort. When alcohol is used in generating the gas, a somewhat longer time must be allowed for.

The distribution of the gas takes place in the following manner: As fast as it generates it passes from the retort to the washer, whence it returns by a smaller tube to the receiver, in which the surplus is stored. From the washer it also enters the standpipe and regulator, which latter determines a uniform pressure in the gas supplied to the jet, thereby securing a steady light. From this point, as regulated by the needle valves, the gas is led by two separate channels to the point of consumption. One valve transmits pure oxygen directly from the washer. The other causes a certain volume of oxygen to pass downward into one of the saturators, from which it passes into the second, and thence directly to the burner. In its course it becomes supersaturated with ether, and therefore constitutes the substitute for the ordinary hydrogen gas employed where separate gases are used.

The capacity of the retort is such that sufficient gas may be generated to operate the light continuously for about two hours. Two or more retorts will be found of advantage, and by their use continuous service may be secured for any length of time.

The exhausted charges may be speedily removed from the retort by placing the latter on end under a tap and using a free supply of water. If the latter be heated, the operation will be facilitated. If not immediately needed, the retort may then be placed on end with the mouth downward, to thoroughly drain and dry. No accumulation of moisture should be allowed, since it passes into the tubes, clogs the passage of the gas, and tends to produce a unsteady light.

The washing tube should be cleaned out occasionally with fresh water to prevent clogging. The saturator needs only occasional replenishing. With due attention to these directions and the ordinary prudence which must at all times be exercised in the use of highly explosive substances, this lamp is capable of affording a brilliant and satisfactory light, with perfect safety to the operator and a minimum of expense and trouble. The cost of operating the lamp, so far as can be determined from present experience, is about fifteen cents per hour.

The apparatus is patented in Europe and America.

George R. Prowse.

Our Editorial Table.

A Photograph and How to Take It.

By "One Who Knows." Thirty-second edition.
London: E. G. Wood, 74, Cheapside.

Within the space of some twenty-eight pages this booklet gives a number of practical hints that are likely to be of assistance to a beginner. The remainder of the work is devoted to a catalogue of the firm's stock of apparatus and chemicals.

The Photographic Record.

The July number of this publication, which is the (quarterly) organ of the Manchester Photographic Society, has a portrait of the Society's President, and besides useful papers on the *Carbon Process* (by W. T. Wilkinson), *Cresco-Fylma* (W. H. Shirley), *Gelatino-Chloride* (H. Wade), all read before the Society, includes some readable "general notes" and descriptions of "rambles," &c. The Question Box is an instructive feature.

We have received Fallowfield's *Remembrancer* for June and July. It is, as usual, an accurate record of the latest novelties.

Société des Amateurs Photographes (Paris) Annuaire Formulaire Illustré, 1891–92.

This tiny annual gives a history of the Society and, besides its rules and other matter of interest to members, a number of formulæ for development. It seems that even a photographic society abroad requires the authorisation of the Prefect of Police to exist. This is one of the things we manage better at home.

British Mosses.

By the Rt. Hon. Lord Justice Fry.

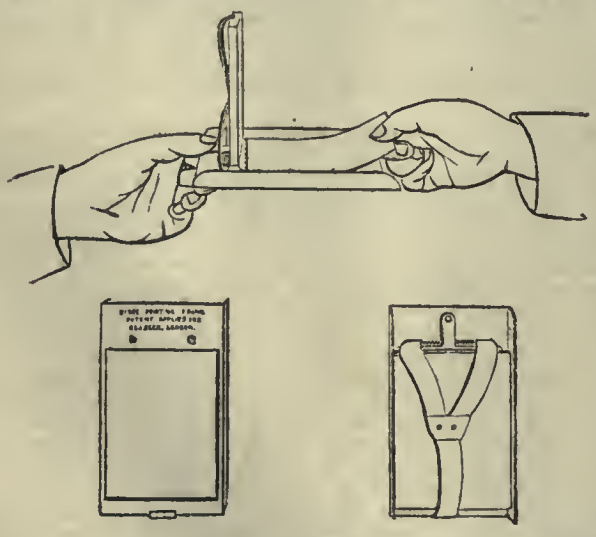
"Knowledge" Series. London: Witherby & Co., 326, High Holborn, W.C.

This is a painstaking study of British mosses, arising out of a lecture originally delivered at the Royal Institution in January 1891, the expanded papers thereon being reprinted from the pages of our contemporary *Knowledge*. The author deals with the classification, life history, modes of reproduction and organization of mosses, the chapters being admirably illustrated by Miss Agnes Fry. In a concluding note Sir Edward recommends the study of mosses to nature lovers, and winds up by a few simple directions as to how to begin that study.

The Bynoe Printing Frame.

London: R. & J. Beck, 69, Cornhill.

The advantages of being able to watch at one view the progress of printing, of ensuring optical contact however many times the print is



looked at, and of getting an even pressure over the whole surface of the print are only possessed in an imperfect degree by most printing frames. The neatly constructed piece of apparatus now before us is designed to secure these and other desiderata.

As may be gathered from the cut, the negative and sensitised paper upon being placed in position in the frame are gripped by a strong clip about the eighth of an inch from their ends, and are held firmly together, entirely independent of the pressure board at the back. This is said to give perfect freedom in the examination of the whole print, which remains immovably fixed until a small lever is pressed by the thumb. An even pressure is obtained by a hinged spring, which presses the centre of the back board and is automatically fastened down by a catch. The "Bynoe" printing frame embodies a clever idea, ingeniously executed, and possesses many claims to supersede the inefficient printing frame in common use.

The Photographer's Companion.

By Edward Dunmore.

London: Henry Greenwood & Co., 2 York-street, Covent Garden.

The sub-title of this work indicates that it is a collection of hints, expedients, and formulæ, systematically arranged as a supplementary reference book for use in the studio and dark room. In casting it on those lines, the author may congratulate himself upon having covered ground not hitherto invaded by photographic writers. The practical essentials and difficulties of most processes, ancient and modern, are fully, but not diffusely, discussed, and a good deal of serviceable information provided for those emergencies which are sure to arise in photographic procedure. The chapters on "Photographing Interiors," "Artificial Light," "Out-door Work," "Home Portraiture," "Copying," and "Composition Printing" are of particular value, but the entire work is of special interest to the practical photographer, and in that sense will, doubtless, be welcomed by both professionals and advanced amateurs alike. It is published in paper covers at 1*s.*, and in cloth at 1*s.* 6*d.*

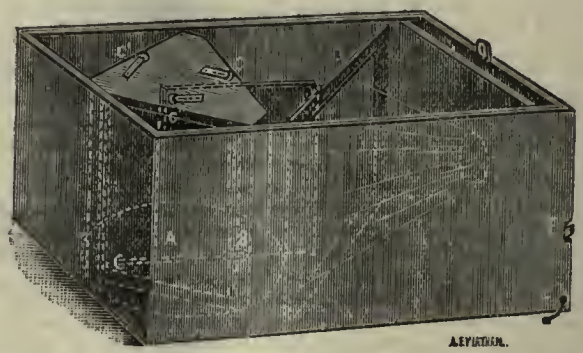
The "Surprise" Hand Camera.

Joseph Levi & Co., 40 Furnival-street, E.C.

There are certain features about the Surprise which entitle it to be regarded as a novelty, even in these days of ingenious hand cameras. It carries six plates or films, which are held in wooden carriers forming the three vertical sides of a revolving triangular prism, the carrier being double, thus holding a plate on each side.

The hand or arm A revolves the prism upon its axis, and brings in turn each side parallel to the front of the carrier.

After the front plate has been exposed, the hand B is turned round,



as shown by letter C, so as to bring to the front the plate No. 2, which was on the inner side of the camera. Care must be taken to always turn the lever A from right to left to ensure the proper and easy working of the apparatus. The same remarks apply to B. This mode of changing allows plates of various rapidity being used in the camera at the same time, and expose at will.

The back part of the camera is made absolutely light-tight by the mask, hinged on one side of the box and adjusting itself to each plate which is brought to the front for exposure. The price of the camera is 1*l.* 1*s.* It is cheap, novel, and ingenious.

The Strand Magazine for July.

London: George Newnes, Southampton-street.

The *Strand Magazine*, in its July number, in addition to a large assortment of exciting fiction, admirably illustrated, has instructive articles on "The Evolution of the Cycle" and "The Raising of the *Utopia*." The subject of Mr. Harry How's tactful interview is the prince of journalists, Mr. George Augustus Sala. The *Strand Magazine*, like the thoroughfare from which it derives its name, is always animated and interesting.

The Photographic Quarterly for July.

London: Hazell, Watson, & Viney, Creed-lane.

A seasonable illustrated article, by Mr. E. J. Humphreys, on "Life on the Broads," relieves by its chattiness the heavy, though excellent, bill of fare of the July number of the *Quarterly*. "Some Points on Exposure," by Mr. A. Watkins, and "A Recent Improvement in the Manufacture of Oxygen Gas," by Mr. Clement J. Leaper, are among the articles given.

RECENT PATENTS.

PATENT REPRINTED.

1890.

No. 13,631.—"Photographic Cameras." Ramsperger.

PATENTS COMPLETED.

Improvements in Frames for Photographs, Pictures, and the like.

No. 228. John Percy King and Henry William King, 222 and 224, Goswell-road, London.—*June* 11, 1892.

This invention relates to frames for pictures, photographs, and the like, and has for its object to provide improved means for introducing and removing photographs and the like into and from such frames.

According to our invention the frame is provided with a bezel, to which is hinged a lid forming the back of the frame, which lid is grooved or recessed to fit over the edges of the bezel to exclude dust. The hinge consists of a spring pin or bar attached to the lid, and having its two ends passed through holes in the bezel, and bent to form rings or eyes by means of which the frame can be suspended.

These holes through which the ends of the pin are passed are slightly out of the axial line of the pin, so that the normal tendency of the spring will be to retain the lid closed, the flexibility of the pin allowing the opening of the lid. The said spring-pin also serves to draw the said lid, so that a catch thereon engages with a notch or the like in the bezel.

At the back of the lid is a leg or strut for supporting the frame at an angle upon a table or the like. A spring is also placed inside the lid in such a manner that, when the lid is closed, the picture or the like will be held against the glass of the frame.

A Method or System by Means of which Pictures Projected upon a Screen from an Optical or Magic Lantern or Lanterns are Seen in Relief, or with Stereoscopic Effect.

No. 11,520. John Anderton, 142, Suffolk-street, Birmingham, Warwickshire.—*June* 18, 1892.

Two views or pictures of an object are taken in the direction in which it would be viewed by the two eyes, by photography or other means (as taken for the stereoscope), and these pictures are placed in an optical or magic lantern with two separate objectives, or in two or more separate lanterns.

Into the optical system of each objective or lantern is introduced a Nicol's prism, reflectors, plate of tourmaline, or any other material or apparatus that will polarise the light, and these for simplicity, say two Nicol's prisms, are so placed that the light will emerge from one lantern polarised in a plane at a right angle to that emerging from the other.

These two views so polarised are superposed upon a screen of ground glass, or any other material that will not depolarise or elliptically polarise the enlarged image or representation of the two views projected upon it.

The superposed views are viewed by the observer through a pair of analysers of Nicol's prisms or any other substance or system capable of effecting same, and these—say, Nicol's prisms—are placed with their planes of polarisation at right angles to each other. The one prism will permit the one picture that is polarised in the same plane to reach, say, the right eye, and will prevent the second picture from falling upon it; whilst the other prism, having its plane of polarisation at a right angle to the first, will permit the other picture, *i.e.*, the one that is polarised in the same plane, to reach the left eye, and will prevent the second picture from falling upon it.

There is then (as the pictures are already superposed upon the screen, and as upon each eye a different picture or view falls upon corresponding portions of the retina) all the conditions under which the effect of stereoscopic vision is produced, and therefore the combined picture appears in relief, giving the impression of actual solidity to the observer or observers.

By this method or system the colours of the pictures are not in any way affected.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I wish it to be understood that I do not limit myself to the more precise details herein set forth, as I may sometimes vary the same to suit different requirements, at the same time adhering to the main principle of this my invention. I declare that what I claim is:—The scientific arrangement of the several parts constituting an apparatus for giving, by polarisation, or partial polarisation of the light, a stereoscopic effect to pictures, and such like, projected upon a screen or elsewhere, and forming thereby a method or system by means of which such pictures or other objects being so projected from an optical or magic lantern or lanterns are seen in relief, substantially as herein more fully set forth and described.

Improvements Connected with Photographic Cameras and Stands.

No. 13,[illegible]. Archibald Campbell, Southwell House, Southwell-gardens, London, S.W.—*June* 18, 1892.

My invention consists of a photographic camera fixed to and forming the handle of a stick in the manner to be described, and forming a combination which may be used as a walking-stick. The axis of the lens is at right angles or nearly so, with the line of the stick, which bears on its end a conical pointed ferrule or spike by which it may be fixed in the ground.

The handle, containing lens and forming the camera, is of an egg shape (about the size and shape of a guillemot's egg), and is fixed on the stick near its smaller end. The "lens" slides in an "embracing tube" or cylindrical aperture in the smaller end of the handle in such a way that if pushed home (in focus for distant objects) the back of the lens will be vertically over the centre line of the stick, or nearly so. For focussing objects very close at hand the lens can be slid forward in its "embracing tube," distances being marked on the tube into which the lens or lenses are screwed ("lens tube"); so that if a mark, say, three feet, is just uncovered by the end of the "embracing tube," the lens will be "in focus" for objects at that distance from it. The lens can be slid right out of its "embracing tube" and used, in conjunction with a separate "enlarging apparatus," for producing enlarged positives from the negatives taken in the camera. The lens tube has a slot, through which diaphragms with various apertures may be inserted. In order to insert them the lens tube must be pulled half out of the embracing tube until this slot is uncovered. The diaphragms are made so as not to project outside the lens tube. A sensitive plate or film is placed at the larger end of the egg-shaped handle, the changing of plates or films being accomplished by hand, or by an automatic "changing box" or "roller slide." The method I prefer for changing plates (square, rectangular, or round) by hand is by means of a "changing bag" of some "light-tight," flexible material, having two apertures, the one to admit the larger end of the egg-shaped handle, and the other for the hand of the operator. The former aperture is made light-tight when the bag is in use by a stiff ring covered with velvet on its inside, and the latter by elastic bands closing round the operator's wrist. With this arrangement I make the larger end of the handle a removable cap, fitting on with a "bayonet joint," the plates being kept in a box within the changing bag.

The removal of the above cap and changing of plates is done by the hand of the operator inside the bag, the cap being replaced before the bag is taken off. The plate, when in position, rests with its four corners in notches cut in a projecting ring in the interior of the handle.

The handle is hollowed out to allow of the free passage of light from the lens to the sensitive surface, the "instantaneous shutter" (presently to be described), being supposed open. The smaller end of the egg-shaped handle consists of a removable cap covering the lens and fitted to the rest of the handle by a "bayonet joint."

A shutter with an "up and down" motion works in grooves immediately behind the back of the lens, and in a plane at right angles with the axes of the lens. These grooves extend a short distance down into the upper part of the stick, which upper part may be of metal tube such as brass, and of an internal diameter greater than the diameter of the back lens.

The up and down motion of the shutter is produced by a crank capable of being revolved by a spring. The shutter is connected to this crank, either directly or by an intermediate connecting rod.

The crank axle revolves on an axis parallel to the axis of the lens, its bearing being in a block fixed to the inside of the hollow upper portion of the stick. This block contains also, vertically above the bearing of the crank-axle (the stick being supposed vertical), the bearing of a catch, by which the shutter may be released (and the "exposure" made). The axles of both crank and catch project on the outside of the stick, a short distance under the larger end of the handle. The projection of the crank-axle bears a small button, by which the crank may be revolved by hand in a direction opposing the tension of the spring by which it is actuated, and so "winding up" the mechanism.

The catch directly releases the crank, and serves also to check its motion after one revolution. In order to effect this, it is made in the form of an ordinary clock escapement, with two short curved arms, one on each side of an axis, so that when one arm is on a level with the top of the crank, and about to release it, the other is below the crank, and in a position to intercept it. In the normal position of the catch, the latter arm stands clear of the crank, and the former intercepts it. This position is maintained by a spring. The projecting end of the catch-axle is bent round, so that an upward pressure of the finger raises the arm holding the crank, and releases it. The crank will then revolve, and the shutter will uncover and re-cover the back of the lens. If the finger be removed, and the pressure again applied, the crank will revolve once more. Each revolution will be slower than the last, until the actuating spring is slack, when the crank should stand in its lowest position, with the back of the lens exposed. This is the position in which "time exposures" are made, by means of the cap covering the front of the lens, which is kept uncovered during an "instantaneous" exposure. The actuating spring may be a spiral, with the inner end fixed directly to the crank-axle, and the outer to the bearing-block. Or it may consist of a straight helical spring, extending down a hole in the interior of the stick, and rotating the crank by a thread wound round a drum on the crank-axle. The end of the spring not attached to the thread may be fixed to the lower end of a rod, or stiff wire, fastened at its upper end to the bearing-block, and projecting down the centre of the spring.

The speed of the shutter is increased by "winding it up" (rotating the crank), or diminished by successive pressures on the catch. The whole mechanism of the "instantaneous shutter," described above (with the exception of the "vertical grooves"), is fixed to the "bearing block," and is thus easily detachable. The metal portion of the stick, to the interior of which the bearing block is fixed, screws or slides into a socket fixed to the lower part of the stick. (The upper hollow portion of the stick must be sufficiently large to allow of the free revolution of the crank.)

The "camera and shutter" may be detached from the socket and lower portion of the stick and fitted to some form of tripod stand, which may be constructed to fold up into the form resembling a stick.

But for ordinary use the spike (previously mentioned) will be found a sufficient support. As to material, I prefer to make the "handle" of the stick, as well as the actual shutter of the "instantaneous shutter" of ebonite. The stick may be of wood stained black, with an iron or steel spike., the upper or hollow portion of the stick, and the "embracing tube," "crank," "catch," and "lens-tube" of brass, bronzed black on the outside.

Having now particularly described and ascertained the nature of my inven-

tion, and in what manner the same is performed, I declare that what I claim is:—1. The combination of a photographic camera of small size with a stick in such a manner that the combination may be used as a walking-stick, substantially as herein described. 2. The combination of a photographic camera adapted for both "time" and instantaneous exposures" with a stick forming the stand thereof in such a manner that the combination may be used as a walking-stick, substantially as herein described. 3. The combination of a walking-stick having a pointed ferrule or spike with a photographic camera, and forming the stand thereof, substantially as herein described. 4. The improved instantaneous shutter and release-catch, substantially as herein described.

Improvements in the Manufacture of Colours, specially applicable for Colouring Photographs.

(A Communication by Carl Heinrich Wilhelm Bruns, Halberstadt, Germany.)

No. 3791. Alfred Julius Boult, 323, High Holborn, Middlesex.—*June* 18, 1892.

Although the colouring of photographs is both a lucrative and pleasant occupation, specially trained people only have hitherto been able to devote themselves to it, chiefly for the reason that there have been no colours exactly suitable for the purpose, either the ordinary oil colours or water colours having been resorted to. It is, however, a fact, that these colours do not, without difficulty, adhere to the surfaces of photographs which have been fixed, glazed with collodion, and generally treated for photographic purposes. It is therefore necessary to submit the colours to certain rather complicated preparatory operations—for example, to mix them with certain liquids, the nature of which is, in many cases, the secret of the individual artist performing the work. Besides, the colours hitherto used always entirely cover and conceal from view those delicate shades which form one of the peculiar advantages of photography, so that the general effect of the photograph, after colouring, is spoiled, as in no case is it possible to convert a photograph into a real oil painting. When coloured photographs have to be subsequently varnished with collodion, or otherwise glazed, it has generally been found that the colours were unfit for the reception of such varnish or glazing, and that the whole picture was spoiled in consequence.

The new colours obtained by the process, which forms the subject of this invention, enable photographs to be coloured without requiring any preparatory operation. The colouring of photographs is thus placed within reach of the general public, and is not confined to professional hands, and any lover of such work can colour a photograph in a few minutes. The original shades of the photograph are not only not concealed but rendered more prominent, and the resulting pictures present the appearance of a water-colour painting, which in colours is the nearest approach to photography, the glossy and yet somewhat dull colouring admirably suits the nature of a photograph. The colours adhere to any photographic surface whether or not treated with collodion, and if the picture be collodionised or glazed afterwards it is in no way damaged. These colours, which the inventor describes as "transparent glazing colours," are prepared in the following manner:—

Caseine, entirely freed from fatty substances (say, by means of the Soxhlets fat-extracting apparatus and by treatment with sulphuric ether), is allowed to dry for about twelve hours, during which time the ether that may have been left in it evaporates, and the caseine becomes fit for the subsequent treatment. In about 1250 grammes of water, on the other hand, 110 grammes of borax are dissolved. This solution is mixed with one kilogramme of the prepared caseine. Then, while the mixture is continually stirred, it is heated to the boiling point; but a moment before the boiling point is reached the stirring is discontinued, and the impurities rising to the surface are removed by means of a skimming ladle. After allowing the mass thus skimmed to boil a few minutes longer, it is cooled in a water bath.

The result is a liquid which, by being thoroughly mixed with the desired colouring matters, will produce colours for photographs such as have been above described, and which may, moreover, according to requirements, be mixed with or diluted in water without undergoing any alteration as regards their essential properties.

Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, as communicated to me by my foreign correspondents, I declare that what I claim is:—1. The manufacture of colours suitable for colouring photographs, and capable of adhering to paper treated for photographic purposes, consisting in dissolving the colouring matters in, and mixing them with, caseine, boiled in water, with the addition of borax, substantially as described. 2. The herein-described manufacture of colour, suitable for colouring photographs, substantially as described.

Improvements in and connected with Stereoscopic and other Photographic Cameras.

No. 10,278. Etienne Ricard and Jean Baptist Joseph Lacroix, Agen, France.—*June* 18, 1892.

The present invention relates to a new and improved photographic camera which we prefer to term the "Velocigraph."

The camera has the peculiarity that, while it is in reality a magazine camera or a camera for a number of plates, it has no changing box or dark slide, or any distinct compartment for the plates, these latter being inserted directly into the camera in a vertical position and fall down horizontally and automatically on to the bottom of the camera after they have been exposed.

The apparatus is provided with a cap or cover in front which when closed protects the objective and the mechanism adjacent to it. The back of the camera is also provided with a second cover or cap to which is fixed or attached a strap which engages with a hook by means of a loop or buckle. The perfect closure of the front and back of the camera is ensured by pressing down the hook and so closing the lock to which it is connected.

The mechanism of the camera consists of a lever arm or handle for setting the shutter, a catch for liberating it, and an arm for regulating the velocity.

The shutter consists of two half shutters, or sectors of sheet metal, or other suitable material, each having a similar aperture, and both placed one upon the other and moving freely on the same pivot, which is further provided with a bent or curved rod, engaging with a part of one of the sectors, which is bent back upon the lower edge of the other sector. The result is that, when the setting handle is turned in one direction, the bent rod turns at the same time, carrying with it the sector with which said rod engages, and consequently also the other sector, the notched edge of which engages with a detent. The shutter having been in this way set without uncovering the objective, the setting handle is released and returns to its original position, owing to the action of a spring, as also does the bent rod.

To liberate the shutter, it is merely necessary to press upon the catch, which raises the detent and liberates or sets free one of the sectors, and permits the latter to be returned to its original position by a spring which, preferably, winds itself on a pulley keyed on to an axle. The aperture in one of the sectors passing in front of the objective allows the light for the instantaneous exposure to enter the camera.

One of the sectors is furnished with two notches in its edge. The first of these is for time exposures, that is to say, when it is held by a detent opposite the objective fully exposed. The second notch is for instantaneous exposures, as has been explained above.

The velocity of the shutter is regulated by moving the end of the before-mentioned arm along its graduated quadrant. This pointer is provided with a point; it is drawn forward a little and the point inserted in one of a series of holes in the graduated quadrant or plate. This operation having caused the pulley inside to rotate, a greater or less amount of tension is produced in the spring which is wound on said pulley.

The plates or films are first introduced into a dark slide of metal or other material, and are placed vertically in the back part of the chamber. They rest upon two blocks, and are constantly pressed forward by a spring-controlled rod. They are kept in position at their top part by a suitable anchor or stop with two teeth, the action of which will be described below.

To fill the apparatus the back end must be raised and the spring-controlled rod drawn back. For this purpose a pawl is caused to act as a brake by pressing upon its prolongation; this pawl then assumes a position in which it is retained by a spring which is in contact with a pin. The spring-controlled rod is then drawn back, and when it has arrived at the end of its course the pawl extension strikes against a tappet or stud which tips it up.

The whole arrangement remains of itself in the position it now occupies.

The apparatus having been filled, the spring-controlled rod is moved forward by hand, the pawl disengages with the tappet, and falls into the toothed sector.

Each plate is removed as soon as it has been exposed, the spring-controlled rod presses the plates forward until they have all been used, at which time further forward movement of the rod is prevented by a suitable stop.

The teeth of the sector serve as a break to prevent backward movement of the spring-controlled rod, and consequently of the packet of plates, when the camera is being worked.

The mechanism for changing the plates, forming the principal part of our invention, consists simply of an anchor very like that used in the escapement of a clock, and worked directly and simultaneously with the shutter by means of the lever arm. This anchor consists of an axle furnished at one end with a finger and at the other with two teeth, forming the anchor properly so called. When at rest, one of the teeth keeps the pile of plates in position, while the other tooth is sunk in the top wall of the camera. It is easy to see in what way the change of plates is effected. The first of the plates having been exposed, the apparatus is inclined slightly forward, and the shutter is set by means of the lever arm. The result of this movement is that a rod presses upon one of the fingers by means of its bent extremity, and in this way causes the axle to turn; the result is that one of the teeth is inserted between the first and the second plate, while the other tooth, sinking into the wall of the camera, allows the first plate to escape, which turns forward upon its base and, being guided by curved plates, falls upon the bottom of the camera.

When the shutter has been set, the setting arm is allowed to return to its original position, and one of the teeth rises, and the other tooth, taking up its original position, supports the plates, which are pressed against it by the spring rod, the axle on which the latter turns being provided with a toothed sector, which causes an indicator to turn, and enables the operator to see at any moment how many plates are still at his disposal.

To set the shutter without changing a plate, a case which necessarily occurs when the first plate after the filling of the camera is to be exposed, the setting arm is turned until the second notch in the shutter sector is engaged with by the detent, and it can easily be heard when this takes place, and the pointer is allowed to turn backwards. By this action, the anchor operating rod not having been moved sufficiently to let one of the teeth escape, none of the plates can fall.

To prevent the plates which have been exposed from moving about in the bottom of the camera when it is being carried, the setting arm is turned in the opposite direction; the prolongation of the bent rod on the shutter pivot then pushes a cushion which, being jointed, presses on the edges of the plates and keeps them in position between the cushion, which may be of thick soft leather, and blocks covered with soft leather.

Our system is equally applicable to stereoscopic cameras. Then the partition which divides the camera longitudinally into two equal portions is rendered movable to enable the plates to fall; this partition is soldered to the axle carrying the anchor or teeth in such a way that when the shutter is worked the said axle is caused to turn, the partition rises at the same time, and cannot prevent the plate that has been exposed from falling to the bottom of the chamber.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
July 18	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 18	Hastings and St. Leonards	
,, 18	Leeds (Technical)	Mechanics' Institute, Leeds.
,, 18	South London	Hanover Hall, Hanover-park, S.E.
,, 19	North London	Wellington Hall, Islington, N.
,, 19	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 19	Southport	Shaftesbury-buildings, Eastbank-st.
,, 20	Bury	Temperance Hall, Bury.
,, 20	Manchester Camera Club	Victoria Hotel, Manchester.
,, 20	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 20	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 20	Southsea	
,, 20	West Surrey	St. Mark's Schools, Battersea-rise.
,, 21	Brixton and Clapham	Gresham Hall, Brixton.
,, 21	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 21	Oldham	The Lyceum, Union-st., Oldham.
,, 22	Cardiff	
,, 22	Holborn	
,, 22	Maidstone	"The Palace," Maidstone.
,, 22	Richmond	Greyhound Hotel, Richmond.
,, 22	West London	Chiswick School of Art, Chiswick.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 7.—Mr. Alexander Mackie in the chair.

Mr. A. L. HENDERSON showed a small burnt-in enamel, produced by Mr. Spencer Cook, of Dunedin, New Zealand, who had succeeded simply with a few instructions by letter which Mr. Henderson had given him. Mr. Henderson considered the picture very promising, and observed that people said he did not give all the necessary information in the patent which he had taken out years ago. This was not the case.

ORTHOCHROMATIC PLATES AND HALATION.

Mr. W. P. DANDO had recently been using commercial isochromatic plates which gave halation, although backed with burnt sienna and caramel. He also observed that, in trying to reduce by means of methylated spirit and water, he found the films of the same plates dissolved away.

Mr. J. E. KELLOW also showed two negatives on isochromatic plates, both of which had been backed. One showed halation, the other did not.

Mr. F. W. PASK had used several of the same kind of plates, backed with sienna and caramel, without being troubled with halation.

CARAMEL BACKING.

Mr. DANDO asked the best method of backing plates for travelling? He found that caramel never absolutely dried.

Mr. A. HADDON suggested taking advantage of the tackiness of the caramel to cover it with paper.

Mr. A. E. DAWSON stated that caramel would dry in five minutes if properly made. As a rule, it was not boiled long enough. He had some made three months ago, which had not dried yet.

Mr. HADDON said that caramel, mixed with gelatine, produced an insoluble mixture, and subsequently stated that caramel should be made at a temperature of 220 Centigrade.

Mr. J. S. TEAPE, in reference to a complaint on the subject, said coating with a brush drawn in lines would leave portions of the caramel in ridges, to avoid which he recommended dabbing, or stippling the backing, on to the plate.

A PAPER DARK SLIDE.

Mr. HADDON observed that no doubt they had seen, in a penny photographic paper, an advertisement, running, "Why carry heavy wooden slides when twelve" (such as that which he exhibited) "could be made in an hour!" The specimen in question had cost him over a shilling; it consisted, apparently, of brown paper and cardboard, and Mr. Haddon said that he did not think any one would venture to expose plates in such a slide.

GELATINO-CHLORIDE IN 1885.

Mr. F. A. BRIDGE exhibited a photograph bearing date April, 1885, when Mr. Satchfield introduced his Acme gelatino-chloride paper. It was claimed that it printed in a third of the time of ordinary albumenised paper, but he (Mr. Bridge) found that it did not print so fast. The halves of the print were on Acme gelatino-chloride and ordinary albumenised paper respectively, and both were in good preservation.

INTENSIFICATION.

Mr. J. S. TEAPE, in the course of a short address on this subject, said that probably no member had done so little intensification as himself, as he always aimed to get density at the start. He had reason to believe that there was much less done now than in the past, and many things occurred to him which affected the matter in this direction. For one thing, they had exposure tables, actinographs, actinometers, &c., which enabled them to guard against excessive over-exposure, which, in the early gelatine days, was the cause of thin negatives. Slow and thickly coated plates for landscape work, which were in increased use, undoubtedly bore more exposure without giving a thin image than rapid plates. Backing, again, enabled a plate to stand more exposure without giving a thin image than an unbacked plate. The use of gelatino and collodio-chloride paper reduced the necessity for intensification, as they could obtain vigorous prints not otherwise got. Formerly the paper was prepared for the negative; but now such papers were ready for use. Captain Abney had said that, to get the greatest possible gradation in a negative, a thin image should be developed, and then intensified, and he (Mr. Teape) quite agreed with that. The range of tone was certainly greater in the negative developed right out in the first instance. The intensification of the half-tones to a greater extent than the high lights was a point of great value. A plate might be put into the solution, and the latter allowed to penetrate the half-tones only, the solution being prevented attacking the high lights, but it was a very difficult matter to reverse it—that is, to intensify the high lights more than the half-tones. He had tried Mr. Chapman Jones's method, but development went on so much that it could not be stopped, and he also found that a plate, intensified with uranium and washed for a quarter of an hour, had the density of the lights reduced, but the half-tones were untouched. It was difficult to say how that happened; but, as it touched upon the very point he had just mentioned, it was, perhaps, worth referring to. Possibly the dense parts of the image held the hypo more than the other parts of the film, and thus Farmer's reducer was formed, which might cause the reduction. Mr. Teape concluded by giving the following formulæ for intensifiers, which he had used himself:—

No. 1.

Potassium ferridcyanide	30 grains.
Uranium nitrate	30 ,,
Acetic acid	25 minims.
Water	10 ounces.

This might be used for a long time, and, when the action slowed, gave a red image. One of the advantages of the intensifier was that an excess of density could be removed by washing, or reduced, locally, by a dilute solution of carbonate of soda.

No. 2.—Monckhoven's Intensifier.

Solution 1.

Potassium bromide	10 grains.
Mercury bichloride	10 ,,
Water	1 ounce.

Solution 2.

Silver nitrate	10 grains.
Potassium cyanide	10 ,,
Water	10 ounces.

Solution No. 2 would give a precipitate, but a thirty-grain solution of cyanide should be added, drop by drop. Bleach and wash, and then apply the silver solution.

Mr. BRIDGE said that he never had occasion to intensify nowadays, and Mr. T. E. FRESHWATER made a similar remark.

Mr. TEAPE observed that, as very rapid plates only gave thin images, that supplied a special use for intensifying.

Mr. STEVENSON complained of pinholes with mercury, followed by ammonia.

Mr. C. H. COOK objected to mercury and ammonia, as the shadows were clogged up.

Mr. DANDO asked if it were not advisable to remove veil before intensification.

Mr. TEAPE said that was a very important point, and recommended bichromate of potash and sulphuric acid for the purpose.

Other members continued the discussion.

THE ZEISS ANASTIGMATS: SERIES II.

Mr. DANDO showed a Zeiss apochromatic Anastigmat (Series II.), which he said was the first one sent to this country. It had a focus of about six and three-quarter inches, and at *f*·6, the largest aperture, covered a whole-plate; at *f*·11 it covered a 10×8. The lens was intended for hand-camera work. The distance between the combinations was only three millimetres.

The meeting then closed.

North London Photographic Society.—July 5, 1892.—Mr. B. J. Grover in the chair.—Received with thanks, for library, Mr. E. Dunmore's *The Photographer's Companion*; Mr. J. Fallowfield's *Photographic Annual*. The Secretary reported that he had received a very kindly letter from Mr. J. Howson, of the Britannia Works Company, Ilford, who was to have addressed the meeting on *Isochromatic Photography*, stating that he had been called abroad, at a few hours' notice, on most urgent business, and would be unable to be present. The Company had, however, sent as a substitute a large parcel of their new isochromatic half-plates for distribution among the members, who, it was hoped, would test and report upon them. A vote of thanks was cordially passed to the Britannia Works Company for their liberal action in the matter. Notice of the change of programme had been sent to all members, and a general conversation on technical matters took place, principally on isochromatic plates. Mr. Brewer showed a successful negative of red roses taken on these plates, and the Secretary, who used hydroquinone (Ilford universal) as a developer, had found the isochromatic plates most useful. Other members preferred a pyro developer, but all who had tried agreed in the great advantage of the colour correction. The plates received were duly distributed as requested. Next meeting, July 19, *Holiday Outfits*.

North Middlesex Photographic Society.—July 11, Mr. C. C. Gill in the chair.—A technical evening was held. In the unavoidable absence of Mr. F. W. Cox, Mr. F. Cherry opened the discussion on *Development*. He dwelt chiefly upon the portraiture side of the question, gave his own method of working, and dealt with the allied subjects of lighting and exposure. Messrs. Beadle, Frost, Marchant, Smith, Taylor, Wall, Mattocks, Tittensor, and the Chairman took part in the discussion, which gradually tended in the direction of the prevention and cure of halation. The comparative difficulties and advantages connected with working celluloid films also attracted attention. Some of the members had found a difficulty in washing film negatives when a number had to be treated at once. Mr. Frost had solved the difficulty by bending the film into a cylindrical form, gelatine side inwards, and tying it round with a piece of thread. A number of them could then be put into a washing trough, and the water allowed to flow through them without fear of injury. They were then hung up to drain in the same state, and when dry the thread could be taken off. Three new members were elected. Prints were then shown on samples of the Eastman gelatino-chloride paper, which were distributed at the last meeting, the consensus of opinion being that the paper was good in all respects, and that widely different tones could be secured upon

it with certainty and ease. The usual competitions of views taken at field-days were held, the vote of merit being accorded to Mr. Marchant, for Broxbourne, and to Mr. Walker for South Mimms. The next meeting will be held on July 25, when Mr. F. Cherry will take the chair, and Mr. Thomas Bedding will addr as the Society. Visitors welcome.

Hackney Photographic Society.—July 5, Mr. Walter Barker in the chair.—The Chairman hoped the new quarters would be fully appreciated. A question from the box about whether carbonate of potash would frill more than ammonia was then discussed. Mr. Beckett had never had any frilling with either; possibly the temperature of the water was the cause. Mr. W. Fenton Jones said soft gelatine, used by some makers, was sometimes a cause. A question was then asked, "If two lenses of same focus were selected for use in stereoscopic work, would they be suitable, and would there be any difficulty of letting off shutters at same time?" Mr. Dando said there would be no mechanical difficulty, but the lenses ought to be good, and selected by an optician. Mr. Sodeau showed card on which 100, 200, and 300 parts of an inch were shown. Report of excursion was then taken, Mr. Gosling humorously describing it. Mr. Dean showed photograph of fungi eighteen and a half inches across; Mr. Barker, work done on Eastman gelatino-chloride paper, samples of which had been sent. Mr. Dando handed round a piece of the same paper which he had put in wrong way in frame, and asked, if he dissolved the gelatine from other side, would it fade? Mr. Beckett said, Not if paper had been properly fixed and washed. Mr. Gosling handed in prints on Ilford printing-out paper from negatives on Ilford isochromatic plates. Mr. Hudson showed an arrangement he had made—on the stereoscopic principle—for taking moving objects. The idea was, that focussing could be done on the top, and the exposure made immediately it was obtained sharply. Mr. Dando thought the top would rather draw out of focus. The Chairman showed a diaphragmatic shutter, the shutter opening from, and closing to, any sized diaphragm. It was said that the principle was wrong, as only fifty per cent. of exposure was obtained. Mr. Hensler had heard it stated that a smaller stop alters focus. The Chairman observed that Dallmeyer advocated focussing with any aperture *but* the full. Mr. Beckett said faulty lenses would alter in focus. The Chairman handed round a new hand camera of his own design. The plates dropped on to an indiarubber band, which one member declared was dangerous to the plates, as it would cause a formation of sulphur. Mr. Dando wanted to know whether storing backed plates would cause them to deteriorate, but an opinion was given that it did not. Mr. Dando was then unanimously chosen as a delegate to the Convention on behalf of the Society.

Leytonstone Camera Club.—The members of this Club had a most successful outing on July 2. The place of meeting was Kingston station. Some good shots were got in the town, it being market-day. The busy market was well patronised by carriers of hand cameras. The Coronation Stone and other historical spots having been visited, the party were ferried over the river, where points of vantage were secured for the bridge and town. The bridge was next crossed, and the party proceeded to the promenade, where some excellent snap-shots on the river were made. Proceeding along to Teddington, some good shutter exposures were made, the lock, going over the rollers, the weir, &c. The next outing is on July 16, to Cheshunt; meet Cheshunt station four o'clock. Visitors are heartily welcome.

Kensington and Bayswater Photographic Society.—July 11, Mr. F. A. Hahn in the chair.—Mr. G. W. Tottem, from Messrs. Houghton & Sons, gave a practical demonstration of their hand camera, the "Shuttle," and various other novelties. Mr. Winter, from Messrs. Mawson & Swan's, showed Loman's patent camera, a novel form of book camera, walking-stick tripod, &c.

Putney Photographic Society.—July 4, Rev. L. Macdona in the chair.—Messrs. Faulkner and Macdona gave a demonstration in development with rodinal and pyro-soda, showing how the results of a considerable over or under-exposure may be corrected by suitable modifications of the constituent parts of the developer. The demonstration was followed with much interest by the members present. Messrs. Faulkner and Zachariasen exhibited prints on the new Eastman chloride emulsion paper, which were greatly admired. Sample packets of the paper, presented by the Eastman Company, were distributed for trial amongst the members. Tylar's "Full-view" printing frame, an improved metal single dark slide, and other novelties were shown and discussed. Four new members were elected. The Society having joined the affiliation scheme of the Photographic Society of Great Britain, Messrs. Macdona, Vice-president, and Zachariasen, joint Hon. Secretary, were elected delegates to serve on the Central Committee of the affiliated societies. The summer outings, held on alternate Saturdays, to places in the neighbourhood, have been very successful; many good negatives have been taken, and will, no doubt, give additional interest to the competition amongst members for the Society's medals. The outings have been particularly instructive to the beginners who have been able to profit by the kind assistance given them by the more proficient. The next outing will be held on Saturday, July 23, at three p.m., at Hampton Court.

South London Photographic Society.—July 4, 1892, the President (Mr. F. W. Edwards) in the chair. Attendance 33.—Mr. J. F. Kelly read a paper, *Can our Excursions be made more Interesting and Useful?* After a brief description of a typical photographic excursion, the lecturer dealt with a large number of suggestions for rendering such meetings more attractive and useful. He considered that excursions should always be arranged to suit the pockets of the majority of the members, and suggested that, at the commencement of each excursion, a short demonstration by some competent member, nominated for the purpose, of the practical use of some part of our apparatus in the field, as the proper use of the rising front and the swing, the capabilities of lenses, exposure, and the uses of tables and meters, shutters, &c. He regarded excursions as a means of educating the younger and inexperienced members of the Society, while the more competent workers would use them as prospecting times for more serious work. The announcement at the preceding meeting of the places to be photographed, and the points of interest, &c., would be useful. The social side was dealt with. The lecturer urged that excursions should be arranged with some end in view, as, for instance, the illustration of the river Thames from Sheerness to Oxford, a complete series of social views, the monuments of London, &c. Results should be shown at the following Society meeting, and a free and impartial criticism indulged in, and advice and suggestions given. Mr. Kelly deprecated the practice of stowing away good negatives until the exhibition, for fear that some brother worker might infringe his copyright—the view was not made by the first man, that is common property, and the second might not be able to so arrange it as to make a picture, or might make a better; then, if so, he deserved the credit of it. A set of good lantern slides, illustrating the excursion, should be made yearly, to become the property of the club, and loaned to members after they have been exhibited at a meeting to be held for the purpose. This meeting might be so arranged as to form a general entertainment by the members, and be productive of general good feelings. Mr. Kelly's remarks were criticised to great length by the members present.

Lewes Photographic Society.—July 5.—A small exhibition of hand cameras was held. Some of the members described the cameras they had in use, and Mr. E. J. Bedford gave a description of several of the latest patterns, which had kindly been lent by Mr. Hardcastle, of Brighton. The certificate for the last quarterly competition, for "the best photograph of animal life," was awarded to Mr. J. Tunks. Mr. Foxall (Brighton) judged the prints sent in, which were not so numerous as might be desired. The Society will make an excursion to Alfriston on Saturday, if the weather is favourable. Others have been arranged for Buxted, Newick, and Isfield. The subject for next quarterly competition is "Landscape, with or without figures." Mr. J. L. Adam was elected a member of the Society.

Sheffield Photographic Society.—July 5.—Mr. B. J. Taylor in the chair. After the election of two new members, Mr. C. W. Crowder gave a paper on *A Holiday Tour on the Norfolk Broads.* He began by describing the journey to Yarmouth, and from thence to various resorts on the Broads; also the best and most convenient means to get there. The Secretary laid upon the table samples of the new Eastman printing paper, and intimated that the excursion to Allport next Wednesday gives promise of a large number taking part in it.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

HELIOCHROMY.

To the EDITOR.

SIR,—I cannot find any excuse for Dr. Vogel's persistent misrepresentation of facts. He may have such a bad memory that he forgets important occurrences after a few years, and he may not understand the English language well enough to have learned that the heliochromoscope is not a projecting lantern; but I doubt it. I had positive assurance that Dr. Vogel received and replied to the statement, which he now says he never received. Any one who will look may see that he did not "acknowledge" the heliochromoscope on page 318, as he has twice positively asserted that he did. I believe that every statement made in my last letter was strictly true. I know that Dr. Vogel's alleged principle cannot be carried out in accordance with the Young-Helmholtz theory of colour vision. I do not know that Dr. Vogel has ever produced any good results by any photo-chromic process. My position is clearly defined in the paper recently reprinted in your JOURNAL, page 357. I believe that the repeated misrepresentations which my references have proved are quite sufficient to justify me in declining to have any further controversy with Dr. Vogel.—I am, yours, &c.,

F. E. IVES.

London, July 8, 1892.

SPEED OF PLATES.

To the EDITOR.

SIR,—Allow me to thank Mr. Watkins for his considerate reply to my letter of the 10th ult. There seems to be but little difference in our views needing comment, at any rate, except as to the method suggested of using Spurge's sensitometer and a standard tint-plate. This instrument gives a series of exposures, increasing in geometrical progression, the amount doubling at every third hole. Thus, counting from the smallest hole, the holes 1, 4, 7, 10, &c., constantly double the exposure. It is required to compare the speed of two plates by means of this instrument.

The plates are exposed behind the sensitometer to the same illumination developed for (say) twenty minutes, fixed and dried. On comparison with a standard tint, one plate, A, is found to possess that tint with exposure No. 7, the second with exposure No. 10. It is inferred that, as exposure No. 10 is double of No. 7, the first plate is twice as rapid as the second. We are here judging from an examination of one tint only of each plate, and that is what I called "restricted observation."

If we examine *all* the tints, and find that tint 8 of plate A agrees with tint 11 of B; 9 of A with 12 of B, and so on throughout, then undoubtedly the first plate is twice as rapid as the second; but it is just here that I apprehend that the method would fail, it is generally the case that other tints, say, 9 and 13, would agree, and had *that* tint been adopted as the standard (and it is arbitrary) a different speed would have resulted.

If, instead of confining our observations to one tint, we note the behaviour of the tints among themselves, we get a much more definite result; Messrs. Hurter & Driffield would say: "If in plate A the densities

increase with approximately equal increments from and beginning with No. 7, and those of plate B from No. 10, then, no matter how the densities of one plate compare with those of the other, A is twice as fast as B." The first few exposures never increase in density in this regular manner, nor do excessive exposures, but there is always a range that does increase thus regularly; find the first term of this regular series, and the problem is solved.

There now arises the question, *how much* light has fallen through hole No. 7 or hole No. 10. If this can be answered, we need not refer one plate to another as a standard, but express the rapidity in terms of the light itself. Failing a better unit, the authors of the method use the standard candle at a metre distance, and say that the *inertia* of a plate, *i.e.*, the amount of illumination needful to bring the plate to the commencement of the regular series of densities, is so many candle-metre seconds.

The next step is, I think, not generally known. It is, however, important as answering, *in a great degree*, the objection that the speed has been determined by artificial, not natural, light. Just as Mr. Watkins, by actual camera trial, finds the plate number on his meter for a given plate to be 51, so by actual trial Messrs. Hurter & Driffield find the actinograph number to be 34 *when the inertia is* 1 *C. M. S.* Therefore, for any plate, they divide 34 by the inertia to obtain the actinograph speed. The assumption is that, if one plate is twice as rapid as another to candle-light, so it is to daylight. It is a natural assumption, and is justified by the success of the actinograph to indicate the correct exposure on the strength of this assumption.

As Mr. Watkins states that he is engaged with the investigation of this subject, and that for this reason he defers giving his views in a complete form, it would be unreasonable to expect a detailed argument from him. The subject, however, being of wide interest, it may not be out of place for me to bring before your readers the complicated nature of the problem, and the remarkable researches which have been brought to bear on its solution.—I am, yours, &c., R. C. Phillips.

The Arts Club, Manchester, July 4, 1892.

P.S. I have before me the records of two plates, both highly developed. An exposure of 0·625 C.M.S. on one gives the same density as 1·3 on the other; 2·5 on the one gives the same as 5·6 on the other; and 21 C. M. S. gives the same density in both cases. What could be concluded from these *data* as to the relative speed of the plates? The speeds are actually as 54 : 20.

CLEAN NEGATIVES.

To the Editor.

Sir,—I find the best and simplest way of removing the green or iridescent stain on the negative is by gently rubbing the surface with a tuft of cotton-wool moistened with spirit, or it can be done directly after fixing by rubbing with the finger; but, of course, it requires more care than with the spirit when the negative is dry. I see a correspondent complains about the new platinotype paper. I enclose a piece, mottled; the cause was being left by accident in contact in the printing frame with a negative which was very dense, being over-intensified with mercury.—I am yours, &c., T. W. Kirby.

22, *Grove-park, Liverpool, July* 11, 1892.

ORTHOCHROMATIC PHOTOGRAPHY.

To the Editor.

Sir,—We will only trouble you with a very short reply to the letters of Messrs. Allison Bros. and Mr. Acworth, which appeared in last week's Journal. The letter of Messrs. Allison Bros. fully corroborates our statement as to the disclaiming clause which, by order of the Comptroller, was inserted in Dr. Vogel's specification (No. 15,532, 1886) in consequence of our opposition. As to the legal effect of the disclaimer, Messrs. Allison, as patent agents, have a perfect right to their opinion; on the other side, we have the opinion of the most eminent patent law counsel that the effect would be as we have stated, "that the Vogel process could only be worked in this country under the Tailfer patent." We have, therefore, good reason for considering our opposition as successful.

Our description of Dr. Vogel's system of "optical sensitising" by means of dyes was taken from his own English specification, No. 7963, dated June 15, 1886. In this specification, although many dyes are mentioned, not a word is said about eosine, the superior properties of which as a colour sensitiser for gelatino-bromide of silver would appear only to have been recognised by the Professor at a later date, the specification of his so-called "eoside of silver" process being dated November 29 of the same year. As to this latter process, we deny entirely Dr. Vogel's right to claim it; we maintain that it is simply a copy of the Tailfer process; in fact, only a more roundabout way of producing by the same means, *i.e.*, eosine and ammonia, precisely the same colour sensitive compound of eosinated bromide of silver which is obtained more directly by Tailfer's method.

We have additional evidence to this effect in Dr. Acworth's own letter of last week, in which he says that in our isochromatic plates, which are made by the Tailfer process, "the dye is present, combined with silver as recommended in Professor Vogel's patent." Precisely so, the result is exactly the same, except that plates prepared as recommended in Dr. Vogel's patent will not keep, as Dr. Acworth has already admitted in his paper read before the Photographic Society.

We do not intend to discuss the validity of Tailfer's patent. If further evidence is required on that point, it will be found in the disclaimer published at the end of Dr. Vogel's specification. We are perfectly satisfied ourselves, and with our licensees, the Britannia Works Company, Ilford, are fully prepared to maintain our rights by all legal means.

With M. Vidal's spiteful letters to Dr. Acworth we have nothing whatever to do. It only concerns M. Tailfer, who will doubtless know how to deal with its author and publisher.—I am, yours, &c.,

Hackney, July 12, 1892. B. J. Edwards & Co.

CORRECT EXPOSURE.

To the Editor.

Sir,—It is difficult to believe that Messrs. E. Collier Green and John Sterry fancy that the focal length of a lens is not one of the factors regulating the intensity of the illumination of the plate during exposure, yet that is what their letters in your issue of July 8 seem to imply.

Mr. Green says: "Now, in the case of two lenses, one double the focal length of the other, and both having the same relative stop, the number of rays of light from any unit of surface of the landscape which pass through the stops will, in the case of the longer-focus lens, be four times greater than in the case of the shorter-focus one, *for the area of the stop is as four to one.*"

According to Mr. Green, therefore, with two lenses, one of eight-inch focus and one of four-inch focus, used with an identical stop of one inch in diameter, the effect on the plate will be the same in both cases, for, to use his words, only altered so as to apply to this case, the number of rays of light from any unit of surface of the landscape which pass through the stop will, in the case of both lenses, be the same, for the area of the stop is the same. As a matter of fact, however, the ratio of intensity of the two lenses used under these conditions is as one to four; in other words, the plate is four times as brilliantly lighted by the four-inch focus lens as when the eight-inch focus lens is used.

Mr. John Sterry, too, seems to think that the distance of the plate from the stop which regulates the amount of light is a negligeable factor, for he says: "Surely it is evident that when the plate is placed at half the original distance (which fact I had by no means forgotten), where the *same* amount of light covers the *same* area of plate, the illumination must be equal."

If by that he means the same amount of light at the point where the plate is, the statement is correct; but this is not what he said in his letter in your issue of June 24. The important words of his then were: "The stop has been reduced to a quarter of the area, and allows exactly the same amount of light to pass as before."

If, therefore, his statement is meant to imply that where the same amount of light admitted by the stop illuminates the same area of plate the illumination must be equal, it is by no means true; for, as is pointed out above, the distance of the plate from the stop is as important a factor in regulating the intensity of illumination as the size of the stop itself.—I am, yours, &c., M. J. Michael.

July 12, 1892.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Will exchange Dallmeyer's 2 B for 3 D or Ross Universal.—A. Jennings, 85, St. Alban's View, Blackburn

Exchange, wanted good posing chair, two or three backs, and table, exchange 48-key English concertina by Wheatstone.—Address, Treegow, photographer, Whittlesea.

Will exchange splendid French rapid rectilinear lens, whole plate, ten-inch focus, for wide-angle rectilinear or outside show cases.—Address, Wilkinson, Church-green, Harpenden, Herts.

Samuel's patent hand camera with two finders, rapid rectilinear lens, holds twelve quarters, in exchange for 10×8 view lens or 9×7 rapid rectilinear.—Address, J. Dunn, 1 Laygate-place, South Shields.

Exchange quarter-plate instantograph set (brass bound) with three double brass bound slide lens shutter, tripod and sling case for good half-plate set with cash.—W. Anderson, Polvellon, Yelverton, South Devon, R.S.O.

Will exchange No. 4 junior Kodak little used, or 12×10 modern tourist camera, three double slides and tripod, or 12×10 rapid rectilinear, and 12×10 wide-angle rectilinear, for a 10×8 Ross universal symmetrical lens.—Address, E. W. Mellor, Fairlawn, Lytham.

Exchange Coiffier's full-plate lens; *Photography*, Vol. III. complete; The British Journal of Photography, 1890-91; *Photography*, Vol. LXXXIII. to XCI.; for good second-hand half-plate camera, double slides, latest improvements by a good maker.—Address, A. Clarke, Art Studio, Bethesda.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

Goodwin Thorley, Long Eaton.—*Photograph of Sir Walter Foster, M.P., head and shoulders. Also one showing head, shoulders, and the arms crossed in front.*

E. MATTHEWS.—No.

MIA.—Received; in our next.

FAIR PLAY.—Better communicate with the Company on the subject.

FIDES.—We do not think you would be justified in doubting the integrity of the person referred to.

T. C.—Common German moulding is not worth renovating. New frames will be by far the cheapest.

C. BUNYARD.—The plan you propose appears suitable, seeing that the length of the room is not available.

E. LIESEGANG (Düsseldorf.)—The *Idler* is published by Messrs. Chatto & Windus, Piccadilly, London, W.

ETHEL CONSTANCE MAY.—The phrase you refer to was inserted by inadvertence. Thanks for calling our attention to the matter.

BULLOCK BROTHERS (Macclesfield).—Messrs. Waterlow, the London Stereoscopic Company, and other firms undertake most, if not all, photo-mechanical processes.

JAS. NOWELL.—For particulars of the forthcoming exhibition of the Photographic Society of Great Britain address the Assistaut Secretary, 50, Great Russell-street, W.C.

LITTLE and MCCLEAN.—The picture is probably a collotype, such work, of which it is an example, being, we believe, undertaken by the London Stereoscopic Company and other firms.

A. M. W. asks us for a design for a good detective camera that is free from patents. Several have been described in back volumes, but most of them have since formed, wholly or in part, the subject of patents.

F. SHORT says: "I have a Daguerreotype for copying, and unfortunately it has been scratched badly. Is there any means of getting rid of the scratches?"—We know of no means of removing the scratches.

T. MCALPINE.—See article in the present number. In that you will find your difficulty dealt with, and from it you will be able to see the cause of your trouble better than we can point it out from the limited details contained in your letter.

R. S. A.—Build the studio as shown in the plan, as eighteen feet would be too short for general work if built the other way. As, from the description, we imagine no light will be obtained from the west side, the studio had better be constructed on the "lean-to" principle.

CLARINA HILL.—If space is available, erect the studio so that it runs from north to south. Twenty feet will be very short for anything but bust or three-quarter figures. As regards the cost, you had better get a builder in your neighbourhood to give an estimate for the work.

OTHELLO.—We are not aware of any such contrivance. Probably the best arrangement for you would be a double camera, with the foci of the lenses equal. This would enable you to observe the image on the ground glass of the upper camera without the necessity of taking out the slide.

W. J. BEDWELL says that in the formula given for matt varnish there are no directions for use, and asks if it is to be used like ordinary varnish—the plate warmed and the varnish flowed over—or should it be applied to the negative cold?—The varnish should be used without heating the plate.

J. M. P. says he has a portrait lens three and a quarter inches in diameter, and ten inch focus, and a rapid rectilinear of about half that diameter, and twelve inches focus, and wants to know which lens would be the better for copying some pictures twelve inches long, on 10×8 plates?—The latter lens will be the better to use.

ALF. C. WARD.—The "dull, or ground-glass appearance" of negatives and transparencies developed with the ferrous oxalate developer is due to the lime in the washing water, which causes a precipitate of oxalate of lime on the film. Very dilute hydrochloric acid will dissolve it, and make the picture transparent again.

REV. C. A. asks if there is a copyright still existiug in the old Bartolozzi prints—those printed in a red or sepia ink?—The copyright in Bartolozzi's original works has expired. Many of the prints have been reproduced, and it is possible that there may be a copyright in some of the reproductions, though in the original prints there is none.

G. H.—1. With care, the prints need not be creased or torn in drawing them over a flat piece of wood to prevent them from curling. Commercial prints, that are put into the market unmounted, are usually rolled, under heavy pressure, on a burnished steel plate. They then keep flat, and have a high gloss, which they retain. 2. Try the flash light; it is inexpensive.

OXFORD.—We believe you are legally in the wrong in exhibiting the picture, but, outside the question of legal rights, we should advise you, as the lady objects to its exhibition, and simply, as an act of policy, to defer to her wishes. She may be of "little moment" in your town, but it is not wise to provoke a conflict which can do ou no ood, if even it does not do you harm.

P. O. Q.—If the youth is not being taught the trade, and is merely employed at menial work, our advice is, Consult your solicitor. He will, no doubt, find the indentures are valid, advise you to commence an action for the return of the premium you have paid, together with damages for loss of time, and something for services rendered. Your complaint is not altogether an unusual one.

ELECTOR.—The prints are over-toned. Although they may have been taken out of the bath while they were quite brown, they are still over-toned. They are mealy, which would not have been the case had they been removed at an earlier stage. Some papers, particularly when the negatives are not very vigorous, will not stand toning beyond the red stage without becoming mealy, although they will yield good prints of that tone.

C. BENNETT (Lymington).—From the appearance of the negative, we should judge that the water contains some impurity, such as iron, particles of which are impressed in the soft film by the sponge. Each of the spots has a distinct nucleus. Under the circumstances, you had better abandon the use of the sponge. We fear the spots are irremovable, but you might try the effect of reducing the negative down to a very thin image, and then intensifying it.

C. HOOD asks how he can take stereoscopic views of street scenes—instantaneous pictures—with a single camera. The thing is easy if the camera is large enough to take a half-plate. Then all that is necessary is to fit a partition in the centre of the camera, so as to divide it into two parts, and screw a pair of stereoscopic lenses on the front. If the camera is not large enough for this, the thing is impossible, so far as instantaneous views of moving objects are concerned.

H. S. says: "Enclosed is a sample of a quantity of prints I have had brought to me to take off mounts and remount in album. After they were unmounted, and as they dried, they came up like the print enclosed. Could you kindly inform me what will restore them to their original state?"—The print sent is a collotype that has been varnished with an aqueous solution of lac. Clean off the "chilled" varnish with methylated spirit, and then re-varnish with an aqueous solution of white lac in borax. That will restore the prints to their original state.

OPALINE says: "I have mounted some photographs on bevelled glasses as opalines and am about to fasten the backs or stands on. Is it safe to use ordinary glue for that purpose directly on back of photographs? If not perhaps you can kindly suggest the best method. If you can tell me a good means of spotting such prints so that the colour will not come off in wetting I shall be glad.—1. In place of glue we should recommend you to employ gelatine—the best kind to use is Nelson's soup gelatine. 2. Ordinary artist's oil colours with rectified spirit of turpentine.

REDNEB.—Burton's book on *Photographic Printing Processes* (Marion & Co.) will give you a general idea of the different mechanical processes, and from that you will be able to form an estimate of the cost of plant, according to the scale you wish to commence upon. The plant of some of the most successful commercial workers cost many thousands of pounds. With suitable machinery and appliances, we see no reason why you should not compete successfully with large firms, if you do the same or better work. Portraiture is not so profitable now as it was years ago.

PHOTOGRAPHIC CLUB.—July 20, *Photo-mechanical Processes.* 27, Report of the Delegates to the Convention. 16, Outing to Watford.

WE note that Mr. F. A. Bridge is announced to give a lecture on "Quaint and Humorous Songs" at the Birkbeck Institute on Wednesday next.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—July 21, Adjourned Discussion—*Intensification.* 28, Delegates' Report of the Edinburgh Convention.

SINGAPORE PHOTOGRAPHIC EXHIBITION.—The Exhibition of the Singapore Amateur Photographic Society opened on June 3 last. Some of the pictures are admirable specimens of art, and will bear comparison with the results of professional photographers. Looking first at the competition pictures, the prize for the best set of landscapes was taken by Mr. H. M. Simons. The second best set of landscapes were sent in by the Hon. Secretary, Mr. E. J. Robertson, an avenue of the Botanical Gardens at Buitenzorg being the pick of the three. A group of the students at the Malay College was reproduced in the *Daily Graphic*, and the two prints are exhibited in juxtaposition. The best work of the whole exhibition is to be found on Mr. D. C. Neave's stands. Two beautiful prints of lilies and a transparency are of the highest merit, artistic in design and technically almost perfect. A splendid interior is also shown by Mr. Neave, who also has a small table showing details of a photo-mechanical process for the production of plates for newspapers and illustrations. The original, the negatives, the zinc positive, etched plate, and final picture of this complicated process are to be seen. On an adjacent table, Mr. Heim shows some good stereoscopic slides. Mr. W. Thomson shows a series of good pictures, some of his interiors being most successful. "G." has some good prints of the native troops at Blakang Mati and the "R.E." of Saigon. The list of things worth looking at is by no means exhausted. There is some weak, slipshod work, but the wonder is not that such should appear, but that a Society of so small dimensions numerically should be able to show so much as the results of a year's work. The members are heartily to be congratulated.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1681. Vol. XXXIX.—JULY 22, 1892.

DO NEGATIVES LOSE DENSITY IN FIXING?

It may be remembered that some months ago an esteemed correspondent, Mr. Albert Levy, of Paris, favoured us with a communication, in which he implied that the density of a developed gelatine negative suffered reduction in the hypo fixing bath. Applied in this connexion, the term "reduction of density" would, in its ordinary acceptation, be held to have a purely comparative meaning, since it must be obvious that, in gauging the density of an unfixed negative by the artificial illumination of the dark room, the influence of a substratum of unaltered salt in the plate converts the point into one of individual judgment, which, as the resulting negative too often shows, is as liable to be fallacious as not. There is no respect, indeed, in which both beginner and proficient are so likely to trip as in deciding when the negative has reached proper printing density, to which circumstance we are inclined to trace a not infrequent necessity for an intensification or strengthening of the image, which is often ascribed to other causes.

The burden of our correspondent's contention, however, was, not that there was an apparent reduction due to an optical deception, but that in reality the actual density of the developed image underwent diminution in the fixing bath, and we therefore endeavoured to demolish the theory that any reduction took place, supporting our argument by such evidence to the contrary as instantly appeals to the mind when the feasibility of the phenomenon is briefly considered. Our conclusion was that the loss in question might be due either to under-development or under-exposure, or both in combination, the apparent density of the image being influenced to a great extent by the colour or consistency of the original film.

We observe that the subject of this assumed loss of density came under discussion at a recent meeting at one of the London photographic societies, and, from what was said on the occasion in question, we are induced to suppose that there is a more or less general belief that a real reduction of developed density does take place in the fixing bath.

On practical as well as theoretical grounds we have no hesitation in meeting the proposition in a spirit of scepticism. We say now, as we said before, that in imputing this reducing property to the fixing bath the latter is assumed to have the power, at a normal strength and for a normal time, of dissolving out the metallic silver of a developed gelatine negative to a material extent. Such a conclusion has, to our knowledge, never been practically demonstrated or maintained.

But why is this reduction of density assumed to be confined to the negative? If it takes place in that case, are not lantern slides and transparencies equally liable to loss? What, too, of developed gelatino-bromide prints, of printed-out emulsion papers? If density of deposit—not mere apparent density, mind, which is another thing, and not, of course, what is meant—is reduced in negatives by the fixing bath, it is equally at the mercy of hypo in the other cases we have cited; but, so far, we are without any data to warrant the assumption that it has ever been noticed or experienced.

Confining ourselves to the question of negatives, however, the conclusion forced upon us from a consideration of the point is, that whatever reduction takes place is apparent and not real. On the previous occasion we drew attention to the circumstance that the presence of iodide in the film renders it more opaque, so that it is easy to conceive how, in development, a backing of bromo-iodide of silver, being presumably of a deeper colour than pure bromide, would conduce to an appearance of greater density of the image than where the sensitive compound was confined to the latter salt alone. We have hinted advisedly that silver bromo-iodide is only presumably yellow, as compared with pure bromide alone; for it is, we believe, known to experimentalists and others that the latter salt occasionally assumes, in an emulsion, a yellowish tinge, which renders it indistinguishable, even to the experienced eye, from silver iodide.

Other causes, in addition to the foregoing, may lead the incautious to generalise too hastily over this supposed evanishment of developed density. Among these we select inconstancy or irregularity of dark-room illumination. If the light be comparatively weak, either from the employment of a small flame or too dark a tint of non-actinic material, the density of a negative is liable to be over-estimated, especially if the operator is usually, or even occasionally, accustomed to work by a less subdued light. Over-exposure is an obvious trap in mistaking density, especially in a weak light, and, coming from the general to the particular, different makes and rapidities of plates vary so greatly, both in colour as well as thickness of coating, that, even where one is working by an invariable illuminant, the imagination is easily seduced into an erroneous comparative estimation of density. This leads us here briefly to lay stress on the value of uniformity of dark-room illumination on the score indicated, as well as on that of others.

A discoloured developer is by no means a negligeable factor in the creation of false impressions as to density, and another thing which facilitates, although, of course, only slightly, the optical deception is the fact that the film is wet. In point of fact, a wet negative appears denser than a dry one. But the main cause of the illusion is, of course, the colourific property of the unaltered salt. On the last occasion when we treated of this interesting point, we remember fixing the half of a negative (leaving the other half unfixed) that had been taken on a slow plate, which we knew contained a compara-

tively large quantity of iodide. Upon examining the plate by ruby light, the difference in apparent density was enormous, and the same disparity was maintained against a naked gas flame.

But the example we cite was one of apparent reduction only, and under that head, we are convinced, come all those cases where loss of density is complained of. No such loss, we submit, actually takes place—unless, perchance, we have all along existed in dark ignorance as to the action of alkaline developers on the exposed silver haloids in gelatine, and have deprived dilute hypo of a right to be considered, with nitric acid, a solvent of metallic silver.

PLATINUM AND PLATINUM RESIDUES.

New developments of probably the most stable of all photographic printing processes naturally lead to the dissemination of an increased amount of interest as to the available sources of supply of metallic platinum, and, in response to a suggestion recently made to us with that object, we here indicate the region from which, notwithstanding the frequent reports alleging the discovery of platinum in Australia and other parts of the globe, the supply of the metal for the various uses to which it is now placed is principally derived.

The platinum beds of the Ural Mountains, according to a foreign contemporary, are the only ones in the world in which the metal is found in grains. Platinum is found in Brazil and in the Cordilleras in the hard serpentine rocks, but never in the form of grains. The platinum beds of the Ural Mountains are found in various districts. The platinum found in these places is in the form of grains, in sand frequently containing gold. The weight of the grains is from 17 to 21 grammes to every 1640 kilogrammes of sand. The richness of the platinum beds varies in the same proportions. In some, the thickness of the turf covering the sand does not exceed from 2·16 metres to 2·88 metres; while in others it varies from 10·80 metres to 14 metres, so that it becomes necessary to work underground. The thickness of the platinum sands does not vary much. A noticeable characteristic of it is that they are found in the form of friable grit, and easily washable. The clayey sand is rarely met with.

The demand for platinum for industrial purposes is relatively restricted, as it only dates from the last twelve or fifteen years. It is, of course, as our readers are aware, largely used for electric lighting and dynamo conductors, and considerable quantities of it are employed for photographic and chemical purposes generally. During the last twelve years the annual production of platinum has averaged about 3194 kilogrammes, of which half has been derived from the beds in the north of the Ural Mountains, belonging either to the State or to private persons.

Throughout the whole world only about 3270 kilogrammes of platinum are annually used; but it is anticipated that this amount will soon be considerably increased, and it is stated that the platinum beds of Bisserski can alone supply the total quantity required for the consumption of the world. When the demand for platinum was insignificant and the price very low, the gold miners who found platinum while seeking gold frequently, it is stated, used the former, instead of lead, as shot for firing at wild birds.

Although the consumption of platinum in photography is small compared with the extent to which it is used in other arts and industries, its characteristic fluctuations in price give it something more than a sentimental interest to photographers, who on at least one occasion have had cause to deplore its temporary scarcity by an increased price of the salt employed in the production of the platinum image.

Where a large quantity of platinum paper is used, it is apparent that great importance is to be attached to the recovery of the metallic platinum contained in the unaltered salt, associated with the sensitive iron compound, which is applied to both the old commercial hot and modern cold-bath platinum printing surfaces. Indeed, it will be evident that spent oxalate developing solutions must carry down with them a considerable quantity of platinum, and hence its recovery should not by any means be neglected.

In our present number a correspondent from a distant part of the globe who, it appears, has been accustomed to work platinotype printing on rather a large scale, asks us to give a method for recovering the platinum from old developing solutions. The process is simple enough, and in describing it here we have little doubt that it will do a service to others.

The vessel containing the accumulations of the old developers is heated until the liquid reaches a temperature of about 180° Fahr., a saturated solution of ferrous sulphate in the proportion of one part to four of the oxalate solution being then added to it. Precipitation of a dark substance immediately takes place; this is finely divided metallic platinum. When the precipitate has settled, the supernatant liquid is drawn off, and the precipitate after being washed is ready, either for conversion into chloro-platinite or for transmission to the refiner. Probably the latter is the preferable plan.

Of the quantity of platinum salt with which platinotype paper is coated it has been estimated that far from all of it is taken to form the image, so that the wisdom of saving the developing solutions is manifest. The acid clearing solutions, however, only carry over but an infinitesimal proportion of the platinum salt, so that their preservation for the purposes of recovery would be futile.

Chlorophyll.—In view of the use of this substance in correct colour photography, it is interesting to note that the long-held idea that iron is a constant constituent is now stated to be incorrect, Dr. H. Molisch, who has recently been investigating the question, having found that iron was invariably absent in the ash of chlorophyll.

Photographic Patents.—A General Election is usually said to upset men and things. Has this been the case with photographic inventors, we wonder? In the list of over 350 applications for patents in the official journal last week there was not one that directly or indirectly related to photography. This is a most unusual circumstance, as of late years the applications for patents in connexion with the art have been very plentiful indeed, although a considerable proportion of them are not completed.

Photographs in Natural Colours.—In connexion with this subject, we have recently been visited by a gentleman who only the other day was in M. Lippmann's studio, and he informed us that that investigator is still pursuing his work in the same direction. Professor Lippmann some months since gave to him one of the spectrum photographs which created such excitement in the scientific world, but it is far exceeded in interest, he told us, by some of the later pictures, one taken of a combination of the French and the Russian national flags being strikingly real, and exhibiting the colours of the original in a very complete manner.

Cracked Negatives.—It is no unusual circumstance to find, after a negative is developed, that the glass is slightly cracked at the corner. If it be printed from in this condition, the chances are that the crack will extend, sometimes to the total destruction of the negative. If the attempt be made to cut off the damaged portion with a diamond, the pressure will often cause a split right across the picture. The best and safest way to deal with the fracture is to lead the crack out of the negative with a hot rod. If a piece of stout iron wire be heated and then the point placed on the glass a little in advance of the crack, the latter will follow the wire in any direction. By this means the fracture may be led to the edge of the plate, and thus further extension will be avoided.

International Copyright.—The recent law passed by the American Congress appears to be of very little protection to English publishers, as their works are still freely pirated in the States. A firm has, it appears, recently republished some of Messrs. Novello & Co.'s music. The latter have now commenced a test action against the pirates, and the whole of the home music publishing trade have combined together to bear the costs of the suit. This is as it should be. So far as pictures are concerned, the law is practically a dead letter, as we are told that directly European works are published in America they are systematically pirated. Notably is this the case with photographic reproductions of European works of art, particularly photogravures. In this direction the Continental publishers, we learn, suffer more than those in England.

The Next President of the Convention.—As will be seen from our report of the proceedings of the meeting of the Council of the Photographic Convention of the United Kingdom, which took place in Edinburgh on Saturday morning last, Mr. George Mason, of Glasgow, was unanimously selected to occupy the presidential chair at the meeting of the Convention which is to be held at Plymouth in 1893. We have little hesitation in prophesying that the conjunction of Mr. Mason as President with the same vigorous executive that has piloted the Edinburgh meeting through to such a remarkable success will result in an enhanced degree of prestige and good fortune for the Convention. The choice of the new President is a happy one, his extended knowledge of photography in all its phases, his high literary qualifications, and the universal esteem in which he is held by all sections of photographers admirably qualifying him for the honourable position he has been selected to occupy.

Holiday Work.—The holiday season is now on, and amateur photographers are rushing away with their cameras in search of the picturesque. It is a noteworthy fact that many amateurs will take a journey of perhaps hundreds of miles, and then expend the larger proportion of their plates on subjects such as could be obtained quite as well close at home, perhaps on a Saturday afternoon outing. This is rather surprising, as one would have surmised that the opportunity would be taken, in visiting a district, to take only such subjects as could not be obtained elsewhere. For example, in visiting, say Scotland or Wales, it would be well to secure, in all the pictures taken, something to identify them with those particular places. If this were done, most amateurs' collections would prove far more interesting from variety than they are. One country lane is pretty much like any other country lane, and pretty ones are to be seen everywhere. However, the amateur finds pleasure in whatever he does, and is not like the professional, who has the question of ways and means to consider.

Technical Schools.—A great deal has been, and is being said on the advantage of technical schools, such as those on the Continent. There can be no question as to the benefit to be derived from such institutions, but do they, in practice, prove of such value as some writers would have us believe? Let us take photography and its different branches as an illustration. From inquiries we have from time to time made amongst Continental workers, we have been given to understand that the knowledge gained at these schools, though thoroughly theoretical, is not of a really practical character. One gentleman, the head of a large photo-mechanical printing establishment, recently told us that pupils from these schools rarely knew anything practical of the different processes taught. Indeed, he said he would rather take those who were quite ignorant of the subject, and teach them himself, as they always made better workmen in the end than those trained in technical schools, as they had nothing to unlearn, which the others often had. We have heard similar opinions expressed by others on the Continent. However, one would think this should not be the case if the tuition were of the proper character, and this it is said to be in the Continental schools.

Coloured Pictures by Photographic Aid.—At a recent meeting of the Berlin Physical Society, Professor Vogel exhibited what is described as a remarkably fine series of coloured prints of oil paintings, &c., prepared in accordance with his method by Messrs. Vogel and Ulrich. His plan consists in first taking a red, a yellow, and a blue negative of the object, on plates specially sensitised for colours. The three negatives are then printed on one and the same piece of paper by means of complementarily coloured rollers or stones. In order to obtain the colours exactly complementary to those of the negatives, the colours used for printing were either the coloured sensitisers themselves, or some substance whose equivalence to these had been determined spectroscopically. The application of the physical principles involved in the above yielded an approximate reproduction of the natural colours, which is stated to be "surprisingly complete, and will become more so as more and more coloured substances are discovered suitable as sensitisers."

Lunar Photographs.—Dr. L. Weinek, of the Prague Observatory, has received several photographs of the moon from Professor Holden for the purpose of making enlargements from them, the negatives having been taken at the Mount Hamilton Observatory with their large equatorial. In *L'Astronomie* for June is an illustration of one of these enlargements. We have not in our possession a copy of that periodical, but *Nature* points out that it looks at first sight as if the amplification had been carried too far, though at arm's length the effect is very fine. "The most striking features are the narrow, river-like lines, which are numerous and very alike in appearance. Whether these are photographic or not of course we cannot say, as we have not seen the original negatives, but they seem to be rather too distinct and natural to be taken for any impression other than photographic." Thus the editor of *Nature*: to us the description reads exactly like that of the effect which would be produced from "crapey" collodion, an effect well known to all old workers in collodion. Whether our explanation be correct or not, it would appear to us that enlargements of this character would stand a far better chance of being well done if the work were put in the hands of a professional photographer accustomed to that class of work.

Copyright.—In the report of a recent meeting of one of the Metropolitan Societies things appear to have got a little mixed, and might convey to some the idea that there may be a copyright in a view—that is, if a particular view has been photographed by some one, and that person has made his picture copyright, that the same view cannot afterwards be taken by any one else. This, no doubt, was not really the idea of the speaker, though the report might give the opposite impression. We should not have referred to the subject, except for the fact that we frequently receive letters inquiring if, when a photograph of a landscape or of a building is marked copyright, any one is prohibited from taking the same subject from a somewhat similar standpoint. Evidently such an impression exists, at least in the minds of some people, or we should not have so many queries on the subject. There is no copyright in nature. If a person takes a photograph, or paints a picture of any particular view, he can make his photograph or painting, as the case may be, copyright, but that will not prevent any one else from producing another photograph or painting from exactly the same spot, and in every way the same both as regards size and style. It would, however, be legal piracy to

copy the picture that had been copyrighted. Nature cannot be copyrighted though a picture from it may be.

A Rapid Albumen Process.—In the article on the albumen process, a few weeks ago, reference was made to the fact that, by a modification of it, one of the most rapid pictures yet taken was produced, namely, when the late Mr. Fox Talbot, over forty years ago, photographed some printed matter fixed to a rapidly revolving wheel by the light from the discharge of a Leyden battery. Some correspondents have asked for a description of the modification that conferred such extreme sensitiveness. Here is a brief outline of the method as given by Talbot in 1851 :—A glass plate was first coated with a thin film of albumen, and dried. It was then treated with a very dilute solution of nitrate of silver containing a large proportion of alcohol, and again dried. Then it was washed, and once more coated with the albumen. After that was dry, the film was iodised by dipping the plate into a solution of proto-iodide of iron containing a considerable quantity of acetic acid and alcohol which had been made some time, so that acetic ether was developed. The sensitising was effected by immersing the plate in a strong solution of nitrate of silver strongly acidified with acetic acid. The plate was then exposed in the camera while wet. The image was developed with a strong solution of proto-sulphate of iron. It will be seen that this film contained nitrate of iron, and to this, no doubt, was due the extreme sensitiveness, nitrate of iron being a strong reducing agent.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

EDINBURGH MEETING.

At the Wednesday afternoon meeting, Mr. H. P. Robinson's paper was read by Mr. T. C. Hepworth—

INDIVIDUALITY IN PHOTOGRAPHY.

By H. P. Robinson.

In a recent number of *Blackwood's Magazine* an ingenious writer tries to show that the one thing more than another that now represents primitive man is the baby, and that the nineteenth century British baby differs very little from the savage child of, let us say, a couple of hundred thousand years ago, for the baby is nearly a quadruped, and is a reckless creature devoid of conscience. It is, perhaps, a knowledge of the fact that babies are all alike that enables photographers, as it is libellously said, to make the negative of one of the species satisfy the yearnings of many mothers. Now, photography is certainly somewhat like this view of the human race in the respect that its immature productions are all alike, and it is not until they grow up and acquire a conscience or soul that they differentiate and show individuality.

Of the immature there is no end, but a wise and invariable provision of nature checks over-production. Nature is always wise, but has no mercy :

> "So careful of the type she seems,
> So careless of the single life ;"

and, seeing that the world would be overwhelmed by immature photographs, she sent beneficent fading to destroy them (always, as in other departments of nature, "so careful of the type," sparing a few) until the art grew old enough to possess a soul or conscience, and then permanent methods were given to us; and even now we sometimes feel inclined to paraphrase the wisdom of Mr. Whistler, and say modern photographs do not fade, and therein lies their deep damnation. This wonderful preservation of a few in all their pristine freshness is suggestive of a special providence, for according to the scientists, who are, of course, always right, like methods should produce like results, and not one of the old prints should have escaped.

Now, evidence of soul or conscience in a picture is art. Yet there are those who will not recognise that we have a soul, but, like Mr. Gilbert's mechanical figures in the *Mountebanks*, are only stuffed full of badly made machinery that sometimes runs down, and always moves with a jerk; and I am not sure we are not suspected of trying to adapt the "put a penny in the slot" business to the fine arts.

It is a favourite reproach with the opponents of photography as a picture maker that its results are all alike; it is one of the triumphant proofs of those who will not admit that photography is an art that the unthinking machine makes all its products to the same pattern; that there is no intrinsic evidence in any photograph of its maker. They will no more believe the plainest evidence to the contrary than those of old would believe the angels. They say we are mechanical, and it is of no use pointing out that this wild assertion is obviously untrue, we hear it over and over again, sometimes from one who knows that it is not true, at others from those who are simply ignorant and cannot learn. These are to be pitied. Then, there are those whose purpose it serves to deny; and, worst of all, those who have tried, and altered their faith because they failed. those who, as the poet says, "fade away, and dying damn." To the credit of photographers there have been very few of these; however, we have lately had an exhibition of one of them. A most enthusiastic defender of photography as an art of a few years ago, but who, perhaps, failed to prove it in his works, was politely asked to contribute to a recent exhibition, and is reported to have replied as follows—it is a lesson on the mutability of things to compare this letter with his former opinions: "I am fully persuaded that photography is not art nor can be, and to encourage exhibitions is to lead a lot of vain people to waste their time in the practice of a useless and vain pursuit."

It has no effect with the prejudiced critic to point out, that if different minds using the same machines produced like results invariably, as machines are expected to do, any one of them who understood the machine ought to be able to turn out a series of masterpieces equal to the best that have ever been produced, always providing, of course, that one machine was as good, and as well brassbound and French-polished as the other. Yet they continue to say—and this is one of the latest utterances of science : "The picture painted by the artist is a transcript of his own emotions, but a photograph is not a reflex of human emotions at all—unless, indeed, accidentally so—but is a direct reproduction of nature, and only through science the offspring of man." We must be grateful to the writer for allowing us the accident.

I am quite ready to confess that up to a certain point, and in the hands of the ninety per cent. of the followers of the art who are not artists, the photograph is in the process; but with the others the picture is in the man (as in painting, only in a less degree, and as far as the materials will allow). The process takes a very subordinate place, and is dominated by the taste, thought, and feeling of the artist, when an artist uses it with what may be fairly called emotional results. Who has not laughed with many of Rejlander's characteristic heads, or wept—yes, I have seen even that emotional result produced by a photograph (which was not an accident), and it is an important part of my argument that all these emotions arose first in the mind of the photographer, and would never have been originated by the same models in the hands of another photographer.

Of all the attempts made to prove that photography was not an art, that which would have most force, if proved, would be that it showed no evidence of individuality; but, on the other hand, if the possession of that quality were proved, it would be one of the strongest arguments in favour of the admission of photography to the brotherhood of art, for individuality, in its products, necessarily implies the operation of a directing mind behind the "soulless camera."

The latest of the many attempts to define the meaning of the word "art" is a very remarkable one. It is said to be, "The apparent disproportion between the means employed and the end obtained." And, as an illustration, the following explanation is given, at which, I think, many a practical photographer will smile.

"Admit, for argument's sake, that a photograph reproduces with a fidelity far beyond anything that the hand of man can attain to, it must still be allowed that the means used to attain this end are infinitely more complicated than the few hairs tied to a stick which the artist uses. Indeed, it might be argued that, if *art* is the apparent disproportion between means and end, photography is not art at all, but science. There is no art on the part of the lens when it produces its images ; it does so strictly in accordance with natural laws. The developer acts as thoughtlessly as any other chemical experiment, and these are the chief factors in every photograph. It is true, you have one small part to play—you must have the *art* of exposing properly; but even here a few shillings will purchase for you a machine to do even this. I do not admit art in development. Art in development is only called in when the exposure has been made without art, and, as I have already allowed art in exposure, I cannot allow it here again. With such an infinitesimal part of the picture' the outcome of art, is it honest to call a photograph a work of art?' This curious example of scientific knowledge of art is by Dr. J. K. Tulloch, of Dundee, and was written in the present century. Are we to understand from this singular piece of reasoning that painting is an art because the painter uses "a few hairs tied to a stick?" and does the writer suppose that we claim photography as an art because of its fidelity—that heritage of the youngest amateur?

Some writers get confused between degree and kind. In an article in the *Magazine of Art*, a certain writer, who was once a photographer, endeavours to show that photography cannot become art, because its individuality is limited. That it is more limited than painting has always been admitted—we cannot get so far away from the truth as is the painter's privilege—but it is also admitted that all methods of art are more or less limited, and the amount of limitation is only a matter of degree, not of kind. The limitations add to the difficulty, but do not alter the status.

Let us run back a little and see if we can find a few workers whose results are totally different from those of their contemporaries, and this invariably. One of the earliest photographers to show genuine art feeling in his work was Rejlander. He died sixteen or seventeen years ago; yet, among many thousands of photographs, it does not require much experience to recognise a Rejlander. There was nothing in the manipulation to distinguish them, except, perhaps, carelessness. It was the mind of the man that was visible, you recognise the man beyond the process. There are still those living who can say, on looking at a collection of old photographs, This is a Francis Bedford, a Dr. Diamond, a Fenton, a Delamotte, a Le Gray or Silvy, a Wingfield or a Mrs. Cameron, certainly quite as accurately as an expert in painting would say this is a Raphael, or Titian, or a Correggio. Then, what becomes of the machine argument?

I will now endeavour to put it another way. Photographs, as I have endeavoured to prove, show the mind of the producer—when he has a mind to show—and given two equally gifted photographers, as far as equality can be measured, the one could not produce even a colourable imitation of the work of the other. Neither could dismiss his individuality let him try how he may. Take two representative men, Rejlander and F. Bedford, neither of these accomplished photographers could have imitated the other. They had both original minds, and followed the bent of their genius, and their hands, as well as brains, showed in every picture.

Among the workers of the present day, I could point to dozens of well-known instances, but one or two must suffice. No man's work has been more imitated than that of Mr. Gale. In every exhibition, he is imitated in size, style, framing, and signature, yet an expert can decisively say of two pictures, This is the Gale, and this the imitation; he can even distinguish between the imitators, and say, This is a ——, and this a ——.

Then, in a very different style, there are the works of our much-respected President, than whom there is no one I would prefer to see occupy the honourable position which defective health compelled me to decline. Perhaps I am not a fit and proper judge of his pictures, but, without altering my opinion of what a photograph should be, I must confess that some of them have captured my admiration for their beauty and respect for other ways than my own when in good hands. Now, some have endeavoured to imitate Mr. Davison, and some have renounced photography in despair, because they could only reach the eccentricity without touching the excellence. It is easy to put the image out of focus, but not so easy to make a picture by that means, and Mr. Davison makes pictures. It is easy to copy peculiarities, but not so easy to Imitate valuable essentials.

While on the subject of our President, may I be permitted to add—for he is now in a public position and open to our shots—that, however straitened his views of the practice of photography as an art may have been at one time, his opinions have constitutionally broadened down, until now the key-note of his teaching is liberty for all

We now come to another proof of individuality. It used to be the practice to insist on anonymity at exhibitions until after the judges had done their work: but this was given up when it became apparent that the judges usually recognised the work of the old hands, and the only nameless ones were new exhibitors. In America—at least, at the Convention Exhibition—the farce of the anonymous is still carried to such an extent that nobody seems to know, officially or otherwise, who the pictures are by until it is too late to be of any use to the exhibitors; and newspaper criticism has to be published without names. For, however the photographs may proclaim their authors, it seems to be etiquette to pretend not to know.

The difference between the works of some of our best photographers and those of the moderately successful can scarcely be due to a scientific cause, except, indeed, to a reversal of the generally received idea; for I think, if the truth were known, it would be found that the producers of the indifferent pictures had much more scientific knowledge than those who produce the most artistic pictures. I am acquainted with a great many of our photographers, but I do not know one of those to whom we are accustomed to look for the chief ornaments of our exhibitions who have any elaborate scientific knowledge. Indeed, their technical methods are so very simple as to seem quite elementary. They usually take a plate to the make of which they are accustomed, a simple pyro and ammonia developer, a handful of hypo, and a jug of water, and use them properly; and that is all. They do not bring science to bear even on the exposure, at the expense of "a few shillings." They get on without an actinometer. They feel from experience when their plate has had enough, and an actinometer, however perfect, would only confuse them. But, as they endeavour to put taste, thought, and feeling into their pictures, their works necessarily differ from those of the scientist, and the essence of their art is individuality.

My last word must be a word of caution. Be original, be unique if you can, but not out of harmony. Individuality goes wrong when it is out of harmony with its surroundings. Eccentricity is very easy, but it does not last. It is open to the meanest capacity, and is often assumed by it; but genius, to be useful, should consist of individuality, backed up by suitability to its environments.

Mr. Crooke said there was no doubt there was individuality in photography, and pointed to instances in which it was expressed. He thought that in many portraits of large size an advantage frequently arose from their not being in quite sharp focus. In small pictures sharpness was looked for as it was in a miniature. He was much pleased with Mr. Robinson's paper.

Miss Barnes had recently been out photographing with Mr. Robinson, and he said to her, "Now you have got some good exposures, see that you don't spoil them in developing."

Dr. Mitchell considered that no proper photographer could be an artist without possessing individuality.

Mr. Bothamley quite agreed with the paper. There were many photographs, as well as many paintings, in which there was no individuality; but they must judge photography by the work of the best men, for it was capable of producing artistic results.

The President said that it was not likely there would be much difference of opinion among photographers as to this, but many painters were greatly prejudiced. One of these had said in his hearing that, if six painters were given a definite subject to paint, the result would be six pictures each differing in character from the other; but set six photographers to work to reproduce it, and all six photographs would be alike. This he (the Chairman) denied. He advocated treatment of subjects broadly, which often did not harmonise with sharp focussing. He was much pleased with the paper, which bristled with good points.

The following paper was read by Mr. Bothamley in the absence of the author:—

PHOTOGRAPHY IN RELATION TO PAINTING.

By Arthur Burchett.

In commencing this paper on *Photography in Relation to Painting*, I feel that I cannot do better than give the definition of both painting and photography. Painting is a representation of objects on a flat surface, painted by the hand by means of brush, pencil, or other tool being under the will of the artist, unrestricted in fancy, subject, colour, form, place, or period. Photography is a representation of objects on a flat surface, restricted to the absolute reality of form present, as rendered by the lens on the sensitive plate in the camera, being only under the control of the photographer in development and in *choice* of subject, form, place, focus, and length of exposure, and in some few cases light and shade.

Such being the definitions of painting and photography, we can now see how very limited are our resources in photography, compared with painting, for producing a picture that shall have qualities that give it an art value, for it is not a mere transcript of nature that we require, but a picture containing some sentiment or idea that shall give pleasure to those who see it, and in nature there is in both figure and landscape an endless wealth of beauty that we can render, if we see nature with the knowledge of what the camera will do and what it will not do.

Photography being limited to reproducing the objects present without colour (which in painting is often its chief charm), we must therefore, find out how near photography approaches painting by comparing reproductions of paintings with the work of the lens. Unfortunately, photography is severely handicapped by the inability of the sensitive plate to render the true tone value of all colours, and this inability adds very much to the difficulty we have in judging Nature as she is represented in the photograph and in painting; but even with this defect the result in photography is very close to the true rendering of Nature, and will be even more so in time as photography advances. I need not point out the defects of photography with regard to

rendering colour into black and white, for we all know them. In painting, certain colours have a different tone value to some artists than to others, and, when their pictures are rendered into black and white, fail to recognise the likeness of effect to that of the painting.

Both in photography and painting we have to consider, in the construction of the picture, the possibilities of its being a success, its story, composition, light and shade, and all the various items that make its being. A painting or photograph must have some reason for existing, some object or story, and this must be the one thing that all else is to be subservient to. In a picture the artist tries all he can do to keep your attention fixed on his principal figure or object, and to do this keeps all his what we call "focus" on it, and all else is kept down both in tone and sharpness, so that the eye shall not wander away and become confused by the surroundings. Many pictures and photographs are spoilt by the want of concentration of interest, simply by forgetting this simple rule, in painting by over-elaboration of unimportant objects, brilliant colour or strength which kills the principal object in the picture; in photography, by microscopic focus, which puts everything on an equality with the principal object, accentuating things that are unseen by the eye, for the eye sees the thing that is, not what it is made of; a tree is made of many leaves, branches, &c., but the eye sees them as a mass of foliage, not as individual items.

Many pictures are spoilt by want of contrast of light and shade, for it is a well-known rule in art (and art applies to photography as much as painting) that, except in exceptional circumstances, there shall be no accessory object lighter than the principal object of the picture, or, if that is a dark, darker than this object. In this was the secret of the great success of the old Flemish artists, Rubens, Vandyke, Rembrandt, &c. Both photographers and artists cannot do better than carefully study the way in which these masters have managed the light and shade, both in portraiture, figure, and landscape.

The next thing to consider is the composition or arrangement of the figures or objects that constitute the picture or photograph. In painting, this is comparatively easy, as the artist can place his figures where he pleases, and use any kind of composition. But the photographer is entirely limited to a more or less equal plane of focus, owing to to the distortion the lens gives in figure subjects, for what is simple foreshortening in painting often becomes absolute distortion in photography.

Composition not only applies to the arrangement of the figures, but also to the light and shade, which must be so managed that it gives value to the lines of the figures, and in figure and landscape pictures so combine them that they become as a whole. With pure landscape photography, composition is impossible, as you cannot arrange your objects; you can only select a view, and can only use the knowledge of composition to help you to choose the best view. In landscape and figure pictures very much can be done in photography, but you are limited to simple arrangement in a selected landscape, which has to be taken just as it is, and which, in painting, would be so altered and arranged that it would carry the lines of the composition in harmony with the figures.

Light and shade in landscape, which are so important in painting, are quite as important in photography; but here, again, we cannot arrange like the artist, but are quite dependent upon the effect at the time of exposure, which can sometimes be chosen. It is a very great misfortune that photography will not render the true effect of cloud and sky, combined with landscape, for, until this is possible, we must depend upon the sky from another negative, which, more often than not, is entirely unsuited to the landscape, and also is, as a rule, printed far too heavy.

In painting, besides the great charm of colour, the artist has one which is, perhaps, greater, that is, "ideality," or the rendering of the image of the mind as opposed to the reality. Idealism in painting often merges into mannerism. There are many living instances of this, the weary repetitions of the same form and the same effect. In photography, the danger of mannerism is greater, as, if we use the same stop to the same lens, and the same printing method, our photographs must necessarily look more or less alike, only the difference of form. I suppose it will always be so, at least, with the majority of workers who only have one lens. Painting is very much like handwriting; one can recognise the author, but photography changes in character with every different kind of lens, so that it ought to be possible to escape from the more glaring faults of mannerism.

Impressionism must not be confounded with idealism, for impressionism is the rendering of the way the object or scene appeals to you —how you see it—whereas idealism is the correcting or altering nature to suit what you consider true beauty. Impressionism in photography is not only possible to a very large extent; but the results are very beautiful, and *do* depend in a very large measure on the artistic aptitude of the photographer, and the knowledge of his lens, and though, to those who are unable to see the beauties of nature (and they are legion), it may appear entirely chance work, yet those who use knowledge both of nature and photography, know that the results are precisely those that were aimed at.

And now we come to what is considered to be the great strength of photography, its imitation of form. In painting it is often colour that expresses form, such as grass, sand, and many other things. There the colour tells what it is, and the mind is satisfied; but in photography, unless there is a *sufficient* indication of form, the representation is vague, and leaves the mind wondering and unsatisfied; it is therefore necessary to the proper understanding of a scene or object that the definition of form shall be such that the objects are recognisable, but how far it should be carried is entirely a matter of individual feeling, for, as in the case of idealism, the perception of form is in the mind; to one person form is soft and without line, to another the feeling of form is so strong that he can only express himself by sharp outlines, it is only a matter of thought, for in nature there are no outlines. The impression of nature is to me a soft blending of colour and tones, quite unlike the rendering given by what is termed "a nice sharp photograph." One of the great difficulties both painters and photographers have is the introduction of figures into landscape so that they shall not intrude or attract the eye from the *motif* of the picture. As a rule, we find in the best landscape pictures that, if a figure is introduced, it is placed in the middle distance, and is used more to serve as a known size to give grandeur to the landscape. Turner was a master at this, and, though he defied this method in some of his pictures by placing the figures in the immediate foreground, yet he did it so well that they appear away from where the spectator stands, and therefore practically in what is the middle distance. Of late years it has become more the fashion to introduce figures in the foreground, so as to give a title to the picture, but it is very difficult to do so without sacrificing the landscape to the figures. Of course, these remarks do not apply in the case of what are called "*figure* and landscape subjects," for there the figure is the important object and the landscape only accessory.

I am afraid that my paper will not be considered complete unless I make a few remarks on motion as rendered by the camera and by the artist. I know that it is dangerous ground to tread upon, but I must needs venture. In the expression of movement in painting, the artist does not endeavour, like the photographer, to obtain a perfectly still look or an action that he cannot see, but such an action that shall express the characteristics of the movement he wishes to represent, whether it be running, leaping, falling, &c., and obtains that look of movement not only by the position of the figure, but also by means of flying drapery. Now, in pictures by many of the great masters, this drapery is painted in indistinct folds *purposely* to give the effect of movement. There is a very fine instance in the National Gallery, London, *St. George and the Dragon* (by Tintoretto), perhaps the finest example of movement ever painted. To say that movement must be expressed by movement expresses what I wish you to understand. In this picture not only do the figures seem to be moving, but the drapery vibrates; but still it has not the same kind of look that photography gives of the blurr of movement, but is of a character that I am afraid photography can never imitate. Another instance of the rendering of movement is Vandyke's drawings of the condemned being cast into hell. The mass of humanity seems to fall headlong. The effect of movement is indescribably true. When an artist looks at an instantaneous photograph of the movement of a figure, the chances are that he has never even dreamt of that representation being what it is intended to represent. The very fact of its being a *perfectly* arrested action takes away all sense of movement, and makes it only a pose. In landscape the expression of movement cannot be expressed by a perfectly sharp image. How often one hears the remark, 'This is not good, as the trees have moved.' Yet to an artist it is often the best quality that photograph possesses. Turner, the great master of movement, always got the effect of wind in his trees, waves, and sky by indistinctness of detail.

Sea and sky in photography are often perfectly representatives of movement. One need only see one of Dresser's seascapes to acknowledge this; but there are many other photographers who only give the arrested motion, the stillness of death, for it has the form but not the breath of life.

The imitation of nature should he in photography what artists have endeavoured in all ages to paint—that is, the life of nature not as a still, sharp microscopic image (for the time is past when we were content with seeing nature under this false light), but as a representation of life as seen by the eye, for what is false to the eye cannot

appeal to the mind. It may be a perfect photograph as far as exposure, development, and printing can make it, but, unless it has that something which truly represents the life of nature, it is worthless in an artistic sense.

Mr. Hepworth considered the most remarkable thing in this paper was an absence of the abuse which painters so lavishly hurled at photographers. It was doubtless accounted for by the fact of the author being a photographer as well as an artist.

Dr. Mitchell said the perception of movement was not satisfactorily effected by a too rapid exposure, which gave a crystallised expression that afforded no idea of motion; that was better conveyed by a longer exposure which gave a slightly blurred effect. He instanced Muybridge's running horses as examples of this. The eye saw only the combination of movements.

Mr. Sturmey reminded them that while the author belaboured painters, he also admitted that some of them made poses that were natural and artistic.

Mr. Cembrano, alluding to clouds in landscape, said many of those seen in nature were quite unsuitable from form and lighting to conduce to pictorial effect when photographing the landscape, and considered it much better to print in the sky from another and more appropriate negative.

Miss Barnes remarked that her teacher in painting, long before she took to photography, impressed upon her the necessity for noting the points of brightest light and deepest black in the subject, and avoiding allowing any other part of the picture to equal these.

Mr. John Fergus having made some observations,

The President explained that Mr. Burchett at one time lost his colour-sight, on which account he practised photography; but he was glad to say that his colour-sight had again returned to him.

AMATEUR PHOTOGRAPHY IN AMERICA.

By Catharine Weed Barnes.

It will be impossible to enter fully into the question of amateur photographic work in America, and I shall not attempt it, but, in considering a subject which necessarily involves comparisons between English and American work and workers, it is well, in all fairness, to have some clear idea, to start with, of how photography is pursued, and the opinion entertained of it in both countries. At present, and this is said advisedly, the English have the advantage at exhibitions of a higher general average of work, though I do not know if it is the case as with us, that many good pictures never reach the exhibition hall.

The amateurs in England, and in Europe generally, seem to believe in what they are doing, and consider it worth while to give the work proper time and care, working hard if need be to ensure good results; and this is half the battle. There are too many what might be called snap results with us, and the camera is still looked upon largely as a means to kill time, not worthy of respect for its own sake. We are too anxious to do things quickly, missing often thereby what only comes from patient, long-continued effort. There are instances among our workers of almost infinite patience and determination to show what photography can achieve in art, science, and general education, and such are filled with an enthusiasm which enables its possessor to think only of the end in view, and bend everything to accomplish it, regardless of mental or physical fatigue. The old painters were ignorant of many of our modern canons of art, but they had a worship for the thing itself, too often wanting in our utilitarian age, and the same may be said of photography. Altogether, too many workers begin and end with "detective" cameras. Why? Because there is a delusion abroad in the land that they are no trouble, require no brain exertion, are always available, and the user need not look upon his instrument as anything more than a toy. He generally expects, however, that same toy to possess all the photographic virtues of the widely differing branches of work. Beginning with clean, well-lighted portraiture, for instance, through the gradations of soft, atmospheric landscapes and marines, brilliant snap-shots and carefully managed interiors, it is expected all these may be made in the fraction of a second, and, of course, with a single view lens and cheap camera. I once received a letter, not at all an unusual one in my editorial correspondence, wherein the writer took several pages to explain what he wanted a lens to do, each requirement contradicting some other, and asked me to recommend a cheap one. My answer was that no such lens as he desired had yet been invented. The American worker, especially in small towns, is very often unable to purchase more than one lens, and yet is anxious to cover the whole photographic field. In such cases I always discourage hand cameras, as, under the best of circumstances, their results cannot fairly compete with tripod work, not merely because the latter is better in itself, but after taking the necessary trouble of setting up such a camera, one is apt to take more pains with the picture. Until one realises all the possibilities of time exposures, he does not begin to appreciate photography at its true value. A very encouraging sign of progress with us is the increasing number of organizations devoted to camera work. Hardly a week passes that a new one is not started; and their reports, as sent to our sanctum, show a constantly widening horizon of comprehension regarding the different fields of photographic usefulness being entered upon by workers in different professions. Physicians, painters, scientists of all kinds are utilising the vast help photography can give them, and are realising also, aside from that, the great and almost mysterious fascination it can exert, independently, on its own special account. A celebrated painter told me recently that he occasionally used an ordinary snap camera, not daring to attempt any of the actual work, or he should neglect his regular painting. I cannot but feel that to do camera work well, through all its countless ramifications—and what is worth doing at all is worth doing well—one must get rid of, and put behind him once for all, the idea that its limitations are as narrow as the illiberal prejudices of the past have settled upon. It is far harder to live down a prejudice than a principle, and that is just the task that lies before photography.

Experience, however limited, has taught me that, when a certain effect is gained in photographic work which at all departs from an ordinary photograph, if one attempts to help others by telling how it was done, his effort is looked upon as if he took his auditors behind the scenes at a theatre, and showed them how certain theatrical effects are produced. Probably the same thing is true this side of the Atlantic. A camerist should, above all things, never apologise for anything which will improve his results, because negative or print has been, as the unregenerate term it, "doctored." If a painter refuses to recognise the existence of an obnoxious element which would spoil his picture and simply leaves it out, why cannot the photographer use the only means at his command, and obliterate the object, whether on negative or print? Why should one be considered genius and the other a trick? The American public, as yet, has not been able to realise that photography has risen far beyond the high tide-mark of a generation ago, indeed that it is still rising. They are, as a rule, more anxious for something new than for steady progress in the work; but attendance at recent exhibitions has proved to me that photography is winning a high place for itself, if its followers will insist on not lowering its flag to the level of a trade, but keep it where it belongs, among the arts and sciences which are elevating the general education of the world.

One great cause for the success of European workers at our exhibitions is that we do not give enough consideration to the choice of a subject. We have not the wealth of historic scenes which the old world furnishes, and landscapes, *per se*, pall on one's attention in large numbers; but we are doing something, I am proud to say, to preserve a record of the historic landmarks we own, before the so-called march of improvement destroys them, to say nothing of also keeping a record of passing events, which afford an important field for camera workers. One of the societies with which I am connected has an historical section, whose members are detailed, when any specially important event occurs, to photograph it from different standpoints, thus obtaining a large and varied collection of prints in a comparatively brief time. About a thousand negatives were thus obtained at the centennial celebration of Washington's inauguration as President, which will eventually be of great value. This society's badge entitles the holder to entrance within the police lines at fires, parades, &c., and to work in the city parks. Both the large New York societies also give their members special privileges. This idea as to historical work is spreading among our societies with excellent results. The Chicago workers ought to take up seriously the matter of photographing at the Exposition, and a general protest is likely to be made against what appears to be the somewhat arbitrary ruling of the authorities. Permission should not be indiscriminately given, but under restrictions.

I have not been able to procure statistics as to the number of clubs in our country, but have visited many of the leading ones from New York to California, finding that, as in the case of the Boston Club, with its fine studio and meeting-room, each has some special advantage, but none offer better working facilities than the New York and Philadelphia Societies. The New York Camera Club talks of a special club-house, with separate studios, dark rooms, &c. A desire is spreading among the clubs for more practical instruction than is given in papers or discussions, and nowhere is this better shown than

in some of the smaller clubs. The idea, so general here, of camera trips during the summer is also gaining in favour with us. Women are admitted to membership in the greater number of our clubs, and in some of those who still hold out in the good old way their work is hung at exhibitions, their lantern slides shown on the screen, and I have spoken before several clubs which do not as yet admit women members, agreeing, perhaps, with a gentleman friend of mine in one such club, that a photographic society should be considered merely as a sort of masculine boudoir. Women workers are increasing rapidly among us, and it is only a question of time when they will be generally recognised as mentally fitted to improve the educational opportunities afforded by a club. Working by one's self encourages a narrow, prejudiced manner of judging one's methods and results, and women as well as men need to have their rough edges taken off by the sharp attrition of sharp criticism and discussion. We have in America what we call smoking concerts, which women, even if active members, do not attend, and it is only occasionally that a pipe or cigar is seen in the ordinary meetings, never at general entertainments. In the dark rooms the stall system is largely used as being more private, but the printing and slide work is done in a large room. Quite a number of our leading workers have their own developing rooms, and even portrait studios. In my own case, after making a portrait exposure and developing the negative, I take it to a professional friend of mine, who retouches when necessary, and then, unless in special instances, the sitter orders from and pays him for what prints are desired, the negative, of course, being held by me. I have not time to make so many prints, and sitters would not realise the extra labour involved, besides valuing the pictures more if obliged to pay something for them.

In landscape work the English have an advantage, rather than disadvantage, in their unduly blamed climate, far better atmospheric effects being gained in our clearer air; but they, as a rule, use heavier cameras than Americans. We rarely use an imported one a great while before beginning to make improvements in it, and, first of all, making it lighter, carrying the latter point even to excess. English cameras, unless of specially seasoned wood, are apt to warp in our drier climate, and I do not believe in, and certainly never saw, a single American worker using a wooden slide in his plate-holder.

Most of our finest cameras are made to have the ground-glass keep its position, even when the holder is slipped into place, and the tripod if made distinct from the camera, which latter I am not sure is an advantage.

Practical demonstrations and clear plain talks seem to be most enjoyed at our Society meetings, and when papers are read it is a rare case when the lecturer is not afterwards called upon by different hearers to explain various points still farther.

Dry plates are most generally used, though a few cling persistently to the wet process. One amateur I know of who coats all his lantern plates, and another, in preparing his, takes into careful consideration the special purpose for which they are to be used.

Only a few of our manufacturers make slide plates, and I consider it as somewhat unwise to make them more rapid than the English ones, which actual demonstration has proved to me is the case. It is claimed that slide-making is losing in interest, but such entertainments are always well attended, though the audiences seem to pay more attention to the subject of the slide than to its technical or artistic merit. We trust that European workers will in time see the advantages of our size negatives and slide plates, and that there is no actual need of using such very heavy cover glass. International exchange of slides is an idea worthy of cultivation, and is of value specially in encouraging all to do their best. Several of our amateurs have experimented in camera-making, and of shutter attachments there is no end. Our national fondness for haste has found a new vent in a kind of craze for instantaneous (I use the word under correction) pictures of racing, athletics, scientific experiments, &c.; but, on the other hand, that same tendency leads us to constantly invent practical, labour-saving appliances, wherein I claim we hold high rank, and many of our best workers have either personally made many such, or suggested them to some manufacturer, while one amateur has invented a shutter which allows several exposures per second. Orthochromatic work (or, I should rather say, colour-sensitive) is receiving more attention than formerly as the plates improve. They were supposed to be very difficult to develop, but at some of our recent exhibitions remarkable results from them have been shown, especially as regards flowers and delicately tinted drapery. As is well known, Mr. Ives is the only one among us who has succeeded in demonstrating what is hoped for from colour photography, but even yet he has a difficult task before him. Ordinarily, we depend for our finest lenses on foreign makers, but there has been a new one placed recently on our market by a New York amateur which, in the way of reducing harsh contrasts and allowing the shadows and half-tones to appear as in the gradations of nature, practically enters the field of orthochromatic work. It has a violet colour attachment, which can be screwed into the place of the rear combination of the maker's rapid rectilinear, wide-angle, or portrait lenses. It slightly increases the time of exposure, and the eye is at first disturbed by the use of the coloured instead of colourless lenses, but the results are remarkable, especially with portraits. The makers are also busy with a tele-photo lens, similar in some ways to Dallmeyer's and Miethe's.

There is a reluctance with us, in England, except among those amateurs who have been given over as incurable, to carry a size camera which will permit the picture to properly represent the view photographed. Even when intended for use in the lantern, the picture-takers too often prefer contact slides, simply, it would seem, because their physical strength is really or apparently inadequate to the carrying an 8×10 or 5×7 camera for the negatives, to say nothing of the extra exertion of reduction, but; as the French proverb says, "that which costs nothing is worth nothing." With regard to developers, many of us like hydroquinone, more still like it mixed with eikonogen, and others eikonogen alone, though I believe the majority, for regular work, prefer pyro and soda, as ammonia does not seem to agree with our plates. It would seem a good plan to test each new developer as it appears, for then, and only then, can the worker be really justified in making a choice. A number of our workers are expert chemists, and always prepare their own developers, not pinning their faith on ten per cent. or any other made solutions. As one of our writers has said, "A fool or a folly is no better for being an old fool or an old folly," and, if any method of work or modification of it suits our purpose, we do not wait until it is overgrown by the moss of tradition before recording our acceptance. Film rolls are much used in hand cameras, though magazines are preferred by those who keep to glass plates, and their number is increasing. Albumen and other glossy surface prints have been most generally used, though they are being superseded with our amateurs by the various matt-surface papers, especially bromide and platinum.

The question of exhibitions is not yet considered, as it should be, a valuable factor in photographic education, and we do not have enough of them. I cannot but wonder sometimes that judges are found willing to face the almost certain blame attaching to them, no matter how conscientious they may be. They are fallible—very much so—like most of us, and naturally praise what seems good to them, whether the general verdict agrees with theirs or not. The true benefit of an exhibition is gained when one ascertains not merely wherein his work excels, but wherein it is deficient. The general impression is growing that boards of judges should not be formed exclusively of either photographers or artists, as each is apt to be influenced by the prejudices of his own special education.

When will it be understood, both sides of the Atlantic, that photography in its dual nature of art and science is not necessarily a house divided against itself, and why is it not possible, as in the story of the gold and silver shield, to look at the question from both sides? Americans have not shown their full strength at European exhibitions, largely because notices of such rarely reach us in time for us to prepare and send any special work, and some international arrangement ought to be made, certainly on our side, to obviate the annoying delay in the Custom House. But I do not propose to discuss the tariff question.

Photographic literature should not be entirely passed over, and its importance is shown not alone in journals especially devoted to its interests, but by the way in which it is leavening our whole American literature. The daily press in many cases publish a photographic column, constant references are made to the subject, and many of our magazines give considerable space to articles on the work, or illustrate their pages from the results of the camera. Even the way in which the newspaper reporter attempts to be humorous on the subject shows a general interest in it. We have several magazines devoted to photography, professional and amateur, and they have a wide circulation. Our readers demand a great deal, being very particular also how it is presented, and those who undertake to furnish food for the average photographic brain have by no means an easy task.

It is often asked me if photography is not dying out, but I can most positively declare that with us it is most constantly growing. There are almost daily inquiries, of every one who is supposed to be an authority, as to instruments and methods of work, and it rests with our great army of amateurs to make their own place in the world.

Believe in what you are doing, and people will believe in you. The work should be followed not merely for personal credit, but for the work's sake and its value as a mental and moral education. I am glad that America has several representatives at this Convention, feeling it

will do much to strengthen the bond of comradeship between kindred bodies of workers. There should be only a sense of generous emulation on each side, and the tie of relationship not be weakened, though the ocean lie between us, for each can and should gain by mutual help.

As our great poet Lowell says,—

"For mankind are one in spirit, and an Impulse bears along,
Round the earth's electric circle, the swift flash of right or wrong.
Whether conscious or unconscious, yet Humanity's vast frame,
Through its ocean-sundered fibres, feels the gush of joy or shame;
In the gain or loss of one race all the rest have equal claim."

Remarks of a complimentary nature to Miss Barnes, and on the Chicago Exhibition, were made by Messrs. Taylor, Ward, Bothamley, Sturmey, Hepworth, and Dr. Mitchell.

On Wednesday evening the following paper, in the author's absence, was read by Mr. Cembrano:—

DEFICIENCIES IN THE TRAINING OF PHOTOGRAPHERS.

By E. Howard Farmer.

Early Guidance.

When it is known in the early life of a lad that he will probably become a photographer, his training should commence during the latter years of his school life. His studies can then be guided in directions which in after-years will be directly useful to him in his professional capacity, and he will acquire knowledge readily that may later save him much labour and effort.

Where this has been done it will be generally found that the directing parent is a photographer or connected with photography, and in such cases the same forethought which has guided these early studies into useful channels has probably continued their direction to a successful *dénouement*.

Importance of Continuity.

But the majority of those who become photographers have their career decided after leaving school—sometimes a good many years afterwards, and it is to these my remarks more especially apply.

We may suppose a lad has left school, and not until he has subsequently spent a year or more in holiday-making is the important decision made as to what his life's work shall be, and steps are taken to start him on his career.

Now, while the whole of our sympathies may go to aid the lad's pleasures in the heyday of his youth, the stern competition of life enforces the doctrine that this, the most valuable portion of his life from an educational standpoint, must be utilised to the utmost, and in doing this there is no need to deprive him of his pleasures, but they must come in as a complement, forming natural divisions to his work.

It is well known among teachers that the assimilative power for new knowledge usually falls off very much after the age of twenty or so is reached. This is especially the case when a lengthy gap or interval has been allowed to occur in the training, and a mass of evidence to support this occurs with photographers in the very small proportion who, however hardly they may be pressed, attempt even to increase their knowledge; and the steadfast application required from those who do, it is not too much to say, that independent of the inferior value which knowledge acquired at the age of twenty-five to thirty possesses, as compared with the same knowledge acquired at from fifteen to twenty, the labour and application necessary in its acquirement is three or four times as great at the more advanced age.

It is from considerations such as these we are forced to conclude that in allowing a lad's training to stop suddenly when he leaves school, even if only temporarily, not only are the best fruits, which might readily follow from the cumulative effect of his previous training left ungathered; but, before he has arrived at an age when he himself may fairly be held in some measure responsible, his future status is placed in jeopardy.

Deficiencies of the Apprenticeship System.

We may next suppose that the lad forming our example is apprenticed or placed to learn his trade with some firm of photographers. In accomplishing this, the parent very frequently considers that he has now fairly started the lad on his career, and, so far as any further training is concerned, leaves it to the care of his employers and the lad's own devices.

Almost universal as such a method of starting a photographic career is, the demonstrable insufficiency of such a procedure is only too complete. In the first place, the professional education, excepting so far as acquiring manipulative skill and a knowledge of some aspects of the commercial economy of the business is concerned, leaves off where it ought to begin, and, although no one will hesitate to admit the prime importance of manipulative skill and of business methods, the trained photographer nowadays requires a great deal more in order that he may attain any *status*. In the second place, even the manipulative work is confined to one or two specialities, whereas the student wants at this, the very early stages of his career, and before specialising, trial practice in all branches. Thirdly, the skill acquired will depend largely upon the attention devoted to the student by the employer and fellow *employés*, which introduces an element of uncertainty into the training, and to which may be added the inevitable proportion of time which is wasted or during which no progress is made. There are also other reasons which at first sight are not so obvious; why the old system of apprenticeship, which is fast disappearing in other trades, must also in photography disappear, or be largely modified and supplemented, in order that the photographer may not only acquire an honourable *status* in his profession, but also keep on a distinct level above his neighbour the amateur.

Technical and Art Training—the Necessity for.

After his training has commenced, our supposed young apprentice finds there are at least five distinct sides to his subject, as follows:—

1. The Practical or Manipulative.
2. The Technical.
3. The Commercial.
4. The Artistic.
5. The Scientific.

Each of which requires his attention in a greater or less degree according to the character of the work to which he intends devoting his abilities. To convey some definite idea of the average relative importance of each of these divisions, it will be necessary to consider them individually.

1. *Practical.*—The manipulative skill required for most branches of photographic work is not of a high order; for example, the actual operations involved in the taking of a portrait negative are all of a fairly easy character, and require but little experience and practice on the part of a student to perform them with regularity and success. Notwithstanding this, the chief help which the student usually derives from his work in the studio is confined to a sufficiency of experience in these easily acquired manipulations.

There is, however, one special branch of studio practice which requires a very high degree of skill, and that is retouching. In other departments of photography also, such as working large wet plates successfully; some portions of process work; and others, considerable manipulative skill is essential.

2. *Technique.*—It is not difficult to show that the main foundation of photography, as a profession, lies in its *technique*.

Whether in the artistic or scientific departments; in landscape; seascape; motion; architecture; reproductions; or printing processes; the worker who is trained in either of them is the one who excels; and on examination, it is found that the success depends not so much upon any particular difficulty in performing the necessary operations as upon *a complete familiarity with the minutiæ and details of procedure*, which give the best result under particular conditions. The reason that several years' training is commonly necessary to get a fair percentage of successful results in any one of them is due to the fact that the worker has not had the opportunity of learning, in a systematic form, the *minutiæ* and special factors which govern different classes of work, but is left like a man groping in the dark to find his way slowly and laboriously by the method of trial; and, even if he has the guidance of a fellow-worker, it is one who has found it himself by trial and experience, and can only impart it in the same manner.

Take two beginners of identical abilities, perseverance, and general education; give both the average training obtained as apprentices to a photographer, and give one of them, in addition, systematic instruction in *technique*. The latter will become as good a photograph in one year as the former will in four years, and will ultimately become a much more competent and independent worker.

3. *Commercial.*—Important as a training in commercial economy undoubtedly is, which includes such subjects as economy of time, material and wages; value of specialism and enterprise; punctuality, tact, and politeness; treatment of employer and *employés*; accommodation to circumstances; and, in fact, all the *minutiæ* which together form the system of a successful business man; this side of his training is one which, in great measure, would be the same in all trades, and which therefore is rather included in his general education than in his specially photographic one. That photographers as a body are behindhand in this department of their training is, however, a fact very widely conceded.

4. *Artistic.*—The value of an art training is second to none in the whole range of a photographer's studies, as it invariably gives the stamp of refinement and superiority to his work. This is abundantly

testified in public displays of photographs, where the pleasing effects produced by artistic feeling or culture deservedly take the first rank.

5. *Scientific.*—The value of a purely scientific training to the *working* photographer has, in my opinion, been a great deal over-estimated. In the early days of the art, when the worker had to go through a series of delicate chemical processes for each photograph taken, and when the successful performance of these processes was alone sufficient to tax the knowledge and skill of one individual, it may have been true that a trained scientist was the best man. But, in these days of dry plates and ultra-simplified printing processes, photography, except in its purely scientific divisions, is being lifted above a test of chemical knowledge or optical expertness, and, in taking its place as one of the most valuable handmaidens the fine arts possess, must sooner or later be admitted into partnership with them.

The chief use of a knowledge of chemistry, molecular physics and optics to the photographer, independent of the general educational value; lies in their giving him a clearer insight into the sciences utilised in his work, and thereby inducing an interest which acts as a powerful antidote to the apathy which is so fatal an enemy to progress.

More Care Required in Specialising.

Another division of his subject is recognised by the photographer more and more clearly as his work proceeds. Having probably started by associating photography with taking portraits only, he becomes conscious of fields and scope for work in which portraiture plays no part; he finds workers devoting the whole of their time and energies to landscapes, to copying, to architecture, to printing, or to process work; and even in portraiture alone he finds one worker devoting himself to operating, another to retouching, and a third to printing. He begins to realise that it is impossible for an average individual to master every branch of photography, and so it comes about that he, like the others, has to select some departments and reject others—in fact, specialise.

In doing this, he is usually guided by what he considers the most lucrative portion of the art, and in most cases portraiture seems to be chosen. It is, of course, a matter of opinion as to which branch of photography offers the most lucrative openings; but in my opinion the prospects of a landscape or general worker, or a reproductionist, at the present time, are better than those of a portrait photographer, these prospects being not so much in the silver print as in the collotype film, the copperplate, or the type block.

There are other factors also which should be considered in deciding upon the direction in which to specialise. The probationist, while it is still in his power, should be guided more by his own capacities and temperament than he is at present. If he likes indoor life and delights in the human figure, he would be unwise if he did not take up portraiture; but, if an outdoor life suits his constitution and tastes, he would be equally unwise if he did not specialise in landscape or other outdoor work. For town life he must be more expert and specialistic than for country life, for which a good general excellence is better suited. And, again, according to his proclivities, he should choose the artistic or manipulative sides of his subject.

Whatever special branches he ultimately adopts, a good general commercial and art education, and a good technical and trial knowledge of all the principal photographic processes, with their individual applications and possibilities, should form the basis of his work.

Evidence of the Present Insufficiency of Training.

Evidence of the insufficiency of the present system of photographic training is everywhere present.

In the extremely limited range of most workers' skill, which, while good in itself when carried to sufficient perfection, and supported upon a general foundation, is frequently mere rule of thumb, so that the results are capricious, and, in taking up new processes or methods which the progress of technology or discovery may render advantageous, the worker finds himself but little better than a novice.

In the deficiency of technical, artistic, and general knowledge so commonly met with, which, while it is excusable among those who, interested in photography, are not expected to know its minutiæ; it is inexcusable among those who, by their calling, are expected by a public—quick to criticise harshly—to have been properly educated in the art they profess.

And, last but not least, in the surprising facility with which a determined outsider will place himself on a level with workers of a lifetime.

The Probable Remedy.

It is, I believe, in the spread of a sound and largely extended intermediate and supplementary training to that of the school and the studio that the photographer will not only occupy an impregnable position as a specialist, but will also learn how to utilise to the *uttermost advantage* the factors and processes at his disposal, and in so doing will both kill the untrained competition from which he in so many cases at present suffers, and will place his business on the soundest of all foundations.

Mr. Wollaston said that Mr. Farmer had omitted mention of a particular training which was of great importance to a photographer; he referred to *business* training. Ordinary assistants and apprentices seemed to be lacking in that essential.

Mr. Ward observed that there was an almost unlimited demand for good assistants, and if quite a large number were properly educated, they would find good and permanent situations.

Mr. Welford said that while all-round men were generally desired, such men, when employed, were usually given one special thing alone to do.

Mr. Anckhorn considered that if an assistant pushed his way he would get on. Young men should have proper training, and be indentured for a term of years. If a clerk or business man was wanted, they could get one at a pound a week.

Mr. H. M. Smith said that Mr. Farmer seemed to want a gentleman who was a paragon of all the virtues—one who was a good scientific man, a good business man, and a good photographer. But a scientific man was not usually a good business man, and, contrary to Mr. Anckhorn's statement, you cannot get a good clerk at a pound a week.

Mr. George Mason stated that the position of operators depended upon themselves. They ought to be able to retouch, so that when any department is vacant they could step in and fill it. The man who taught himself would by-and-by be able to teach his employers. Many operators held ridiculous opinions regarding lighting and apparatus: some, upon entering a situation, could not work because the lighting differed somewhat from that in their previous place; others who had been using a lens or a camera by one maker could not take a picture with that of another maker, and so forth.

Mr. Kidd's experience was that a man did not desire to do more than one particular kind of work. The want of knowledge among assistants was entirely due to themselves. This was also the case in other professions and businesses.

Mr. Deed advocated the establishment of a training institution to enable photographers to rise and become higher men.

The President said that Mr. Farmer's paper pointed in the direction of which Mr. Deed spoke—the establishment of an institution where all kinds of scientific and technical knowledge could be obtained. There were certainly openings in portraiture for operators possessing highly artistic skill.

After some observations by Mr. Warnerke on Continental establishments of the nature indicated,

Mr. Bothamley occupied the remainder of the evening by giving an address on Development.

On Thursday evening the following paper was read by the author:—

THE COLOUR SCREEN IN LANDSCAPE PHOTOGRAPHY.

By Charles L. Mitchell, M.D.

The value and use of orthochromatised emulsions in landscape photography is now fully recognised; but, as yet, there still appears to be considerable difference of opinion in regard to the necessity of the coincident employment of the colour screen. It is stated by many of the manufacturers, who at present supply the market with iso or orthochromatic plates, that the use of this valuable adjunct is by no means necessary, and that equally good results can be obtained without it. Having, during the past two years, made extended trials for landscape purposes of orthochromatised emulsions, coated on both glass and celluloid films, and during these experiments made frequent use of the colour screen, a few notes on the principles and methods of its employment may perhaps be of interest. The class of subjects selected was almost exclusively landscapes, and the large majority extended landscapes in the mountainous regions of Switzerland, Norway, and Northern Italy, involving distances ranging from ten to one hundred miles. The first year the colour screen was used sparingly, but the results obtained with it were so satisfactory that in the following year it was used whenever possible, and the success attending its use was so marked, and the quality of the work so far

superior to the portion in which the screen was omitted, that I now am fully convinced that the colour screen is an indispensable adjunct for any extended or comprehensive landscape work. The reasons for this opinion are not hard to find. It is a well-known fact that, when an open landscape is photographed on an ordinary gelatine emulsion, two serious difficulties are always encountered. These difficulties bear such a relation to each other that the means employed to prevent the one always increase the evil effects of the other. I allude to the difficulty of obtaining even and harmonious exposures for both near foreground and extreme distance. The rapidly vibrating blue rays coming from the more distant portions of the landscape produce, in an extremely short time, a very powerful reducing effect upon the emulsionised silver salts, and that long before the more slowly vibrating rays coming from the nearer and generally darker foreground have had time to properly act on the plate. The consequence is that, when proper definition, detail, and colour value have been obtained in the foreground, the distance has been so over-exposed as to solarise to a greater or less degree that portion of the image. On the other hand, should the exposure be so shortened in time as to obtain proper values for the distance, the foreground is so hopelessly under-exposed as to be but an unmeaning smear of black, devoid of all detail.

All kinds of devices have been suggested for remedying these difficulties. Sky shades, shutters having apertures of different shapes fancied to diminish to a certain degree the exposure of the sky and distance, &c., have at different times been suggested, but none of these have proved of sufficient value to become popular.

The difficulties, as above noted, are particularly noticeable in the case of Alpine landscapes. Here, then, is often a foregrounnd of rocks and dark pines, abounding in dark greens and browns, and opposed to it a distance composed of brilliant snow-white peaks and glaciers, standing out against a deep blue sky, varied, perhaps, with floating clouds. With an ordinary emulsion it is almost impossible to render properly such a landscape, as the foreground will be under-timed and lacking in detail, or else the peaks and sky will be so over-exposed or "burnt out" on the negative as to render the demarcation line between snow and sky almost indistinguishable. When, however, certain colouring agents are added to the ordinary emulsion, as is done in the process of orthochromatising, an entirely new condition of affairs is brought about. I will not attempt to explain this in detail, for it has and will be done by much more able and qualified hands than mine. Suffice it to say, briefly, that while the emulsion is now, in its altered character, a little less sensitive to the action of the blue rays of the spectrum, it is more sensitive to the yellow, green, and red rays coming from the opposite end of the spectrum. A plate of this character, when exposed to the same Alpine landscape as previously tried, would exhibit much more detail in the foreground, and the distance would be in much better tone. But, although the sensitiveness of the plate, as orthochromatised, is of a much less degree as far as the blue rays are concerned, they are so powerful that they still act too rapidly on the emulsion, and it is desirable to limit still more their effect. This is accomplished by the colour screen. A suitable coloured medium, in this case yellow, is interposed between the object and the sensitised plate. This medium intercepts the passage of the blue rays to a certain extent, or diminishes the rapidity of their vibrations, and, while prolonging thus the exposure, allows the reds, greens, yellows, &c., to pass through without hindrance and impress themselves fully upon the plate. The resulting image will now represent in much more accurate colour tone, as expressed in black and white, the different values of the landscape, giving full detail and softness to the foreground, and showing in the distance white peaks against a darker sky.

For purposes of landscape photography the colour screen employed should generally be of a light yellow shade, except in some special few instances, when, to obtain particular effects in a landscape, coloured screens of more or less of a red or reddish orange may be found to be desirable.

From this brief explanation the principles which govern the employment of the colour screen may be made apparent, and on its very face the theory of its action would seem to be correct and of sound value. And I unhesitatingly assert that, when the colour screen is *properly* used, the results will, in every instance, bear out the sound principles of the theory. Landscapes when, while full justice is given to atmosphere, the distant ranges of hills are as clearly defined as they would be to the eye; water which looks like water and not an expanse of snow; foliage and verdure which show the varied shades of greens with which nature bedecks herself; or the varied tints in an autumn landscape, and clouds of white or pale grey floating on a darker sky, as we see them daily in the heavens. But a colour screen should be used with judgment, as should every other photographic adjunct, if good results are to be secured; not for every subject, or for instantaneous work, or generally for objects close at hand, but for the special work for which its usefulness has been explained. Let us for a moment consider this and its practical features a little more in detail.

The first point to be considered is the colour screen itself. This should be of glass, perfectly flatted and ground to a true surface, or else it will produce such an amount of distortion as to render it totally unfit for use. In England, I have been informed, one or two firms offer for sale colour screens made of yellow pot glass, ground and polished to a true surface. The only one of these I have been able to see was of so light a colour, and that more of a brown than a yellow, that I should feel afraid to use it. The quality of others may be better. It is very easy, however, for any photographer to prepare his own screens, and of whatever colour he may desire, by a process which I shall now describe.

Procure plate glass, thin, perfectly flat, ground, and free from all striæ or bubbles. The thin plate glass that is frequently used for making colour cells and animalcule tanks for the gas microscope will be found to be excellent for this purpose. After being cut in small squares of the size desired ($2\frac{1}{2} \times 2\frac{1}{2}$, and $3\frac{1}{4} \times 3\frac{1}{4}$, I have found answer nearly every purpose), a square should be flowed on one side in the same manner as when coating a plate with collodion, with a solution of the colouring agent in amyl-acetate collodion. The colouring agent may be either "aurine" for orange red, or any other colouring matter desired, provided it is soluble in the varnish. For the yellow screen I am in the habit of using an aniline dye, called "golden yellow," in the proportion of from five to eight grains of the dye to the fluid ounce of varnish, according to the depth of tint desired. It is permanent, does not fade to any extent, and gives a rich lemon-yellow screen. The amyl-acetate collodion, now extensively used in the United States for the purpose of lacquering gas fixtures and brass work of all kinds, is known in trade by a number of different fictitious names, such as "enameline," &c. It is simply a solution of soluble nitro-cellulose in mixtures of amyl-acetate, ether, petroleum, benzine, and alcohol, mixed in varying proportions. It can be easily prepared on a small scale by cleaning off the emulsion from a spoiled celluloid film, cutting the film up in small strips (soaking them well in strong alcohol to remove the camphor), and placing these in a bottle with a mixture of one part amyl-acetate, one part petroleum benzine, three parts alcohol, and three parts ether, all by measure. The celluloid swells up and dissolves rather slowly, hence the bottle containing the mixture should be well shaken at intervals for several days. A better collodion is made, however, by dissolving good nitro-cellulose in the above mixture. When the celluloid is all dissolved, the liquid should be filtered through a little absorbent cotton to remove any loose flecks of dirt. This varnish gives a tough film, clear and free from transversed striæ, and is also an excellent material for varnishing glass negatives or positives, being perfectly waterproof. To resume, the glass square, after having been coated with the coloured varnish, is allowed to "set" for a few moments, and then placed aside on a flat surface until the varnish is perfectly hard and dry. Care must be taken to keep it covered while drying, so as to avoid dust and dirt settling on it. The coated plate is now placed on a level surface, film upwards, and sufficient pure Canada balsam (white and free from dirt) poured on the plate to make a pool in the middle of the plate of about one-fourth of its area. A fresh, clean glass square of the same size is next taken, and gently lowered on the balsam and plate in the same manner that a cover glass is placed on a microscopic object, and then a gentle and even pressure applied until all air is forced out, and the two glass surfaces are cemented together with the balsam and are in uniform contact. The cemented plates are now laid aside on a flat surface, and allowed to remain several weeks undisturbed, until the balsam has thoroughly hardened. Then the edges are cleaned off, the exuded balsam being removed with a little benzine or benzolo, and the edges bound with some strips of lantern-slide paper. This colour screen can be placed either before or behind the lens. If before, a special hood for each lens must be made to hold it. I therefore prefer to use it *behind* the lens, on the inside of the lens board, when it can be placed or removed in a few seconds. This can easily be arranged with two small brass or wooden cleats, secured down on the inside face of the lens board, and adjusted so that the colour screen can slide between them.

The next item is the subject. It is hardly necessary to say that moving objects and all instantaneous work are entirely beyond the scope of the colour screen owing to the length of exposure required. Moving clouds can often be satisfactorily photographed when the motion is slow, and the exposure made with the full aperture of the lens from half to two seconds being generally sufficient. Large masses annulus clouds, and also the lighter and more graceful forms of

cirrus, can be made, when at rest, to repeat themselves on the photographic plate with rare fidelity by the aid of the colour screen. There are many days of the year when these remain almost quiescent in the sky, and, as no great stopping down of the lens is needed, a large aperture and short exposure will yield excellent results.

For ordinary landscape work in close proximity to the subject the use of the colour screen is unnecessary, unless some special conditions of colour exist. Still life, fruit and flower subjects, however, are especially fruitful fields for the colour screen in conjunction with the orthochromatic plate. Here time is of no importance, absolute sharpness and fidelity of detail can be secured by stopping down the lens, and, with a full exposure, every feature of the object will be reproduced. The principal use of the colour screen in landscape photography, however, is in field work, especially where extended country, and often extreme, distance, are concerned. Here the colour screen is an *absolute necessity* in order to secure uniform and satisfactory results. I have photographs in my collection taken from the summit of the Furca Pass in Switzerland, where, while the foreground is harmonious and full of detail, the Alps of the Mounts Blanc and Rosa group are distinctly visible, although at least sixty miles distant. I have also noticed in the use of the colour screen, when photographing in both Switzerland and Norway, has given much more brilliancy to the dull monotone so often noticed in the photographic rendition of long stretches of bare mountain side, it seeming to differentiate and accentuate the different tones of browns, dark greys, and greens so prominent in such landscapes. In fact, I have grown to rely so much upon the colour screen in photographing these extended views that I fear no landscape, no matter how extended, provided it is properly lighted, and I think I can show as satisfactory results for such subjects as it is possible to compress into the limits of a small photographic plate.

A word may also be said just here in favour of the use of celluloid films. Glass is as yet undoubtedly the most perfect medium of support for the photographic emulsion. But it is heavy, liable to break, and for distant landscape work apt to show halation. This latter, it is true, can greatly be prevented by backing the plate, but it is a tedious, dirty process, and involves infinite trouble. Celluloid, as now prepared in the United States, is rapidly taking the place of glass for tourists' work. It is now manufactured almost free from defects, and is so light and portable that a gross of 8 × 10 size will take up no more room, and weigh no more, than one dozen of the same size of glass plates. It cannot be broken, and, moreover, is almost entirely free from halation, owing to the thinness of the film and the consequent absence of reflecting surfaces. To illustrate its advantages, I may say that last summer I took a three months' trip through Norway, carrying with me, in a small Norwegian trunk, together with my clothing, sufficient material for six hundred 8 × 10 exposures. The weight of these films was about thirty pounds; the same amount of glass plates would have weighed over four hundred pounds—an almost insurmountable burden, unless one travelled with a baggage train.

It remains to say a few words concerning exposure and development. Exposures for orthochromatic plates should *always* be fully timed to secure soft and harmonious negatives. An under-exposed orthochromatic plate or film is much more inclined to fog on development, and is much more harsh and lacking in detail than an ordinary plate of the same speed would be if subject to the same conditions. On the other hand, the orthochromatic plate, and even more so the film, will bear an amount of over-timing which would simply be ruinous to an ordinary plate. When a colour screen is used the exposure should be prolonged eight or ten times, and my friend Mr. F. E. Ives, who is world-celebrated for his researches in colour photography, has assured me that twenty times is none too much. I have no doubt some advocates of rapid exposures will be shocked by this statement, but, when we consider the retarding effect of the colour screen, the amount of "leeway" in exposure is in consequence immensely extended. In all such work plenty of time in exposure is necessary to obtain full detail. The distance will take care of itself, so will the clouds, and unless there is a brisk wind blowing they will show up all right in the negative. Furthermore, in overcast and cloudy weather, exposures on orthochromatic emulsions, either with or without a colour screen, must be greatly lengthened, much more so than for ordinary emulsions under the same circumstances. For instance, if I gave two or three times the exposure (using an ordinary plate) on an overcast day that I would on a bright, clear day for an orthochromatic plate (using no colour screen), I should give from *four* to *eight* times the exposure, and, if I did not do so, I should get an under-timed plate. If a colour screen is used in addition, the exposure should be increased proportionately as previously mentioned. Most of my failures with the colour screen and orthochromatic film have been from this cause—under-timing on cloudy days. There seems to be, under these circumstances, an absence of certain light rays in the atmosphere (yellow perhaps) which ordinarily affect more quickly the orthochromatic emulsion. After I discovered this I have frequently, after making an exposure, the time of which I had judged should be ample, made a duplicate exposure, in which for purposes of experiment I doubled the exposure, and almost invariably the longer-timed negative came out the best.

Finally, a word or two may be said regarding the development of the exposed plate or film. The developer used must depend largely upon the purposes for which the negative is to be used. If for bromides, lantern slides, or transparencies, my preference is for the mixed developer of eikonogen and hydroquinone, it giving negatives possessing the full detail and quick-printing qualities especially requisite. For platinotype, plain silver, and kallitype, I am growing to believe that pyro gives perhaps better results. The steel or blue-grey image produced by the mixed developer gives a density which seems greater than in fact it really is, and in printing processes which tend to diminish contrast it will not give as brilliant and "plucky" a print as will the slightly yellowed pyro-developed negative.

During the reading of the foregoing paper, Dr. Mitchell exhibited several specimens.

Mr. Bothamley said, that in the absence of the colour screen, frequently no advantage was gained by ortho-chromatic plates. This he had ascertained by experience when photographing on the Wye with Mr. Pringle in 1889. In summer, and with foliage, there was less advantage than in spring and autumn. He used plates colour-sensitised, by dipping in a bath of erythrosine and ammonia, and this, with a lemon-coloured screen, was very sensitive.

Mr. Warnerke asked whether a matt, or a polished surface of celluloid, was best to be coated with emulsion.

Dr. Mitchell was not yet prepared to say. Opinions differed.

Mr. Wollaston endorsed what Dr. Mitchell had said regarding photographing on a cloudy day.

Mr. J. Traill Taylor said, that when making a colour screen, instead of having to wait several weeks before it was ready for use, as mentioned by Dr. Mitchell, the operation could be completed in one or two hours by applying heat to the balsamed plates, as done in cementing lenses.

Several speakers, including Messrs. Tate, Weir-Brown, Keene, and Miss Barnes, then made remarks on the subject of orthochromatic photography, but the chairman pointed out that the subject was the colour-screen, although he would express his opinion that the photographer who once got at home in working orthochromatic plates with the screen, would not readily give them up for ordinary plates.

Mr. Ward then brought forward a motion that a request from this Convention be forwarded to Chicago to request that facilities be afforded all photographers to take pictures during the Exhibition there next year. This was unanimously agreed to.

The following paper was agreed to be taken as read:—

HOW TO LOOK AT PHOTOGRAPHS.

By F. M. Sutcliffe.

Photographs are generally said to show either technical or artistic excellence. Sometimes both qualities are visible in the same piece of work, sometimes they are not. There is another quality which ought to be present in all photographs, without which no photograph can be considered perfect; and, until this quality has been recognised, the photographer should stop before he pats himself on the back and says, "What a good boy am I," after he has taken what he may look upon as a perfect piece of work, as an example of technical skill, or as an attempt at picture-making; it may be clever, yet for all that it is a failure if it cannot *speak* to those who look at it.

There has been, as you all know, a lot of strife between what has been called the old school and the new, or the sharp and the unsharpened; it seems to me that, if both these parties had looked at their work and at that of others in the right way, all this bickering would not have been. It would almost appear as if many consider their photographs as an end rather than a means to an end, and as if all that is expected of the spectator is that he should admire the skill of the worker as shown in his work; sometimes even it appears to be the *author* of the work who expects to be admired. Only the other day this was strongly impressed upon me. A youthful photographer was pointing out the beauties of what he considered a most successful picture, which he had just finished, to one of our oldest photographers, saying how he had been advised to place a figure at such a spot, but did not, because and because, seeing the old photo-

grapher smile, he stopped in his oration, and, I hope, received a useful lesson when the old one said: "Pardon me for smiling, but I was thinking of a whipping I once got for falling into a horse-trough the very image of the one you have there." That old photographer knew how to look at photographs, for he was able to make them speak to him and recall to his mind bygone days. The person who looks at a photograph as a complete picture, unable to say anything about anything except the facts which existed at the moment of exposure, does not see very far. You may contend that, if this is true, it will depend more upon the spectator than upon the photograph, for what will give pleasure to one will say nothing to another. To be sure, if the spectator is blind to everything except the mechanical part of the work, the loss is his alone; but he need not, as he often does, call attention to his own ignorance by denouncing a picture a failure because his mind happens to be blank except so far as a knowledge of a certain kind of mechanics may go.

If a photographer thinks he can tell his tales better by making his works microscopically sharp, let him do so by all means; if any one's hobby is the study of mosses and fungi, no pinhole or spectacle-lens view will remind such an one of the happy days he has spent in poring over over damp walls in musty nooks and corners. To some an extremely sharp picture may be positively painful, for it will perhaps disturb and break the train of thought, whereas a less-defined one would allow the mind to wander at its own sweet will. At the last exhibition of the Photographic Society, the hanging committee, the secretary, and the judges had the opportunity of studying a few works which the rest of the world were not allowed to see. I don't allude to those which were hung on the floor, and afterwards consigned to the cellars, but to a small collection of pictures by the worthy President of this Convention. Among them was an almost ideal photograph. I don't mean that it was so uncertain and undefined that it could have represented anything the spectator might have been pleased to wish, but it was just enough to start the mind along a pleasant channel. The foreground did nothing more than carry the eye to the principal object, and when it got it there the eye was politely asked to take a seat, and the mind then began to entertain the spectator, and picture after picture were put before him; one heard the wind blowing and whistling through the mill sails, then it almost died away, only to come again in louder and louder gusts. Now the miller and his man come out and look anxiously, first at the yellow sky, and then at the wands, from which they take in nearly all sail. Yet the big arms rush round at a fearful rate as the sky gets darker and darker; what an enormous size the mill looks—did you ever go underneath a mill's sails in the dark? What terrible things the arms are—they are more like a nightmare than anything real, as they come down threatening to crush you at every turn, yet never getting any nearer. Then, perhaps, you awake from your dreams, only to find yourself inside the mill on a bright summer's morning, where the snowy whiteness is but little less dazzling than the sunshine outside. You notice how spotlessly clean the floors are polished by an unending stream of golden grain; your nostrils drink in, with infinite delight, the scent of newly ground wheat. Perhaps the miller weighs you in the big, old-fashioned flowry scales, in which have been weighed, in good years and bad, the daily bread of the whole village. All this, and much more, did Mr. Davison's simple photograph say. Had it been taken by one of the cast-iron school, the same pleasant train of thought might have followed, if (mark the "if," if you please) one could only have kept at a distance of ten yards; but where is the man who is content to look at a photograph from this distance? No, it would have drawn us nearer and nearer, and every step would have disturbed the train of thought by forcing other subjects forward. Most likely the excellence of the lens would have been impressed upon us, and, once started on such a subject as cameras and lenses, good-bye to all pleasure.

You may think a windmill is a very suggestive subject—almost alive, as it were—and that it is only natural that it should have a story to tell. Very well, then, take photographic portraiture, or likeness-taking, as it used to be called; which are the successful portraits? Those which are most beautifully posed, most brilliantly lighted, and most elegantly retouched? Not a bit of it. The best portraits are those which remind us in the happiest way of the originals. Those sitters who go to be taken only to please themselves are invariably disappointed, and "serve 'em right;" for who, in their senses, wishes to be reminded of themselves? Or take views for a change. Why do people buy local views? Are they allured into spending their money because they are offered such exquisite examples of photographic art? No; all the tourist wants is something to remind him of the places he visits, something to strike a note in his memory. A few years ago I took a view, but somehow or other it did not sell at all, though it was as clear as the most fastidious could wish for. No; the view which sold was taken by the other man, though he ought to have been ashamed of it, for the grass was black, and his whites were white without any mistake. But his prints sold; do you know why? At one corner of his view was a whitewashed public-house. I learned afterwards that visitors called there to refresh. My view did not include that ugly public-house What I gained in artistic excellence I missed in sentiment and £ *s. d.*

There is another class of work which should certainly be able to speak. I mean subject or *genre* pictures; but these sometimes fail to appeal to anything but the spectator's sense of humour, so narrow is the line which divides the sublime from the ridiculous.

Turn to whatever branch of photography we will, it is hard to find one that does not provide ground for our airy palaces. You have all heard of the man who had been so badly brought up that

> "The yellow primrose by the river's brim
> A yellow primrose 'twas to him,
> And nothing more."

Somewhere on the walls of this room you will find a photograph of some animals—sheep and lambs. Now, this little photograph will most likely say to you what the yellow primrose ought to have said to the unfortunate man. It will remind you of the days when you were young and innocent as the lambs; it will remind you of successive spring-times, of the birth of many happy years. Young lambs always remind me of a photographer I knew when a boy. He was always singing—

> "If I'd as much money as I could tell,
> I wouldn't go crying, 'Young lambs to sell!'"

He had, like many of us, mistaken his vocation, and was consequently miserable.

If possible, whenever you look at a photograph, try to forget the photography. An architectural photograph will preach no end of sermons in stone to one who is well versed in the history of architecture, but to one who knows nothing of this art it will only tell of small stops, wide angles, and the like; it will supply him with less mental food than the view of the lambs would to a man who had never known the country, to whom sheep and lambs only meant mutton chops and lamb and mint sauce.

No doubt you are thinking, Who do you expect has time nowadays for all this dreaming, and will be saying that you want your pictures ready made without being at the trouble of making them for yourselves. If these are your thoughts, I am afraid you find the world a very hard place, for, if you take away the "make-believe" with which life is coloured, you must make existence almost unendurable.

Those among you who are unable to agree with what I have said will, I think, at least admit that it is better to take your photograph first, and then build your ideal on it, than to raise your ideal and then expect to be able to take a photograph to come up to it. I will, if you will allow me, give you an example. A customer of mine wanted his shop-front taken. By the way, shop-fronts are about the only things the amateur has left for us poor professionals to take. Well, I took the shop-front, but it failed to please. Why? Because my customer expected the photograph to rise as high as his imagination did. When I asked him to point out the faults, he said that, in the first place, the young lady looking out of the window was too short and fat, not tall and graceful, as she should have been. Secondly, a wax figure he expected next week for the window did not show in the photograph; but his principal objection was that a gilded sky-sign, which he intended having put up next winter, was not in my picture.

May I say that a photograph gives us the naked truth, which has to be clothed by the imagination.

The annual Convention dinner was held on Friday evening, and was the most successful that has ever yet taken place. There were many ladies present. Mr. Davison, in the chair, was supported on either side by Miss Barnes, Miss Carey, Dr. Mitchell, and Messrs. Bothamley and Cembrano.

The toast of "The Convention" was responded to by Messrs. Cembrano and Barclay, the hon. and local secretary. Mr. W. H. Walker proposed "The Ladies." Miss Barnes responded. The toast of "The Photographic Press," given by Mr. Wm. Lang, jun., was acknowledged by Messrs. Taylor, Sturmey, Wall, Welford, and Ward. Mr. Bothamley gave "The President," who responded. The songs, recitations, sentiments, and anecdotes were numerous, and were contributed to by Miss Barnes, Mrs. Mason, Mrs. Werner, Mrs. Warneuke, Dr. Mitchell, Messrs. Joseph Cox, Bridge, Crooke, Mason, Werner, Welford, R. Cranston, H. M. Smith, T. Scott.

The party present numbered about a hundred, and the utmost geniality prevailed.

The excursions were well attended, and the weather being fine, innumerable pictures were taken, a noticeable feature being the number of ladies who carried and made good use of hand cameras.

On Saturday morning an open meeting of the new Council was held, Mr. Bothamley presiding. The Hon. Secretary (Mr. F. P. Cembrano), in making his financial statement, stated that from the members' subscriptions they had got so far 59*l.* 5*s.*, and from advertisements 16*l.* 5*s.* The local expenses amounted altogether to 40*l.* 14*s.* 3*d.*, and he hoped there would be a small surplus. After a little discussion, a motion, proposed by Mr. G. W. Webster, Chester, and seconded by Mr. George Mason, Glasgow, was adopted, authorising the Council in future to take such steps as might be necessary to make the Convention self-supporting. Votes of thanks terminated the proceedings.

The election of the president for next year was then proceeded with, and Mr. George Mason, of Glasgow, was unanimously elected to that office.

It was felt that the Convention was very deeply indebted to the kindness of many members of the Edinburgh Photographic Society, several of whom were most assiduous in their attention to their visitors.

We have seen proofs of the large Convention group, taken by Mr. Alex. Ayton, jun., and the smaller one, by Mr. John Stuart. Both are excellent.

Our Editorial Table.

The Practical Index of Photographic Exposure.

By A. R. Wormald, Sutton, Surrey.

Mr. Wormald's little pamphlet has now reached its seventh thousand. This edition has an appendix on the speed of plates, as indicated by number of times, sensitometer numbers, &c., in which, *inter alia*, the author casts doubt on the value of sensitometer numbers, as adopted by some plate-makers. Tables of the probable average speeds of some of the principal plates are given.

Mr. Wormald also sends us his cheap tripod head. This consists of a wooden triangle, on the under side of which are attached three revolving rollers, into which three very light legs are screwed. The head and stand cost (for half-plate) 3*s.* It is a marvel of cheapness.

Guenther Wagner's Transparent Albumen Colours.

C. A. Rudowsky, 3, Guildhall-chambers, E.C.

Mr. Rudowsky has shown us several photographs most skilfully coloured with the above preparations, the advantages claimed for them being that they are liquid, ready for use, need not be rubbed on a palette or diluted with water; work satisfactorily on all kinds of glossy photographic or photo-lithographic papers, are perfectly transparent, dry with a gloss, can be applied without difficulty, have a high degree of permanency, and are not affected by the burnisher or by the application of collodion. The colours are equally available for lantern slides and transparencies, and, from the specimens submitted to us, we have no doubt that most artistic effects can be produced with them. They should be welcome to amateurs.

For spotting purposes, Mr. Rudowsky also has Wagner'e albumen retouching medium in a variety of photographic tints. These can be applied in the finest spots as well as in the most delicate lines. They will, by themselves, or mixed with one another, yield every hue desired, and will stand the hot burnisher. For professional use these media should prove a great boon, and only require to be known to secure appreciation.

Coloured Photographs on Silk.

Mr. C. H. S. Schultz, of 16, Haupstrasse, Schöneberg, Berlin, who is at present in this country, has shown us specimens of coloured photographs on silk, produced according to a recently patented process. The silk, which is of a special nature as regards its translucency and texture, is sensitised and printed in the ordinary way, a rather weak print being aimed at. It is then coloured from the back with dry pastel colours, and the resulting pictures are of a most artistic description, especially in the rendition of ladies' dress fabrics, &c. We can conceive that such colour photographs would be very popular, and it is in its favour that the process is easily worked.

The "Sandell" Plates.

R. W. Thomas & Co., Limited.

We recently made some trials of the Sandell plate ("General" rapidity), and can therefore speak from actual experience of the value of the claims made on their behalf. In cases of considerable over-exposure purposely given, we found that by removal of the surface veil by ferrid-cyanide excellent printing negatives were easily to be obtained, whereas, in ordinary cases of over-exposure, it would have been difficult, if not impracticable, to get results equally as good. The "Sandell" plates should render the plate-user practically indifferent to the terrors of over-exposure. Their halation-preventing properties are also conspicuous. Our exposures included tree tops on a background of bright sky, against which the leaves and branches were sharply defined without exhibiting the least encroachment of the lights. But what perhaps impressed us as much in favour of the "Sandell" plate as anything else was the extreme ease with which, for such a rapid plate, the fullest density could be obtained with a normal and yet very rapid exposure.

Sun Pictures from Many Lands.

London: Hazell, Watson, & Viney, Ld. Office of the *Amateur Photographer*, 1, Creed-lane, E.C.

This elegant volume is the outcome of one of those "Holiday with the camera" competitions which are so popular among the readers of our contemporary. The literary matter is derived from numerous descriptions of holiday outings, in which the respective authors have contrived to condense a great deal of readable information of a topographical, historical, and photographic nature. Several of the essays are illustrated from photographs by the authors in a manner which the editor claims as a novelty in this country, a great many well-selected and charming collotypes in various tints being interspersed throughout the text. A couple of excellent detached Woodbury-gravures are also given. Collotypic printing in "Sun Pictures" reaches a high level of excellence, the volume, as a whole, being most creditable to publishers, printers, and editor alike. An index of contents, however, would have been welcome.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 12,857.—"An Improved Box for Developing Photographic Plates and Films without the Use of a Dark Room." Henry Curties, 13, Heene-terrace, Worthing, Sussex.—*Dated July* 13, 1892.

No. 12,872.—"Improvements in Transferring Prints to Glass or other Surfaces." Arthur Martyn, 209, The Grove, Hammersmith, London.—*Dated July* 13, 1892.

No. 12,917.—"The 'Make Sure' Camera." George Chappell, 5, Great Stanhope-street, London.—*Dated July* 14, 1892.

No. 13,086.—"Improvements in Photographic Cameras." Wilhelm Hoffmann and August Klumpp, 61, Fore-street, London.—*Dated July* 16, 1892.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
July 25	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 25	Gloucestershire	
,, 25	North Middlesex	Jubilee Hall, Hornsey-road.
,, 25	Rossendale	Townsend-chambers, Rawtenstall.
,, 26	Great Britain (Technical)	50, Great Russell-st., Bloomsbury.
,, 26	Lancaster	Storey Institute, Lancaster.
,, 26	Leith Amateur	
,, 26	Warrington	Museum, Bold-street, Warrington.
,, 27	Bath	Roy. Lit. & Sc. Inst., Terrace-walks.
,, 27	Burnley	Bank Chambers, Hargreaves-street.
,, 27	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 28	Birmingham	Lecture Room, Midland Institute.
,, 28	Hackney	Morley Hall, Triangle, Hackney.
,, 28	Halifax Photo. Club	Mechanics' Hall, Halifax.
,, 28	Hull	Royal Institution, Hull.
,, 28	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 28	Liverpool Amateur	Crescent Chambers, 3, Lord-street.
,, 28	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 28	Oldham	The Lyceum, Union-street, Oldham.
,, 29	Cardiff	
,, 29	Holborn	
,, 29	Maidstone	"The Palace," Maidstone.
,, 29	Richmond	Greyhound Hotel, Richmond.
,, 29	Swansea	Tenby Hotel, Swansea.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

July 14,—Mr. Beckett in the chair.

Receipt of a copy of a work on *Bromide Enlarging*, sent by the Fry Manufacturing Company, was acknowledged.

Loss of Density in Fixing.

Mr. J. S. Teape said that many people ignored the idea that there was any loss of density in the fixation of a negative, and he would like the opinions of others on the subject. He himself found that, take it generally, there was a very considerable reduction. Some negatives might have a pretty apparent reduction of the image when the small amount of light in the dark room prevented them seeing the actual density. For the purpose of deciding the point, he had carried out an experiment. He had cut a plate in halves, exposed the halves together to a transparency, and developed further than he should have developed for ordinary purposes. Having fixed one half, he washed the developer from the other half, and examined both in daylight. The half which had been fixed would have been a fair printable negative, but the unfixed half was so dense that he could only just see the image. Upon fixing it out there certainly was a considerable reduction of the image.

The Chairman observed that when he was working with negatives by a weak light, in making copies or enlargements, he found that he had to keep the developer on for a much longer time in order to get density.

Mr. W. E. Debenham thought the idea that there was any reduction of density was a mistake. There might be a great apparent reduction, simply from the amount of semi-opaque matter in the film, which alters the light so much in its passage through as to give the idea that it was a much denser negative than it was; but as soon as the bromide was removed, more light got through the film, and one could see the proper density. The negative would appear much denser in a weak light than in a bright light.

Mr. P. Everitt said the difference in the thicknesses of films might account for the apparent loss. Again, was metallic silver soluble in hypo, so that the negative might be supposed to be reduced in the fixing?

The Chairman observed that he always had a loss of density in weak light.

Mr. Debenham asked what the chairman meant by weak light, and thought that he was confusing two things: one was weakness of light where the light was proportioned throughout the whole scale, as in making a transparency in the brightest summer or winter. Then, as to weak light with a snap-shot, the difference between the highest lights and deepest shadows not being so marked, there was no difference when the light was proportioned throughout. Given a proportionate exposure, the ultimate result is the same. It had been said that a small stop was supposed to give a weak image, but he had never been able to find any difference in the results.

The Chairman said with a snap-shot they perhaps got a poor exposure, and in the winter they would have the same thing very much alike.

Mr. Debenham said that in that case it would be better to say the loss of density was noticed with under exposure.

The Chairman substituted the term insufficiency of light.

Mr. Teape said that this was only one phase of the matter. Another was where proper exposure was given. The question was, What was the cause if the loss existed?

Mr. Everitt believed the "loss" to be due rather to the nature of the film than the action of the fixing bath. He had noticed it with plates made by himself which had a large proportion of iodide of silver. The yellowness of the film, due to the iodide, added materially to the density of the image.

The Use of Bromide in Development.

The Chairman asked what was the practical use of bromide in development?

Mr. Debenham said it enabled one to develop for a long time without obtaining fog in the shadows, and might enable one to get greater density, and also a brighter image throughout, where, in the absence of bromide, there would be veil.

The Chairman had seen it stated in one of the journals that a ten per cent. solution of bromide destroyed the latent image.

Mr. Everitt suggested that a little ferridcyanide might have been present, and that would destroy the image.

The Chairman said if the statement he had referred to was correct, the bromide must have the same effect in the developer.

Mr. Teape found at the start of the gelatine process that he was continually getting over exposure, and used to commence development with a solution of bromide alone, adding the pyro drop by drop, but he had never experienced the effect referred to.

The meeting shortly afterwards closed.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

HELIOCHROMY.

To the Editor.

Sir,—I see, from Mr. Ives's reply in your issue of July 15, that he is personal and suspects my truthfulness. I cannot as a gentleman follow him in that way.

If he has any real official document to prove the truth of his assertions against me, he can publish it. I don't fear it. The photographic world knows me longer, and perhaps better, than him.

It is very singular and significant of his style of argument that he again asserts that my principles were "not in accordance with the Young-Helmholtz theory" in spite of Helmholtz himself, who acknowledged my heliochromic prints, and said that they were in accordance with his theory (*vide* the Journal, p. 446). I am sure that the world will believe Mr. Helmholtz in preference to Mr. Ives.—I am, yours, &c.,

Berlin, July 17, 1892. Dr. W. H. Vogel.

COPYING PHOTOGRAPHS.

To the Editor.

Sir,—I have not observed in the numerous exposure tables compiled for photographers any special instructions for copying engravings and photographs, especially platinotypes. We so often wish to reproduce a good photograph, either of the same size as the original or reduced, in order to give copies to friends, &c., that such instructions would be considered a boon by amateurs. Neither is it at once apparent how the calculations are to be made. When the normal focus of the lens becomes much longer, as it does in copying, all the measures marked on the lens, mount, &c., are in such cases quite useless; and it becomes necessary to remeasure the diameter of the stop used, and the new distance from the stop slit the screen in each case, in order to calculate the intensity of the light.

Then, again, I think, in copying a monochrome such as a platinotype or engraving, other conditions of development and intensification obtain than in the case of an ordinary landscape or portrait, and, in order to obtain the best results, a special table and special instructions for the use of copyists would be of great advantage. Do these already exist in a separate form?—I am, yours, &c., Ethel Constance May.

July 19, 1892.

CORRECT EXPOSURE.

To the Editor.

Sir,—Mr. Michael quite ignores the concluding paragraph of my last letter, and it is very difficult for me to believe that he wrote the first and third paragraphs of his letter, appearing in your issue of last week, in real earnest. If he did so, I will endeavour to explain myself to him more clearly, using his own example.

With two lenses, one of eight-inch focus, and one of four-inch focus, used with an identical stop of one inch in diameter, the number of rays of light from any unit of surface of the landscape which pass through the stop will, in the case of both lenses, be the same, for the area of the stop is the same. But, as the image formed by these equal number of rays of light will, in the case of the four-inch lens, be only a quarter the area of that formed by the eight-inch lens, the number of rays of light which fall upon a unit of surface of the plate will, in the case of the shorter-focus lens, be four times greater than in the case of the longer-focus one, and the effect on the plate will *not* be the same in both cases.

If, instead of a stop of the same area, one of the same *relative* area had been used, the number of rays of light falling upon a unit of surface of the plate would have been equal in both cases, as I pointed out in my last letter, and the effect on the plate would have been the same.

If Mr. Michael has still any doubt on the subject, let him prepare a screen, ruled into equal squares, which will represent units of surface, and photograph it with his two lenses from the same stand-point, using, first, stops of the same *absolute* area, and then stops of the same *relative* area, and I think that he will find that the results bear out what I say.—I am, yours, &c., E. Collier Green.

Derby, July 17, 1892.

PLATINUM RESIDUES.

To the Editor.

Sir,—I send you four platinotype prints—copies of paintings of Tasmanian scenery, printed on Steinbach plain photographic paper and sensitised with two drachms of platino salt to three ounces of iron solution, two of B and one of A.

I have just finished a large order of 8000 copies of same, and have kept the developing and acid bath. Would you kindly inform me what is the best means of throwing down the platinum in the said bath, and how to dispose of it—that is, would it be advisable to sell it in the colonies, or send it home?

Also, can you inform me who are the best authorities on collotype and photo-mechanical printing, and where they are to be obtained.—I am, yours, &c., C. Scott,

Hobart, Tasmania, May 31, 1892. *Government photo-lithographer.*

[The platinum pictures our correspondent sends us are truly admirable, the gradation of tone being remarkably well rendered. Information as to the recovery of platinum residues is given in the course of a leading article in the present number of the Journal. Probably, to a beginner in the practical study of process work, Mr. W. K. Burton's book on *Photo-mechanical Printing* (published by Marion & Co., Soho Square, London) would prove most serviceable.—Ed.]

COATING PLATES.

To the Editor.

Sir,—I cote my own Plates; Sum i get to thick and sum to thin; i thought of geting a Silver Spoon and Put it on and Spred it over with a Pice of glass tobing; will the Silver Spoon inger the emulshon?—I am, yours, &c., Ameture.

July 19, 1892.

[No, good "Ameture," a silver spoon will not injure the emulsion. Utensils of silver are extensively employed in commercial emulsion making.—Ed.]

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

Arthur Frederick Winter, Preston.—*Portraits of H.R.H. Duke of Edinburgh, Captain John and Mrs. Humber (Mayor and Mayoress of Preston), Master Humber, Earl Latham, Hon. W. G. Colville, and Lieut.-Colonel A. M. Moorsom.*

Cromwell Hall Warren, Bristol.—*Photograph of the refreshment building and broad walk at the Zoological Gardens, Clifton, Bristol.*

RECEIVED.—J. H.; J. S. Gladstone; and others.

MIA.—The Scotch and Irish Oxygen Company, Polmadie, Glasgow, supply gas cylinders.

G. E. T.—You might try a dilute solution of cyanide of potassium, and, if that does not remove the stain, you may conclude that the case is hopeless.

OXALATE.—Messrs. Barnard & Son publish a work on the crystoleum process, and supply all the materials for it. Their address, we believe, is Berners-street, W.

SODIUM says he is much pleased with the Ilford printing-out paper, and asks if it would be possible to enlarge upon it, using an enlarging lantern and the limelight.—No; except with such an exposure as would make the thing not worth the trouble.

T. SIDEY.—The fault of the pictures is that they are, like many amateurs' hand camera pictures, very much under-exposed. Either the shutter was too quick for the plates or the plates were too slow for the shutter. With the class of subjects enclosed an excessively quick shutter was not necessary.

DUBLIN.—The appearance described is due to the balsam with which the lenses are cemented. By warming the combination the lenses may be separated, and the old balsam cleaned off with turpentine, and recemented. Perhaps, if you are not familiar with the manipulation, the best way will be to get a practical optician to do the work.

A. W.—In intensifying carbon transparencies with permanganate of potash the strength of the solution is of little importance, though it is not advisable to use it too strong. The same end is attained by using a weak solution as a stronger one; it is only a question of time. From ten to twenty grains of the salt to an ounce of water is a good proportion.

R. BISHOP.—In marking the pictures "copyright" when they are not registered according to the Act, you are acting illegally. You have no right to claim as a monopoly what you do not possess. For example, if you were to mark a thing as "patent," although you may have provisionally protected the invention, but have not completed the patent, a penalty is incurred.

C. CURTINS.—The excellence of the reproductions of painting of Continental production, seen in the shop windows of London, is not due to any superiority in the light in which they are made, but to the skill of the operators. As a rule, the wet-collodion process is used for this class of work. We need scarcely say that full advantage is taken of orthochromatic photography.

THOMAS EVANS (Cardiff).—We have no knowledge of the person of whom you bought the hand camera, but it appears to us, that as, according to his letter, he states that a lens of four and a quarter inches focus would suit it, and you find that it does not, you have legitimate ground for complaint. Consequently, we are of opinion that you can legally compel him to return the money.

A. ALEXANDER asks which process requires the more expensive plant for its working, the collotype or the Woodburytype?—The Woodbury process is the more costly, on account of the hydraulic press with the planed steel plates, and the rolling press and plates necessary for the preparation of the paper. With collotype an ordinary typographic press, or a lithographic press, is the most costly thing required.

S. A. J.—There is no school in London, or elsewhere so far as we know, where posing and lighting the sitter are taught. The knowledge you have acquired, as an amateur, in six months will, we imagine, avail you but little in securing an appointment as operator in a first-class London establishment. Skilled operators of many years' standing are, unfortunately, only too plentiful to leave much chance for novices.

SOLIDS.—If you have the chloride of gold in solution, or, as you term it, in a liquid form, all you have to do to get it into a "solid form" is to place the solution in a Berlin evaporating dish on a sand bath, and apply heat until the water is evaporated. If, as you say, you have got rid of the acid, it will be well to add a small proportion of hydrochloric acid before commencing operations, and thus avoid decomposition of the salt.

B. JACKSON.—The "steel facing" of photogravure plates is by no means a difficult thing to those who understand the work. But our space will not admit of giving full details of the work, as it would involve writing a treatise on electro deposition. Besides, probably not half a dozen readers are interested in the matter. Our advice is, send the plates to one of the firms who make a speciality of "steel facing," particularly as you have "only one or two to do now and then."

COL. A. (India).—From the description of the behaviour of the paper, we imagine you have over-dried it. Bear in mind that a certain amount of moisture is necessary in the paper while printing, otherwise it will not tone readily. Of course, if the pads and the backs of the frames become abnormally dry, they will absorb moisture from the paper, which will practically become equivalent to over-drying the paper.

A. A.—In crossing the French frontier from Germany you may possibly meet with a little difficulty with the exposed plates, as you do not speak French; but if you provide yourself with a passport from our Foreign Office, and are courteous to the Customs officials, the difficulty will, no doubt, be surmounted. Without any suggestion of "bribery or corruption," we may mention that a franc or two often overcomes difficulties in foreign parts.

B. AND D. (Swansea Valley).—The length and width of the studio will depend entirely upon what you wish to do in it, and this you do not say. A length of twenty-five feet will enable full-length portraits to be taken, of the cabinet size, with a lens of the most suitable length of focus to use. The width may be from ten to twelve feet. If you wish for a studio for groups, &c., the length and width must be proportionately greater. If the studio is wanted only for amateur work, probably one of smaller dimensions will suffice. If you have a choice of positions, as from your letter we surmise you have, let it run from east to west, so that the light is admitted on the north side the south being opaque.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—July 26, Technical Meeting. Subject for discussion, *Modern Developers.*

MAJOR LEONARD DARWIN, formerly a member of Council of the Photographic Society of Great Britain, was among the successful parliamentary candidates at the recent general election.

PHOTOGRAPHIC CLUB.—July 27, Open Night. August 3, Outdoor Experiences. July 23, Outing to Oxted and Edenbridge. Train from Victoria at thirty-five minutes past two; from London-bridge at twenty-five minutes past two.

MR. JAMES CADETT informs us of the termination of his engagements, and his resumption of the manufacture of dry plates under his own name. He has associated himself in partnership with his brother-in-law, Mr. Walter Neall. The "Cadett" plate of Messrs. Cadett & Neall will be placed on the market on the 1st of August. The firm's works are situated at Ashtead, Surrey, and they have decided to adopt the Hurter & Driffield standard for the testing of plates. Mr. Cadett's long experience in the art of plate-making should stand the young firm in good stead in its venture. Three rapidities of plates will be made, viz., "Lightning," "Ordinary," and "Lantern."

THE POTSDAM OBSERVATORY.—In his recent inaugural address to the Berlin Academy, Professor Vogel gave an account of the important work cut for the Potsdam Astro-Physical Observatory, of which he is the head, during the next ten years. The gist of his address was as follows:—It is well known to those acquainted with the subject how greatly astro-physics, and especially the spectrum analysis of the fixed stars, have been promoted by the application of photography. When the same optical means are used, spectrum photography enables one to make measurements twenty times more exact than those made by direct observation through the telescope; and, as a result of his investigations, carried on for several years, by the new method, Professor Vogel drew up, in the beginning of this year, a catalogue of the motions in the vision-radii of fifty-one of the brightest stars of our sky. One of the main tasks of the astronomers of our time is to extend this catalogue to the utmost limits the most powerful telescopes admit of, so that it will comprise about five hundred stars. Professor Vogel has good reason to hope that the improvements of the instruments of the Observatory necessary for this purpose will be granted him ere very long. Besides their main purpose, which is the enlargement of our knowledge of the motions of the fixed stars, these spectrographic investigations have led to the demonstration of a class of double stars, hitherto only assumed to be such, the peculiarity of which consists in the extremely small distance between the components, so that contact of their atmospheres seems almost inevitable; and no optical apparatus powerful enough to render the components separately visible can be imagined. Certain relations of these systems to the so-called new stars, and especially their comparative frequency, seem to indicate that these close double stars play a far more important part among the fixed stars than has till lately been supposed, and the investigation of these relations therefore promises to be of great importance. Among the fifty clearest stars of our sky, four such stars are already recognised with certainty.

*** *Owing to the pressure of Convention matter, we have been obliged to hold over several letters, Society reports, and other communications. These will be given in our next.*

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1682. Vol. XXXIX.—JULY 29, 1892.

AN IMPROVED METHOD OF TREATING RESIDUES.

The time-honoured method of adding salt—common kitchen salt—to the washings from silver prints is always difficult to displace by improved methods; still, as the ever-increasing pressure of competition causes every professional photographer to seek means of increasing his income, it may yet be that, if he see any distinct gain, he will throw aside prejudice, and take up new plans promising gain. At the outset we may say that chloride of sodium is a very unsuitable precipitant for two potent reasons. In the first place every printer of experience knows that, when the silver is precipitated in the ordinary way, a very long time has to elapse before the last traces of chloride subside; it is necessary to have several vessels to be used in succession, so that the one first filled may have cleared sufficiently to be ready to empty by the time the rest are full. If this be not done, the liquid run off is "milky," in other words, contains a quantity of finely divided chloride of silver in suspension, and this goes down the sink and is wasted. Secondly, though the liquid may be quite clear, there is yet a considerable waste; for solution of chloride of sodium dissolves an appreciable amount of silver chloride, and to the extent of this solubility must loss accrue. If any one entertain any doubt on this point, let him very carefully filter a portion of the clear liquid standing over the precipitate, and add to it one drop of the solution of liver of sulphur, which he uses for throwing down silver from the hypo. The considerable discolouration produced is irrefragable evidence of the presence of silver.

Both these objections may be removed by using hydrochloric acid. The impure acid—the muriatic acid of the dry-salter—will suffice. It does not dissolve the silver salt, and it causes the precipitation to be more speedy, or perhaps we should say less slow, in falling, and is thus decidedly a gain in material and in time.

But even with this precipitant there is delay, and, where space is of importance, it cannot but be that some silver is wasted through insufficient time being allowed for subsidence. We have, therefore, been making a series of experiments bearing upon this point, and have devised a method which seems to be all that can be desired. Starting with a process employed in metallurgical operations, we first tried the effect of precipitating the silver as a bromide; but, try it how we would, no benefit resulted in any way commensurate with the increased expense this more costly salt involved.

Our next plan was to add to the washings some substance which would cause a more speedy falling of the chloride. After numerous failures, particulars of which need not be here recounted, we brought into use a soluble lead salt, which might be precipitated at the same time as the silver, and perhaps, by virtue of its great specific weight, assist the silver to fall by enveloping the particles of silver chloride. This plan met with complete success. So far our trials have been merely on a laboratory scale, and thus not with a large bulk of liquid; but there is no reason to doubt that, when put into actual practice, it will act in a precisely similar way.

Taking a quantity of washings obtained from prints to cause the laboratory conditions to, as nearly as possible, resemble printing-room work, and, dividing it into a number of portions of equal bulk, we placed them in a series of test tubes. The first experiment was a mere tentative trial, but its success was evident. A few drops of solution of lead nitrate were added to one test tube, and the precipitant added, a second tube having the same treatment, but with the lead left out. In number one tube the precipitate all sank to the bottom and left a clear liquid in less than a minute, while the second tube was milky half an hour afterwards, and no doubt would take a day or so to become quite clear. We next tried the effect of varying quantities, and we found that there was no gain whatever in increasing the proportion of lead salt beyond a certain small proportion. This proportion, as near as we can judge, would be about one-fifth of the silver salt present.

Next we ascertained the best form in which to add the chloride. The action was so prompt that it was needless to experiment again with bromides. The result was that, though hydrochloric acid was very quick in action, the ordinary table-salt solution was still better. It was then desirable to see whether a more easily obtainable lead salt—the acetate—would answer. It was quite equal to the nitrate.

We were thus in a position at once to formulate a method for practical use. To each jar of print washing—say, of ten gallons—add a quarter of an ounce of acetate of lead—sugar of lead, it is commonly called—and, when completely mixed, add the usual chlorine, either as "salt" or as "muriatic acid," stir for a little time, and allow to subside.

We are hoping that before long we may be able to say how the plan works in practice on a large scale, for Mr. Watmough Webster, who joined us in these experiments, has promised to introduce the method into his daily practice, for a time at any rate, and report the practical results attending what may be termed the lead method of precipitation.

THE ALUM AND HYPO FIXING BATH.

Interest has been recently revived, in connexion with some of the commercial "printing-out papers," in the almost-forgotten combination of alum and sodium hyposulphite, or thiosulphate, introduced many years back with a view, as was supposed, of securing in the one solution the hardening effects of the one and the fixing action of the other. It is at least ten years since this composite bath was first publicly mentioned at a

meeting held in the Hall of the Society of Arts, and it was at once pointed out that, as the two substances decompose one another, there was scarcely any probability of the desired end being attained, since, if the bath were to possess any fixing power, the hypo must be greatly in excess of the alum, which would consequently be totally destroyed or deprived of any action it might possess.

Although the combination was written down as useless, and practically set on one side as a merely fanciful innovation, it continued for some time to keep a slight hold on the public, some of whom claimed for it that, whether right or wrong in theory, in practice it was decidedly superior to plain hypo; and now, at the present day, it is actually coming into use again, under the recommendation of some of the leading manufacturers of gelatino-chloride papers. Under the circumstances, then, it may be worth while to examine critically what the compound solution really consists of.

It is a fact well known to the large majority of our readers that a solution of sodium hyposulphite, even when pure, is of a rather unstable nature, and that it is instantly decomposed by most acids, with liberation of sulphur and sulphur compounds. To avoid the risk of introducing any such dangerous agents into the fixing bath of days gone by, it was the practice with many to render it very slightly alkaline, especially when employed for the fixation of prints, the whites of which, amongst other advantages, were supposed to be thereby kept much purer, while the risk of fading was also considered to be lessened.

In recent years, however, a movement has been made quite in the opposite direction, and it is not long since the photographic world was discussing the merits and demerits, the orthodoxy or otherwise, of the acid hypo bath. As in the case of alum and hypo, there was at once a great outcry that the acid bath was theoretically and scientifically impossible, and could only lead to imperfect fixation and rapid destruction of the images submitted to it. Here, again, practice stepped in, and said that not only was the thing feasible, but that it was a distinct improvement upon the old bath of plain hypo; and, upon examining more carefully into the chemistry of the matter, the "rule-of-thumb" men were found to have reason on their side. If properly prepared—and many different formulæ were published—the bath, when ready for use, contained, besides the hypo, nothing but free sulphurous acid or an acid sulphite; and as this acid, unlike most others, causes no decomposition of the hyposulphite, while it possesses distinct clearing powers on the negative image, an advantage might fairly be claimed for it.

But, after all, many of the formulæ were simply very roundabout methods of simply adding the acid or acid sulphite directly to the bath, for the result was attained by adding other acids, which, by partially decomposing the hypo, liberated the agent required, the process in many cases requiring great care in order to secure the proper result. The alum and hypo bath is, perhaps, another example of taking a somewhat roundabout way of arriving at something like the result aimed at.

As all who have tried it are aware, that upon mixing solutions of alum and hypo a dense precipitate is formed, but the behaviour of the mixed solutions varies very greatly with the conditions under which they are brought together. When concentrated solutions are employed, especially if hot, the mixture almost instantly solidifies into a soft solid mass, from the sudden precipitation of alumina in the gelatinous state; with weaker solutions the combination takes place less rapidly, and the precipitate partakes of a different character, and is more easily separated from the solution. The first thing to be done is, of course, to filter out the precipitate, and the bath is then ready for use.

But now we come to the chemistry of the mixture, which scarcely seems to be clearly understood even by those who recommend the composite bath. From what transpired at a recent meeting, the idea seems to prevail that the precipitation of the alumina is all that takes place, and that a similar result would be achieved with less trouble by simply adding sulphate of potash instead of the double salt that goes by the name of alum. Such, however, is far from being the case, as we shall show, the changes that occur being numerous and complicated.

When a solution of any of the alkaline hyposulphites is heated with a salt of aluminium, the alumina, together with *sulphur*, are precipitated, and sulphurous anhydride is liberated; that is to say, sulphurous acid is formed in the solution, and the hyposulphite is converted into sulphate. Taking the mixture we have under discussion, the following equation shows exactly what occurs:—

$$\underset{\text{2 equiv. alum}}{2\,Al\,K\,(SO_4)^2} + \underset{\text{3 equiv. hypo}}{3\,Na_2S_2O_3} = \underset{\text{1 eq. alumina}}{Al_2O_3} + \underset{\text{1 eq. sulph. of soda}}{Na_2SO_4} + \underset{\text{1 eq. sulph. of potash}}{K_2SO_4} + \underset{\text{3 equiv. sulphur}}{3\,S} + \underset{\text{3 eq. sulph. anhydride.}}{3\,SO_2}$$

Thus we see that two equivalents of alum and three of hypo exactly decompose one another into a variety of substances, and we begin to see that the alum and hypo mixture may possess virtues, though scarcely such as were aimed at by the original introducer of the formula. The changes stated above take place with great rapidity when the mixed solutions are heated, but much more slowly at ordinary temperatures, especially if dilute. One care, then, in using such a fixing bath, should be to give it plenty of time for the decomposition to become complete before filtering it.

It is obvious that the hypo must be largely in excess in order to preserve any fixing power in the bath. When filtered and ready for use, the solution will contain, in addition to the excess of hypo, the sulphates of potash and soda and free sulphurous acid, to retain which as much as possible it is desirable to perform the filtration with as little exposure to the air as can be. Now, the sulphurous acid acts as a clearing agent, while the alkaline sulphates are claimed, with what reason we can scarcely say, to exercise a hardening action upon the gelatine film similar to that exhibited by alum itself. The alum and hypo bath resolves itself, then, simply into another form of the acid fixing bath, with the possible additional advantage of its combining hardening with fixing.

In making such a mixture, it is in every way desirable to know what we are doing, and what is the precise composition of our preparation. From the data given above this is easily done, for, reducing the quantities of the two materials to actual weights, we find by calculation that one ounce of alum will decompose a little more than three-quarters of an ounce of hypo. In making a fixing bath of any given strength, then, it will be necessary to add an additional quantity of hypo equal to three-fourths of the alum employed; and, if this rule be kept in view, it is possible, without altering the fixing strength of the bath, to increase or decrease its clearing and hardening capacities to any desired extent, and so we may convert the mixture into something like a definite formula.

With regard to the hardening power claimed for the neutral sulphates we are personally unable at present to say anything,

but we may point out that one of the earliest remedies for frilling consisted in adding Epsom salts—sulphate of magnesia—to the developer, and to the water in which the plates were soaked. Ferrous sulphate also was proposed by Mr. Kennett a dozen years ago as an addition to the fixing bath for the purpose of *intensification*, though the action was more probably a *clearing* one, by which the colour and contrasts of the negative were altered. In this case too an indurating action has been claimed, and probably with more reason than in the case of the alkaline sulphites; but the clearing action is undoubtedly due to some series of complex decompositions similar in general character to those stated above.

PHOTOGRAVURE AT HOME AND ABROAD.

It is a noteworthy fact that the majority of the mechanical processes of photography are worked more extensively on the Continent than they are at home, and, as some aver, with a certain show of reason, to greater perfection. In support of this idea, it is an incontestable fact that a very large proportion of the photo-mechanical work met with commercially in this country is executed abroad. Notably is this the case, and we regret to have to admit it, with the high-class photogravures, which have practically taken the place of line engravings. When one sees a fine example of photogravure in any of the shop windows of our large towns, the chances are ten, or more, to one that the imprint indicates that it was made on the Continent. We are not here alluding to the reproduction of works of foreign artists, but to those of our own countrymen.

Seeing that the greater proportion of the photogravures from the paintings of the principal artists of this country are produced on the Continent, it becomes a matter of no little interest to inquire why this is the case, particularly when we consider that the processes by which the plates are made owe their origin to this country. Most people would imagine that home photographic engravers would have several advantages over those abroad, in so far at least as British works are concerned. The proprietors of valuable paintings have, very naturally, an objection to their going out of the country, yet for the purpose of reproduction they are continually being sent away. It is true the paintings are sometimes copied here and the negatives only sent. This is, however, exceptional, for the first-class photographic engraver finds it almost an absolute necessity to have the original before him, in order that he may make sure that the colours of the picture are rendered in their true relation into monochrome. Without this being done, the plate would be valueless in the eyes of a first-class publisher, and, what is more, the painter would not sanction its publication.

It is very common, when the alleged superiority of any kind of photographic work over our own is spoken of, to hear the reason assigned for it that the light is so much better on the Continent than it is here. This reason can scarcely be admitted in this instance, inasmuch as, beyond the mere production of the negative, light is not a factor in the case. Of course, it goes without saying that excellence in the negative is an essential, and this brings us to the point, Are Continental photographers more skilful in translating the colours of a painting in a negative, or, in other words, more experienced in orthochromatic photography, than those of our country? It will be remembered that a few years ago a Continental firm reproduced the pictures in our National Gallery in a better manner than they had ever been done before. But since that time the subject of orthochromatic photography has received very considerable attention here. So far as the photographic phase of the question is concerned, we fail to see that the foreign workers possess any advantage whatever over their English *confrères*.

Next to the purely photographic aspect of the work comes the production of the engraved plates. There are two methods in vogue for making them on the Continent. One by forming the plate by electro decomposition upon a grained gelatine relief, the other by etching through a gelatine image on a copper plate with a solution of perchloride of iron. It is the latter process that is in the most general use, as it is also in England. Are the foreigners more skilful in the manipulations, or have they any special method of working that is not known to us? One can scarcely imagine either.

There is, however, another point of importance in the production of a photogravure plate beyond what may be termed the mechanical portion of the work, namely, the retouching of the plate. This, of course, requires a considerable degree of skill as well as artistic ability. If we examine a number of foreign photogravures from different plates, we shall see on some that a large amount of hand work has been expended upon them, while on others there is very little indeed. But, little as there is, it has been introduced with very great discretion, and often only where photography has failed to properly translate the different shades of colour, thus showing that the mechanical part of the work must have been very perfect in the first instance. Have the foreigners any advantage over us in this direction? There certainly is no reason why they should have. The question of printing from the plates hardly applies, seeing that, although the plates are made abroad, a considerable proportion of them are printed here.

One important item for consideration is price. It is frequently said that foreign work is cheaper than English; but this can scarcely be said with regard to photogravure, for the price charged for the highest-class foreign plates is quite as much, if it is not more, than is charged here. Again, when a publisher has paid a large sum, sometimes amounting to as much as "four figures," for the copyright of a painting, the matter of a few pounds in the cost of its reproduction is a secondary consideration to the quality of the result. The reason that has been assigned for the large number of photogravures from the works of British artists to be seen in this country, issued from foreign houses, is that Continental publishers, it is said, will generally pay a higher price for the copyright of high-class pictures than is the case with English publishers.

Whatever may be the reason or reasons, it is a regrettable fact that so much work in the reproduction by photogravure of British artists' pictures is being continually sent abroad for its execution. Particularly is this the case when we consider that we possess equal, if not greater, facilities for doing it at home.

A Photographers' Party for the Chicago Exhibition.—Mr. H. Snowden Ward informs us that he is making the preliminary arrangements for a party of photographers to visit the United States next year, in connexion with the Chicago Exhibition, and solicits suggestions for the success of the undertaking. Several gentlemen have already expressed a willingness to join such a party.

The N. A. P. P.—These are the initials of the National Association of Professional Photographers, of which body several informal meetings were held during the Convention week in Edinburgh, when many matters affecting the well-being of the Association, and through it of professional photographers, were discussed. Mr. T. Fall (the

President) and Mr. H. J. Whitlock (the late President) take a very active interest in the Association, which is apparently drawing to itself considerable support and sympathy. Probably the annual meeting will be held in London next November, when we hope to hear that the aims of the Association are in process of achievement. The Secretary is Mr. D. J. O'Neill, of 47, Charlotte-street, Birmingham, who will be happy to supply all particulars of the N. A. P. P. to those who are interested in it.

The Stops of Front Combinations.—A correspondent writes this week, *apropos* of the employment of the front combination of a compound lens, asking us to indicate the values of the stops when the half, instead of the entire, objective is used, in order to get what is practically double the length of focus. The rule is as follows: Suppose the stop, which is *f*-8, of a six-inch lens be also used when the front combination alone is taken, it is then expressed as *f*-16. If both figures be squared, it will be found that the larger is divisible exactly four times by the smaller, and the exposure has to be increased exactly that number of times. Applying this rule, our correspondent finds reason to complain of over-exposure, and appears to suggest that a shorter one would have sufficed, on the ground that he gave four times what he would have given with the entire lens. Had he made comparative tests on those lines, he would, in all probability, have found that both pictures would have been over-exposed. But this does not affect either the theoretical or practical accuracy of the ratios.

Fugacity of Bromide Prints.—The Indian climate appears to be peculiarly unfavourable to the longevity of bromide prints, the cause of their disappearance being probably due, as was suggested some months ago, to the instigation by humidity of a chemical action in the material of the paper, which converts the silver into a compound that diffuses and disappears in the support. Mr. J. S. Gladstone calls our attention to the circumstance that bromide prints in contact with platinotypes had, after two years, almost disappeared, the platinum pictures standing well and partly printing themselves on the bromide support. The high temperature, excessive humidity of air, and gentle pressure he is inclined to assign as the causes of the disappearance of the bromide prints are, if we remember, those formerly suggested for the phenomenon. The stability of the platinotypes under these conditions has been commented upon before, but we do not remember having heard of the curious fact that such images "printed off."

Fungoid Growths in Lantern Slides.—Mr. Gladstone also sends us some lantern slides with the films partly detached and exhibiting both on glass and gelatine distinctly marked growths of a fungoidal nature. From our examination it would appear as if the glass were the cause of the growth, although one might have conjectured that the gelatine would more likely to have been at fault. Our correspondent complains of some chloride plates which developed black all over, and is of opinion that such plates will not stand the climate. We could conceive of considerable risk in keeping organic chloride, that is, printing-out chloride plates in such a climate, but we are at a loss to imagine why plates of pure chloride should not keep just as well as bromide plates for negative work. Thousands of dozens of the latter are annually exported to India with satisfactory results. We should think a temperature of 90° extremely high for such plates to be kept in, but we have known of instances where a much higher temperature for a period of several weeks has not produced any ill effects on gelatine plates.

Snakes in the Dark Room.—"Z. F. G." writes to the editor of the *Journal of the Photographic Society of India*: "During these hot days it would be well for every operator to examine his dark room before shutting the door for work. A few days ago I went in my room to make some changes, and found a huge snake, not less than seven feet in length, coiled up under the table. Had I gone in to develop, I should have shut the door, and not have known he was there until I felt him under my feet." Our contemporary remarks: "This is seasonable advice for India, and 'Z. F. G.' deserves our thanks for sending it. The other day, my servant, hearing a noise in the waste-water pipe attached to the dark-room sink, began to tap it underneath, when, presently, a young cobra, nine inches long squirmed out of the hole, and from his appearance seemed to demand the reason of all this disturbance, whereupon the bearer resumed the tapping, but this time on the reptile's head, and then brought me to see it. I have a good look round when I enter my dark room." Indian amateur photography is apparently carried on under most exciting and vitalising conditions at times.

CONVENTION JOTTINGS.—I.

The Convention a Great Success.—Now that the Convention is over, we are in a better position to speak of it than in our first article, when it was still going on. It may now be asserted that, in every respect for which the Convention was established, it has not only proved a great success, but has been the most successful of all the meetings since it was first instituted; that, in short, as the Honorary Secretary said at the last day's meeting, just anterior to the formal breaking up, it has "beaten the record."

To what has this been owing? Doubtless to a variety of causes, amongst which may be mentioned the prospect of revelling amid charming, attractive, and historical scenery and places, the unusually great number of ladies present, the excellent weather, and, in a special degree, to the kindness of several members of the Edinburgh Photographic Society, whose goodness of heart and great attention to the visitors will ever live in their memories.

The Excursions.—The excursions were so planned as not to interfere with the more purely intellectual proceedings, and, as a consequence, both were numerously attended. The excursion to Abbotsford, Melrose, and the locality of Sir Walter Scott proved very attractive; and, although personally we could not form one of the party, yet did we count some ten or twelve compartments in the railway carriages comfortably filled. The next great excursion, that to St. Andrews, saw an equal number, and it was noticeable that almost every lady carried a Kodak or hand camera of some form or other. On arriving at the station we were met by Mr. A. Cowan, who (with his family, in which he so recently suffered a severe loss), was at that time a guest of the Provost of the City. The old place (it is but a small and a very quiet city) must have been seriously thrown out of its equilibrium at seeing itself the cynosure of fifty or sixty tripods planted here, there, and everywhere. It is certainly a glorious old city, and is replete with archæological remains. It is full of old buildings and ruins. Originally named Muckross, a cathedral was erected somewhere in the fourth century, and on the union of the Scottish and Pictish kingdoms the name was changed to St. Andrews. As for the priories and seats of learning which were soon afterwards established, there is no need we should go into them, but they must have had lofty ideas of architecture in those days, and certainly they built well. Here preached John Knox in later days, and he must have had a "sweet, persuasive tongue," exceeding even that of Bothamley, ere he could have induced his hearers to lay in ruins the grand old edifices of those with whom he was of a different way of thinking.

Reminiscences of Sir David Brewster.—In still later, and what we may term modern, days flourished Sir David Brewster, who was principal of one of the universities, and don't forget this, O photographers! it was from this place that the Stereoscope, the Kaleidoscope, the *Optics*, and several other inventions and works of that grand old Scotchman were issued. Hence the photographer cannot afford to turn up his nose at St. Andrews. Oh, what exposures were made that day! It was an *embarras de richesses*. But when the old castle, perched on a jutting prominence in the sea, was discovered and appreciated, then did every lady and every man begin to look anxiously to the numerical state of his reserve stock of plates, for surely here was subject for exposures "galore." The poor old castle was stormed as it had never previously been, and well did it deserve such consideration. This fortress, the guide-book tell us, was founded about the year 1200. James III. was born in it.

Cardinal Beaton resided in it, and, being afraid of the fury of the people after he had cruelly executed George Wishart, a celebrated reformer, in front of it, strengthened it with a view of making it impregnable, yet therein was surprised and assassinated. Our outfit on this excursion was a stereoscopic camera, and, after bagging many attractive pictures and exhausting our plates, we joined the legitimate return party, leaving behind some twenty or thirty others who thought the afternoon's sunshine too good to be wasted, and who returned to Edinburgh a few hours later.

Edinburgh Photographers Past and Present.—We were disappointed at not seeing at the Convention some of the members of the old and extinct Photographic Society of Scotland. Perhaps they are now, like Brewster, the President, all dead. This, we are glad to say, does not apply to Mr. Kinnear, the whilom Secretary of that body, who, in these days of summer travel, might possibly have been touring elsewhere. The privilege, however, of seeing and fraternising with Mr. R. H. Bow, C.E., one of the early members of the Edinburgh Photographic Society, was not denied us. This gentleman, before some camerists of the present day were born, had made a deservedly high reputation by his papers and articles on Photographic Optics, and we know that these works—not ephemeral, but for all time—will long survive him after he has been "gathered to his fathers." Edinburgh has reason to be proud of such a man. We know whereof we speak.

ON THINGS IN GENERAL.

THERE must be something wrong about the Convention; a very great authority wrote it down; it was to be a lamentable fiasco; yet, if reports are to be credited, never has there been so successful a meeting. Moral: Never prophesy unless you know. And what a success it has been! Our brethren across the border have shown us before how to do things, and they have repeated the lesson with variations. Perhaps more than any causes the presence of the softer element has had a large share in popularising the meeting. While on former occasions there have been a few ladies who have, in traditional phraseology, graced the Convention by their presence, there can be no doubt they felt like fish out of water—gold fish, it may be, but, nevertheless, feeling *de trop* in almost all senses. But at last they have become a constituent part of the gathering, and no Convention will be complete without them. The dinner too. Ladies at a dinner! I can safely vaticinate here; this will not be the last Convention dinner at which they will be present. Their voices, both in speech and song, were felt—no other word will better express my meaning—while as to the American guest, Miss Catharine Weed Barnes, she met with a perfect (and deserved) ovation. May this not be her last appearance on these occasions is a wish that will be cordially echoed by every one.

The papers read and the attendant discussions were pregnant with matter for further thought. It is not within the scope of a letter like this to attempt a complete criticism, but a few discursive remarks on topics that have before been touched upon may not be out of place.

Thus, Mr. Arthur Borchett's paper was very interesting, especially when he touched the fringe of the vexed question of the due rendering of objects in motion. His references to the work of great painters were apt and useful. My opinion of Muybridge's wonderful photographs is no secret—useful to the physiologist, useless to the artist, though he told me himself that Meissonier repainted a horse in an important painting more in accordance with the facts than the usual modes were proved to be by the work of the camera. By the bye, the effect upon the public of these and other instantaneous photographs is exceedingly detrimental to the work of the professional photographer. For example, I was recently informed by a well-known artist that, after photographing a favourite horse for one of his clients, with the usual difficulty in getting the position in general, and limbs and ears just as the owner wished them, a great number of plates having been wasted on the work, he was informed that, "Now I would like him taken trotting." It was almost impossible to get the owner of the horse to understand that such work was not of a kind that could be undertaken at a moment's notice, and equally difficult to explain that, if a single picture were obtained, the chances were that the limbs would be represented in a manner that might possibly appear simply ludicrous. The rendering of an agreeable-looking position is practically out of question under average conditions. I use the word "rendering" and not "rendition," as a writer of one of the Convention papers phrased it, followed, alas! by the respected Editor of this paper. If rendition has any meaning at all, which it has not, it could only be in connexion with rending, and not rendering. There, I feel relieved in my mind after that utterance.

Mr. Howard Farmer came out in a new light. We know his ability as a chemist and lecturer, but equally valuable is what he had to say about the commercial aspect of photographic training. It is too true that business ability is usually conspicuous by its absence in the photographic profession. And the more the pity. Who is there that cannot point to men of undoubted ability who have opened a professional studio and gradually come to an untimely commercial end, though their work has been of the highest class and the prices charged not excessive? Some of the most successful professional photographers started life behind the counter of a retail shop, and their experience has served them in good stead. Many of those present at the Convention dinner felt hurt at the President's remark about the Convention Group, which he characterised as the best yet done. We must assume that he alluded to its evidence of the numerical success, and that therein lay its excellence. Otherwise I can only say that there lies before me THE BRITISH JOURNAL OF PHOTOGRAPHY for 1887, in which another Scotch group—that taken during the Glasgow sitting—is *en évidence*, and in no way is it inferior, technically, to the Edinburgh group, though taken evidently under very difficult conditions.

A short time ago a writer to these columns put a query about the new platinotype paper. As there has been no official reply, I may be permitted to say that his is not the only experience of this mottliness; but, when it is remembered that the whole process, as now worked, is quite new, there can be no wonder that some of the prepared paper is not up to a certain standard. As to the excellence and easy working of the new cold-bath paper, there can be no two opinions. It is capable of producing exquisite results, in every way superior to the hot-bath process; but like every other process, and fortunately so, the materials have to be mixed with that essential to successful art, according to Opie—brains.

What a moral the great patent case recently reported in this JOURNAL provides for outsiders. A gentleman conversant with the practical issues of patenting once said, "Getting a patent through and in paying order is all bluffing and tossing halfpence, at the best."

FIERE LANCE.

PHOTOGRAPHY BY RULE.

[North] Middlesex Photographic Society.]

A RETROSPECT.

TEN or twelve years ago, when the gelatine dry plate had finally conquered the prejudices of professional photographers and the ranks of amateurs were being swollen by the accession of many to whom wet-plate photography was unknown except by name, it was often charged against photographers of both classes that their work was largely governed by "rule of thumb"—in other words, that in exposure and development, probably the two most important divisions of photography, success was allowed to depend very much upon pure guesswork, in contradistinction to system and calculation. Those were the days when the rapidity of the plate was generally underestimated; when a frequent if not common method of compounding the developing solution was by shaking an unknown number of grains of dry pyrogallic into an unmeasured quantity of water, and, after soaking the plate in it, adding thereto an undetermined number of drops of ammonia. For rapid exposures, a simple drop shutter, whose rapidity of action could easily be accelerated, but was rarely if ever reduced to arithmetical expression, was mostly used; and albumen paper held practically undisputed sway for contact printing. These broad outlines of early gelatine dry-plate photography may, perhaps, serve to convey some idea of the chief conditions of working which obtained at that period—conditions under which, be it remembered, amateurs as well as professionals pursued photography.

It is, I am sure, needless for me to indicate precisely to what extent those conditions have been changed or modified; for you are all aware that development has been lifted from the low ground of a "rule-of-thumb" operation to the level of a scientific study; the comparative

and particular speeds of sensitive preparations have been made the objects of close investigation and valuable experiments; and mechanical aids to exposure have called an apparently inexhaustible supply of inventive ingenuity into existence—the main and indeed the sole object underlying all those efforts being not merely the simplification of exposure and development, but their reference to pure rule and system. I propose briefly on the present occasion to consider some of the tendencies of modern photography—chiefly amateur photography—for which the application of this scientific method to several of its branches is responsible, and to submit a few reflections of a deductive character thereon.

Rule of Thumb.

Before dealing with that part of my subject, however, I wish to submit that the bad old "rule-of-thumb" days of gelatine dry-plate photography do not expose a very broad target for the arrows of our reproaches. Point for point, and excluding from consideration the well-directed, but unconvincing, productions of the new diffusion-of-focus school, a comparison of amateur and professional photographic work of twelve years ago with that of to-day reveals little, if anything, in favour of the latter. The portraiture of professional photographers is possibly, on the whole, more instinct than formerly with artistic feeling and treatment; but that is not a matter upon which I wish now to descant. It is from a technical standpoint alone that I desire to make the comparison. My own observations lead me to think that, technically speaking, in qualities of negatives and prints, the professional work of to-day is practically what it was a dozen years ago, taking it at both its best and at its worst. The negatives of the former period were, perhaps, not so pretty and clean to look at as those produced nowadays; but will anybody undertake to say that the resulting prints exhibit any traces of inferiority to those of the present time—that the negatives were not so well exposed, or that the prints were inferior in point of careful printing, uniformity, and depth of tone? The same question stands for all other kinds of professional work—always remembering that I wish it to have a technical bearing and no other. It is, of course, not so easy to make a comparison of amateur work, because in the times I am referring to, exhibitions were few and far between; but recalling the pictures shown at Pall Mall and elsewhere at that period, and contrasting them with those of to-day — a mental process in which, no doubt, most of you can accompany me—I fail to perceive that any distinction is to be made. Technically speaking, the work shown then was quite the equal of that shown now, and probably the average of quality was higher.

I have roughly traced the conditions under which photographers—amateur and professional, new and old — formerly had to work. Recollect also that failures were more frequent then than now. Dry-plate making was in its tentative stage, and, consequently, to the difficulties of exposure and development a large number of troubles incidental to the preparation of the film—such as are not often experienced nowadays—had to be habitually encountered. Those were the times of constant frilling, of red and green fog, and of numerous mechanical imperfections in the films; and the percentage of failures was, consequently, high. Yet, notwithstanding these obstacles and drawbacks; notwithstanding unscientific rule-of-thumb methods of exposure and development; notwithstanding a condition of knowledge of applied photography such as many to-day might be inclined, with their superior advantages, to stigmatise as ignorance, we have not, I submit, made any technical advances on the productions of that time. Tastes and fashions have changed in respect of new developers, printing surfaces, and so forth; but a change does not necessarily lead to an improvement in intrinsic quality.

A Plea for Technical Excellence.

Do not, however, suppose that I am not alive to the economical advantages of the improved developers with which we are working; of film photography, of the value of orthochromatic plates for certain classes of work, and of the remarkable cleverness displayed in countless shutters, hand cameras, and so forth. Each of these has its uses according to individual idiosyncrasies, but, if I am correct in my suggestion that in technique photography stands to-day where it stood at the commencement of the last decade, their introduction was not called for by necessity, and their existence is not essential, and has hardly been justified by results. I am unable to understand that they have improved the technique of photography. Technically good photographs, I venture to think, are not so prevalent that we can afford to regard them with the contempt bred by familiarity. At a moment when the art aspects and attributes of photography occupy so much attention, perhaps a plea for technical excellence may not be misplaced. While I have, I hope, as keen an appreciation as any one not an artist of what is artistic in photography, I am equally ready, and I trust capable, of appreciating what is technically good in any photograph, whether it makes pretension to being a work of art or not. Definition, however finely rendered, appeals to my sense of the fitness of things in the contemplation of photographs of architectural subjects, and I am unregenerate enough to prefer it to fuzziness in landscape work, with or without figures. Definition, or sharpness to a refined degree, is in practice not so easily or invariably obtained; a photograph is not so frequently taken from the correct or the most favourable point of view; distortion and other optical imperfections are not so often absent as the critical might desire; the negative is not always so carefully exposed and developed as to secure all the detail and the gradations of the subject; the printing process chosen does not so often do credit to the discrimination or the selective faculties of the photographer; and the resulting print does not so often embody the essentials of what a good print should be, that we can afford to treat excellence of technique with indifference when we meet with it. A perfect photograph of even the most commonplace object is, I consider, a tribute to the skill of the photographer, and from a technical point of view is just as calculated to evoke the admiration and the approval of photo-technologists as an art-photograph is that of an art-photographer. A line drawing to scale of a great public building by an architectural draughtsman has certain elements and qualities in it which appeal to the cultivated perceptions of an architect. Your artist may sneer at its "mappiness," but he dare not and cannot impugn its proportional accuracy and its fidelity. On the other hand, when the artist idealises the same building in his painting, how easy it is for the architect to discover faults of perspective, proportion, and drawing! At the Royal Academy there is (or was) a room devoted to architectural drawings, and, I believe, it is on record that some years ago some such disparity as that which I am now hinting at was pointed out and commented upon.

The Focussing Screen the best Actinograph.

Heretical though it may sound, I do not think that the cause of photographic technique is in the least likely to be advanced by the present disposition, especially among amateur photographers, to base the making of the photograph as much as possible upon rule and system. The rule of thumb and pinch of pyro days of photography are, perhaps, over—thanks, not I believe, to formulæ-mongers and mechanico-arithmeticians, but to the fruits of experience and experiment. I consider it an unfortunate thing in several respects that there are so many inducements to modern amateur photographers to attempt the acquirement of a sound photographic judgment by other methods than that of simple experience. Let me cite, in point, those so-called aids to exposure: actinographs, actinometers, and exposure-meters, as calculated rather to prevent the cultivation of individual judgment than to foster it. You must remember that professional portraitists and landscape-workers, and the old-style amateurs, of whom I have already spoken, relied upon experience alone to guide them in their exposures. My own belief is that a man who takes up photography will surmount the difficulties of exposure by the aid of his own brains, or not at all. If he has not brains enough for that, then he is equally incapacitated for mastering the philosophy of exposure-calculators. I am about to examine some of the principles upon which actinometrical or actinographical systems are based, and possibly to draw some conclusions not entirely favourable to them; but, before doing so, there is one exposure-meter which I must exempt from objection. Indeed, I recommend it to each and every one of you. It is, I think, the cheapest and most efficient on the market, does not get out of order, if destroyed may be easily replaced, requires no arithmetical calculations to use, and and may be had of all dealers. It has been testimonialised by the most successful photographers throughout the world, and, when once its application is mastered, it seldom leads you astray. With it all the best photographs have been taken, and thus, in regard to medals, it, as our friends at Ilford would say, has secured more than all the rest. It is an exposure-meter which enables the photographer with brains enough to use it to get twelve good negatives from a dozen plates. No photographer should be without it, and no photographer is. Need I say, gentlemen, that I allude to the focussing screen of the camera? It is by the study of the image on the screen, it is by comparing the depth of the shadows, the strength of the half-tones, the brilliancy of the high lights, with those of other pictures taken under similar circumstances; it is by studying the visible influence of the lens diaphragms on the brightness of the image; in short, by comparing the exposure about to be given with that previously given under similar or different conditions, as the case may be, that experience was gained in former times. It is theoretically a very unscientific method, of course, but you all know how well it has answered practically. Occasionally it fails; but can you conceive of an infallible actinograph? Besides,

it is good that it should fail at times for what an education in development under and over-exposure provides for the painstaking photographer who is willing, as he should be, to learn from his failures! You may say to me that these last advantages also accrue to the employment of an exposure-meter or an actinograph? Granted; but, in that case, why use an exposure-meter or an actinograph? An instrument or system of this nature, plus an unerring judgment of those factors in exposure compulsorily left to the estimation of the individual, and which is fallible, seems to me not to possess any point of superiority to the unaided fallible judgment alone. I shall endeavour to show that the probabilities of any instrument or system for indicating correct exposure can scarcely be other than incorrect, to the contrary of which there are practical objections which science is, I believe, powerless to overcome.

No Exposure Factors "Constant."

Mr. Howard Farmer recently pointed out that several important factors are not taken account of in certain systems of calculating exposures; but, even if the omitted factors—such, for example, as colour and distance of object—were included, I still submit that theoretical or practical accuracy could not possibly be assured. To the inexperienced or the beginner in photography, for whom, bear in mind, all these aids or guides to exposure are intended, the difficulty of estimating, or, rather, of judging the actinic value of the light on any day or at any hour is no inconsiderable one, especially if you reflect that even a photographer of ripe and lengthy experience is occasionally mistaken in his judgment. I have seen it stated that of the three principal factors involved, viz., the light, the speed of the plate, and the aperture of the lens, the two latter are constant. But the ascertained comparative or particular speed of a plate so soon as it leaves the manufacturer's drying-room does not appear to be above suspicion of change. Quite recently, Dr. Vogel, of Berlin, gave instances where commercial plates materially increased in sensitiveness after a month or two's keeping, and the same phenomenon has been claimed to have been observed by several other workers during the last few years. On the other hand, some photographers have concluded from the results of experience that sensitiveness diminishes by keeping. If either of these two theories is correct, the speed of a plate, no matter how it is ascertained, cannot be reasonably accepted as a constant factor in exposure calculations. Again, the argument, in reference to the aperture of the lens, that all lenses are of equal rapidity with a given stop, assumes two conditions which are far from being always realised, namely, that the diameters of the stop openings are accurately expressed in relation to focus, and that all lenses are on an equality as to the amount of light they pass. Optical glass, however, is, I believe, of somewhat varying quality as regards colouration, experiment having proved that even in modern lenses as much as twenty-five per cent. of the light is occasionally obstructed by the colouration of the glass as compared with the glass employed in other objectives. One can easily understand that time superinduces changes in the glass of lenses as well as in the material with which they are cemented so as materially to slow them. Can it, then, be fairly claimed that all or either of the three factors I have referred to are to be accepted as constants in basing calculations upon them? If so, in what manner will you dispense with individual judgment if you admit, as you must, the no less important factors of colour and distance of objects to your calculations? I put it, that constancy of any of the factors in exposure calculations is far from being the certainty we are asked to believe.

"Formulæ."

That exposures calculated according to the systems we are now discussing are sometimes correct, I do not deny; it would be strange were it not so. But an exception does not negative a principle, and it is a principle I am urging, namely, that of buying photographic wisdom by photographic experience. The world's photography has so far been accomplished by the aid of the actinometrical readings of the focussing screen; why, then, should the beginner or student expect to extract from mere empiricism the knowledge which has been shown to result from the reliable, although "unscientific," method of trial and error? The plethora of new developers, the legion of hand cameras and rapid shutters, the numerous exposure systems seem to me to be the articulate expression of a wish to compress photograph-taking into a rule-of-three sum, and so to enable one to run without the necessity of having to learn to walk. Do not understand me as advocating rule of thumb; I am merely advocating the exercise of the individual intelligence as opposed to falsely inspired formulæ. The word "formulæ" here induces me to recommend to you a source of instruction as to the wide range in the differences of opinion which prevail among dry-plate makers and dry-plate users in respect of the proportional constitution of developing formulæ. Make a collection of such formulæ from representative sources, and convert them either into parts per thousand or grains and minims per ounce, and you will assuredly have a most bewildering statement of proportions of accelerator to reducer, and of restrainer to both, together with a lengthy list of ingredients which appear in some formulæ and not in others, and the exact functions of which many people would find it difficult to define. In the normal developer for A's plates, for example, you may see one and a half grains of pyro, eight of sulphite, and ten of sodium carbonate to the ounce; in B's developer the quantities doubled; in C's one constituent quadrupled and another halved, while in D's the inter-proportions suggest nothing so much as the constituents having been selected purely by hap-hazard. The curious part of the matter is, that in all probability A's developer will develope C's plate perfectly, and D's B's, and so on; in short, each or any one of the many developers you analyse, although specifically recommended for one brand of plates, will develop any other brand equally well. So much the better for the users of gelatine plates, you will say, and I endorse the sentiment, but do not overlook the obvious point, and that is, that after all the years during which "scientific development" has been preached, practically the old rule of thumb still survives, and that, on the whole, photography is little the worse for it.

"Photography Made Easy."

The commercially created and fostered tendency among amateur workers to substitute for the mellow judgment of experience and unwearying practice the ephemeral wisdom of the many aids to easy photography which shrewd men of business are always anxious to supply on demand, tends, in my humble opinion, to undermine those valuable characteristics of practice, patience, application, self-reliance, and perseverance which have hitherto been recognised as essential to the making of the successful photographer, amateur or professional. Frankly speaking, I look upon it as one of the causes to which we may refer the admittedly low average of quality of modern amateur work. The best amateur work of to-day is undoubtedly as good as, and possibly better, than the work of ten or twelve years ago; but the average strikes me as lower, an opinion which I base on a comparison of the work shown on the walls of exhibitions during that time. Probably the seductive simplicity of the hand camera and the fascinating facility of shutter work have also operated in the same direction.

In conclusion, I renew the plea I have already entered for technical excellence of photographic work, for technical skill in producing it, for technical instinct in appraising it. But that excellence, that skill, and that instinct can only be reached by assiduous cultivation. Believe me, while there are many persons to whom a photograph is only admissible when it appeals to their æsthetic emotions, there are probably a far larger number who, while ready to welcome the artistic effects produced by "diffusion of focus" and low-keyed tones on rough surfaces, have a higher appreciation of the technical qualities previously referred to. Whether or not the cause of technical photographic excellence and progress is likely to be promoted by the attempts now being made to convert photography into an involved arithmetical exercise, and, in fine, what the tendencies of that movement are, is a point for discussion that I have endeavoured to lay bare to you in the course of a series of intangible generalisations and impressionistic reflections which, I hope, while blunting the edges of your critical dissecting knives, have not wholly undeserved the attention you have been so good as to bestow upon them.

Thomas Bedding.

THE NEW CONCENTRIC LENS.

(Photographic Society of Great Britain.)

The following is the paper by Messrs. Ross & Co., read at the meeting of the above Society on May 24:—

The construction of a lens to give a "positive" focus, or that caused by rays of convergence, has hitherto been obtained by the radius of convexity of one refracting surface being shorter than the concave one. As an illustration of this, take a simple lens of the form shown in the diagram (Fig. 1, *a*, or as achromatised in *b*). If the meniscus form of this were to be altered by making the concave surface deeper, as in *c*, the lens would have no convergent focus at all, the rays would become divergent, and the result would be negative. Supposing this lens to be a compound, made up of crown and flint glass, the latter having the greater refractive power, it will still be observed that the sum of all the positive curves is deeper than the sum of the negative radii. This form of construction is reversed in the Concentric, in which lens the convex surface has a longer radius than the concave, as in *c* above, the diagram of which

would at first sight lead one to expect a negative focus without any image; but this is not the case, for, by the selection of a suitable crown glass for the positive element of higher refraction than the flint of the negative element, the rays are caused to converge, and, by the special effect of refraction on the oblique pencils, the lens, although of this peculiar form, gives a real image, free from distortion, on an abso-

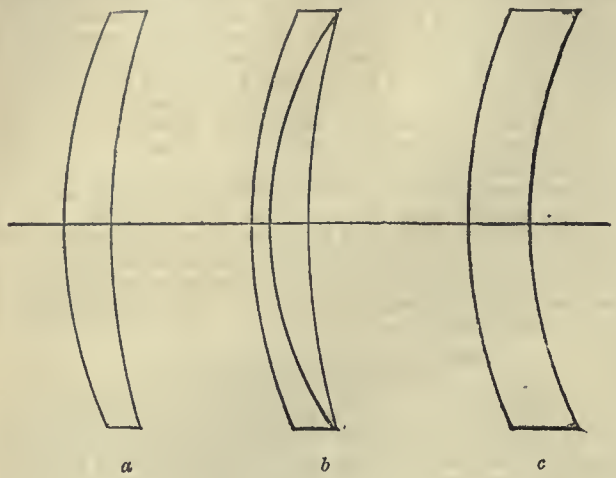


Fig. 1.

lutely flat field, extending over a circle of about 75°, the margin being as sharply defined as the centre; and, moreover, the whole is practically as equally illuminated as the theoretical limits will permit.

Every simple lens is represented by a system of prisms, whose angles are formed by the tangents of the radii. If two prisms or lenses are cemented together to form an achromatic prism or lens, the angles of the two components are in a certain relative proportion, determined by the ratio of refraction and dispersion of the glass employed. When rays pass through such a lens, achromatic both at centre and margin, these angles may then be greater, yet the relative ratio of both must be the same as those at the centre, for, if they differ in ratio, the marginal pencils will not be achromatic, and will be deviated in undue proportion, and, besides colour, will cause optical distortion. Taking an ordinary compound meniscus lens, whose curves are represented in the diagram (Fig. 2), we find that the tangents of the three curves are parallel at the centre, so that

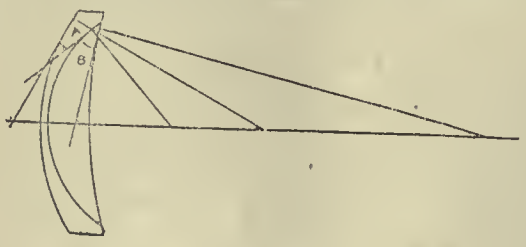


Fig. 2.

there is no distortion or deviation of the direct incident pencils; but, as we leave the centre, we find that the tangents of the first and second curves approach one another, forming a wedge or prism, and the tangents of the second and third curves form a similar prism of smaller angle and in the reverse direction. This implies a greater power of the crown lens at the margin; and, as this has positive aberration, the image produced by the margin of the achromat must be smaller than the central image, and hence barrel-shaped distortion and coloured fringes are produced. In the other diagrams (Fig. 3) representing the "Concentric" lens, it is evident, on consideration, that, on account of concentricity, the two tangents, which, with the central plane, form the prisms, are always parallel, and the angles formed in constant ratio. Such an achromat will therefore produce neither general distortion nor distortion of the coloured images.

The field of the Concentric lens is practically illuminated equally all over. In all lenses the diaphragm reduces the amount of light in proportion to the deviation of the oblique cone of rays from the central cone (Fig. 4). This diminution of light towards the margin of the field is small, however, when compared to that due to astigmatism and longitudinal spherical aberration in all ordinary lenses. The elliptical appearance of the diaphragm, caused by the oblique direction in which it is viewed, is exaggerated by the distortion in ordinary lenses, which have the property of diminishing objects in the horizontal diameter, whereas in the "concentric" lens the diaphragm retains its circular shape until the light has nearly vanished. This is the effect of the opposite refraction, due to the negative meniscus form having a positive focus, and which tends to open out—so to speak—the diaphragm to its normal circular form. An ordinary lens, bringing its central rays to a sharp focus, may be so constructed as to do so

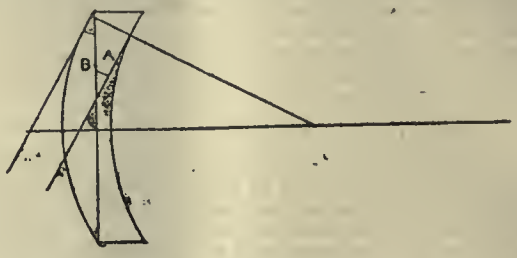


Fig. 3.

marginally also, but only on a curved field, a flat field being alone obtainable with such a lens by the undue lengthening of the marginal pencils, resulting in astigmatism at the expense of definition. The rays do not actually meet in one point, so that the major portions are lost, or worse, as they only assist to obliterate the sharpness of the actual working rays. In the "Concentric," however, the whole pencil of rays go to form the image equally at the margin as at the centre.

Theoretically, a lens has no depth of focus; or, to speak more correctly, no depth of definition, for, optically, focus is a point. At the focal point the sharpest definition is obtained; but on each side there is a certain amount until the aberration becomes so great as to be perceptible. Ordinary lenses, which come to focus sharp only in the centre of the field, with vanishing distinctness towards the margin, are said to possess a certain depth of definition; but this is alone true for the centre, the remainder of the field being only a compromise for definition at all. In the "Concentric," however, we start with sharp and equal definition all over the field, due to its novel system of construction, and thus the definition of all objects situated equidistant from the principal focussed object is equalised. Also, as there is no distortion or deviation of any point of the cone of rays, they may be said to cling closer together for a longer distance on each side of the point of true focus. The "Concentric," therefore, more nearly yields the theoretical amount of depth of definition (regulated more or less by aperture) than any other lens, and consequently may be said to possess greater depth of focus or definition over the entire field.

In practice it is found that the "Concentric" lens is considerably more rapid than other lenses of equal aperture and focus. By referring back to the diagram (Fig. 2) shown to illustrate the loss of rays from spherical aberration and distortion, it is apparent that the

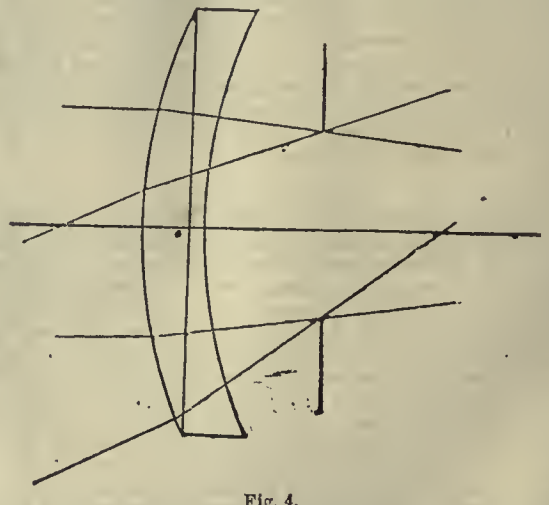


Fig. 4.

whole cone being brought to a focus in the "Concentric" without distortion the "Concentric" consequently works quicker than lenses in which a portion of the rays only is used, and where the non-focussing merely interfere by throwing useless light into the shadows.

Having now drawn attention to some of the chief differences between the "Concentric" and other lenses, it will be desirable, before

proceeding, to examine and compare these lenses optically, to explain the principle upon which the testing apparatus is constructed. We use a stand to carry a photographic lens in direct line between a

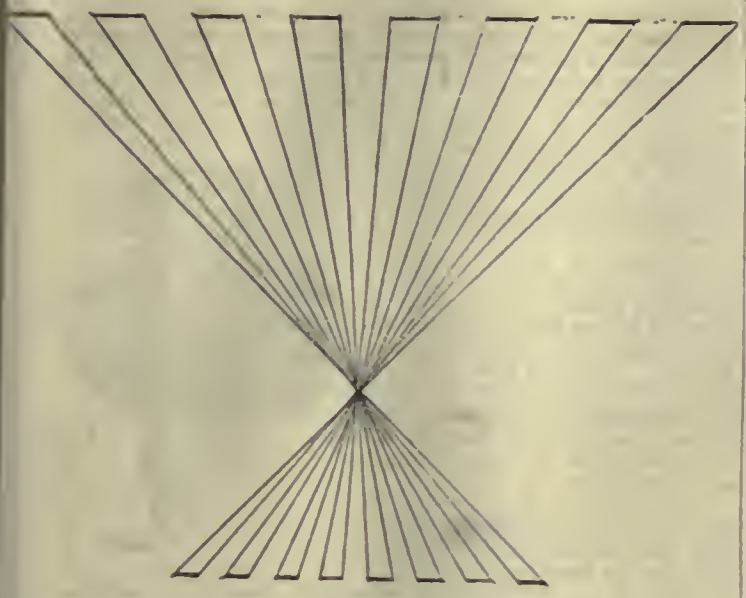


Fig. 5.

stationary lamp and a concentric aplanatic magnifier; the adjustments attached are to alter the distances between the positions for convenience of focussing. Having by this means examined the central

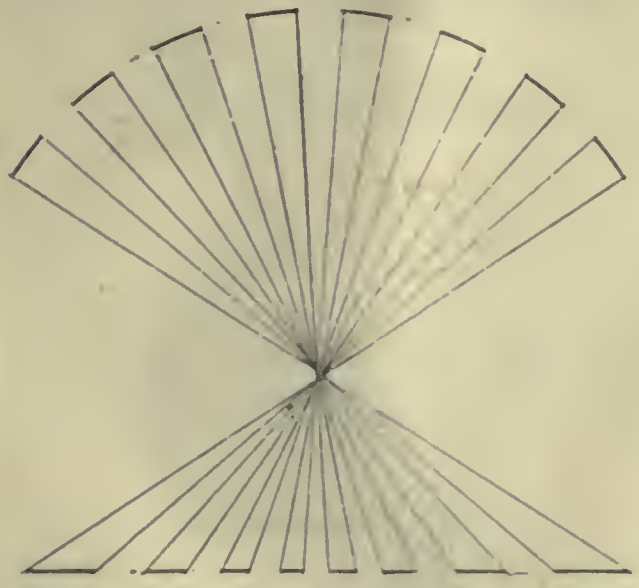


Fig. 6.

pencil, the magnifier at the back is moved aside in a line towards the margin of the field, and a movable lamp placed at a distance is traversed on a plane, parallel and at the same level as that in which the magnifier is moved, and which corresponds to the surface of the ground glass of a camera; the magnifier is moved sideways until the lamp and attached dial are visible, the angle subtended then being equal to that of the opposite side. This represents the view angle, or, as the case may be, the diagonal of covering at that particular angle. The two diagrams herewith (Figs. 5 and 6) represent the principle upon which this method of testing is based, and it will be found that all that has been stated in connexion with the "Concentric" lens is optically correct, both when taken by itself and in comparison with other lenses. It should be mentioned that, the magnifier being of the form of a sphere with concentric surfaces, the focal distance from the centre is the same at all angles of obliquity, so that it requires no axial adjustment to meet the line of an oblique ray.

DISRUPTION OF THE SILVER HALOID MOLECULE BY MECHANICAL FORCE.

[Philosophical Magazine.]

In a paper published about a year ago on the subject of Allotropic Silver, there was included an investigation into the action of the different forms of energy upon silver chloride and bromide.* It was there shown that these substances possessed an equilibrium so singularly balanced as to be affected by the slightest action of any form of energy. Such action produced a change which, though it might be wholly invisible, yet caused the breaking up of the haloid when subsequently placed in contact with a reducing agent. The forms of energy with which this effect was observed are—

1st. Heat.

2nd. Light.

3rd. Mechanical force.

4th. Electricity (high tension spark).

5th. Chemism.

It follows, therefore, that it is not light only that is capable of producing an invisible image, *but that this power belongs alike to all forms of energy*. So that a slight impulse from any one of the forces just mentioned brings about a change in the equilibrium of such a nature that the molecule is more easily broken up by a reducing agent.

As respects four out of these five forms of energy, it was further shown that when made to act more strongly, they were able of themselves to disrupt the molecule without external aid. One form alone of energy, mechanical force, made an apparent exception to this general rule. The other four, when applied to a moderate extent, produced a latent image; applied more strongly, they broke up the molecule.

The object of the present paper is to prove that this exception does not exist, and that as all forms of energy have been shown in the previous papers of this series to be capable of impressing an invisible image, so also with stronger manifestations, *any form of energy is capable of disrupting the molecule*.

I was able to show many years ago that mechanical force could produce a latent image. Lines drawn with a glass rod on a sensitive surface could be rendered visible by development in the same way as impressions of light. An embossed card pressed on a sensitive film left an invisible image, which could be brought out by a reducing agent. The raised portions of the embossed work exerted a stronger pressure on the sensitive film than the rest of the card, and these portions darkened when acted upon by a reducing agent. In the same way, the lines traced with a glass rod blackened under a developer. In each case, it was the portions which had been subjected to pressure which yielded first to the reducer. It was therefore clear that in the molecules which had received this slight pressure the affinities of the atoms had been loosened.

To bring these phenomena fully into line with the others, it is now necessary to prove that an increased pressure can take the place of a reducing agent, and disrupt the molecule. And this is actually the case.

It was found that the breaking up could be produced in two ways—by simple pressure and by shearing stress. Silver chloride and bromide formed and washed in absence of active light were subjected to these agencies.

1. Simple Pressure.

In the first trial made with silver chloride it was enclosed in asbestos paper, which had been first ignited with a blast lamp to remove all traces of organic matter present. This method was tried in order that the chloride should be in contact with perfectly inactive material only, but it was not found to answer. The great pressure

* *Philosophical Magazine*, April 1891, p. 320.

employed forced the dry chloride into the pores of the paper, cementing it together, so that the opposite sides could not be separated. Platinum foil was then substituted with satisfactory results. With a pressure of about one hundred thousand pounds to the square inch, maintained for twenty-four hours, the chloride was completely blackened, except at the edges, where, owing to greater thinness, the pressure was less. Very bright foil was used in order to detect the slightest discolouration that might occur, but none resulted: it was impossible to distinguish the portions which had been in contact with the darkened chloride from those that had not. The chloride did not assume the usual chocolate colour, but changed to a deep greenish black.

Silver bromide gave exactly the same results. It should be mentioned that the silver chloride and bromide were each precipitated with an excess of the corresponding acid.

As silver iodide precipitated with excess of potassium iodide is not darkened by light it seemed improbable that it should be by pressure. The experiment was, however, tried, and it was found that the iodide darkened fully to the same extent as the others. This result surprised me so much that the experiment was repeated with every possible precaution. The result left no doubt that silver iodide, as well as the chloride and bromide, is blackened by great pressure. All three silver haloids take on the same colouration—an intense greenish black. It was found best to use the material air-dried. If at all moist, the platinum foil bursts under the pressure and the experiment is invalidated. The air-dried salt retains a sufficient quantity of moisture.

2. Shearing Stress.

As a means of applying this form of force, the silver chloride, precipitated with excess of hydrochloric acid and well washed, was put into a porcelain mortar and well triturated. The improbability that the small quantity of force that can be applied in this way would break up a stable molecule like that of silver chloride seemed so great, that at first a substance tending to aid the reaction was added. Tannin was selected, and when forcibly ground up with silver chloride the latter was soon darkened. Next a substance capable of taking up acid, but having no reducing action, was tried. Sodium carbonate was used. This also caused the chloride to darken. Finally, it was determined to ascertain if the molecule of silver chloride could not be disrupted by stress alone. The chloride was placed in a chemically clean porcelain mortar and well triturated. For some time no effect was visible. After about ten minutes' action dark streaks began to appear, and after five minutes' more work a considerable portion of the chloride was darkened. The end of the pestle was covered with a shining purple varnish. It had not become perceptibly warmer to the touch. On the violet-purple substance nitric acid had no action, but aqua regia slowly whitened it. It was therefore what I have proposed to call silver photochloride, that is, a molecular combination of chloride and hemichloride. This experiment was carefully repeated with the same result. Silver bromide similarly treated gave a similar result. It was noticed that both chloride and bromide, in darkening, took on the familiar colour between chocolate and purple, so generally seen in the darkening of these silver salts, and differing strikingly from the greenish-black colour assumed by all three silver haloids under simple pressure.

The fact that the platinum foil remained absolutely unattacked when the silver haloid was reduced by simple pressure in actual contact with it is interesting, and would seem to show that in the reduction of the silver haloid the halogen is not at any time set free; but that water, if present, is decomposed at the same moment, with formation of halogen acid.

The observations recorded in this paper prove the existence of a perfect uniformity in the action of all kinds of energy on the silver haloids. The balance of the molecule is at once affected by the action of any form of energy. A slight application produces an effect which, though invisible to the eye, is instantly made evident by the application of a reducing agent. The bonds which unite the atoms have evidently been in some way loosened, so that these molecules break up more easily than those to which energy has not been applied. Consequently, if the substance is submitted to the action of light, heat, or electricity, or if lines are drawn by a glass rod (shearing stress), or with sulphuric acid (chemism), a reducing agent blackens the parts so treated before it affects the parts not so treated. This justifies the statement made earlier in this paper, that the phenomena of the latent image and of its development are not exclusively, or even especially, connected with light, as hitherto supposed, but belong to all other forms of energy as well.

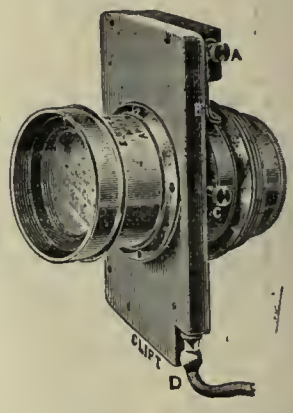
M. Carey Lea.

(To be concluded.)

Our Editorial Table.

Le Constant.

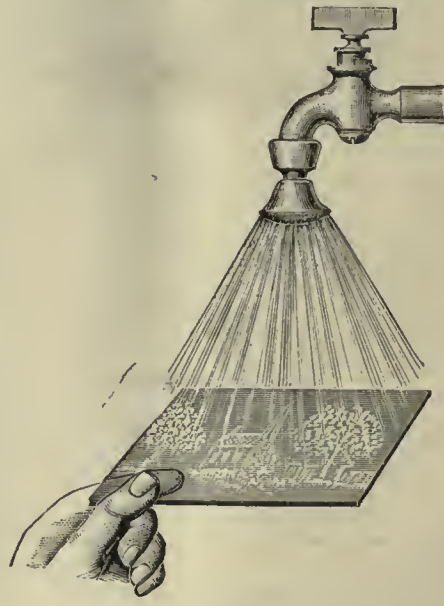
This is the name given to a shutter, or, to be more explicit, a series of shutters, of the "always ready," or automatic class, for which Mr. J. R. Gotz, 19, Buckingham-street, Strand, W.C., is agent. One of these, now before us, is arranged for the stereoscopic camera, and fits on the hoods of the lenses, being firmly fixed thereto by thumbscrews. When set for instantaneous exposures, pressure on the pneumatic ball suffices to discharge it, and, as no setting is required, this may be made to go on interminably. By setting a lever, the action is brought under the direct control of the ball, upon pressure of which the shutter flies open, and remains so until the pressure is relaxed. By pushing in a button at one end, the shutter remains open permanently to permit of focussing. This is a most delightful shutter. We exposed several dozen stereoscopic plates by its agency during the late Convention in Scotland, and the certainty of its action charmed every one who saw it.



Another of the same class of shutters, or another application of the principle, is that shown in the cut. Whereas the former one is fitted on the front of the lens, this goes between the lenses of the combination, which is undoubtedly the best position. The parts indicated by letters show respectively the manipulatory points at which time and instantaneous exposure, speed regulator, operating an iris, or inserting a Waterhouse diaphragm, and attaching the pneumatic tube are effected. The workmanship is admirable.

Tylar's Tap-sprinklers.

Mr. William Tylar has sent us specimens of two styles of tap-sprinklers which he has just brought out. While they slightly differ



as regards form, both are equally effective in action. They fit easily on ordinary taps, and their nature and use will be ascertained from the diagram.

Photographic Reproduction Processes.

By P. C. Duchochois.

London: Hampton Judd, & Co., 13, Carsitor-street.

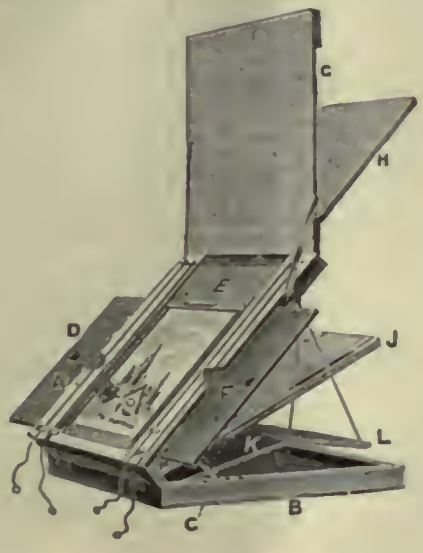
In this work the author treats very fully and clearly of most printing processes, ancient and modern, other than those in which the salts of silver form the sensitive layer. Iron and uranium

printing methods find a prominent place, and many other little known processes are dealt with, which should make the book useful for reference to those who desire a collected account of the results of the experiments of Hunt, Herschell, Burnett, and many others who in former times devoted a large share of their labours to the invention of printing processes, some of which, although lost sight of at the present moment, are probably destined to be resuscitated. The book is well bound and printed.

The Photo-Chromoscope.

This ingenious invention has been placed on the market by Messrs. G. Houghton & Son, of High Holborn. It was shown at the Edinburgh Convention. By its aid transparent photographs can be transformed into realistic pictures, perfect in detail, in perspective, in light and shade, and in general tints, and susceptible of a variety of natural and pleasing changes of effects.

The apparatus should be arranged in the first place as shown (opened) in the cut, the back exposed to a fairly strong light—a window during the day, or a lamp adjustable to any required position at night; the photograph to be exhibited being placed in the glazed frame A, and (if necessary to keep it flat) covered by a pane of glass, and the sliding panels, D, E, F, being adjusted so as to exclude the light from all that portion of the frame not occupied by the picture.



The light being thus excluded from the surroundings of the semi-transparent photograph at the front, and thrown upon it strongly at the back, many of the details which are ordinarily indistinct are clearly brought out.

By various adjustments of the parts of the apparatus it is available for the exhibition of landscapes, portraits, and statuary, a great variety of effects being obtained by the depression or elevation of the shade H, the sky frame J, or the reflectors K, L, as well as coloured slips placed at L alone. Messrs. Houghton supply a full descriptive pamphlet.

RECENT PATENTS.

APPLICATION FOR PATENT.

No. 13,241.—"A New or Improved Plate Screen for Photographic Cameras." T. G. Hembry.—*Dated July* 19, 1892.

SPECIFICATION PUBLISHED.

1891.

No. 11,265.—"Employing Materials Sensitive to Radiant Energy." Thomas.

PATENTS COMPLETED.

An Improved Rocking Apparatus for Photographic and other Purposes.

No. 14,286. George Francis Pittar, 48, Hungerford-road, N., Middlesex, and Ernest Thompson, 10, Marlborough-road, Lee, Kent.—*June* 25, 1892.

This invention has for its object the construction of a series of troughs, sinks, and connexions, to be actuated by the flow of water or other liquid, for rocking or washing photographic plates or prints. Also for combining the processes of developing or washing with rocking. Also for obtaining a rocking motion for any other purpose.

It consists of the following parts:—

1st. A double-ended trough, with ends inclined outwards, having a cross partition in the centre. This trough is arranged on trunnions, having a crank attached to one trunnion for the purpose of actuating the rocking tray.

2nd. A rocking tray, consisting of a flat sheet of metal, with projections to support object to be rocked or washed. This tray is balanced on pivots, and connected to the trunnion crank by a rod.

3rd. An inlet pipe, arranged over the central partition of rocking trough in such a manner that the water or other liquid can flow on to one side of partition. This fills one side of trough, and causes it to drop and empty into the sink underneath, at the same time raising the other end of trough. From this sink the liquid may be allowed, if necessary, to run over the object to be rocked or washed, which is placed on the rocking tray. The pipe now fills the other end of trough, and causes it to drop and empty, thus producing a rocking motion, and ensuring a continual movement of the object operated on, and also bringing fresh liquid in contact with it. The liquid, by actuating the rocker thus, may serve two purposes.

The rocking tray is arranged in a suitable sink with outlet.

The greater part of this apparatus is preferably made of tinplate, and will be exceedingly cheap to manufacture.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—1. The combination with a platform mounted upon pivots or trunnions of a double-ended trough also mounted upon pivots or trunnions and connected with the said pivoted platform in such a manner that, when the said double-ended trough is caused to oscillate by alternately filling the ends with water and emptying the same, the said platform will also be caused to oscillate, substantially in the manner described. 2. In a rocking apparatus provided with a double-ended oscillating trough as described in the preceding claiming clause, providing the said double-ended trough with a central partition for alternately directing the water into the opposite ends thereof, substantially as described. 3. The manufacture and use of the improved rocking apparatus hereinbefore described and illustrated in the accompanying drawings, and operated as and for the purposes set forth.

Improvements in Photographic Apparatus.

No. 14,336. Charles Walker Clarke, 32 Market-place, Devizes, Wilts.—*June* 25, 1892.

This my invention relates to certain improvements in or relating to photographic apparatus, and consists of a shade for cutting off or screening a part of the light from certain parts of a view during exposure in the camera, such as the sky in a landscape, or windows in the case of an interior.

This screen may be of any suitable material, but I prefer to use either celluloid, or glass stained or tinted in places, but graduated off to an absolute transparency.

For taking a landscape photograph, I should generally use a screen in such a position that it would cover the sky as seen through the ground glass, and should set it in such a position that the transparent edge of the screen just clears the horizon in the view (this I should regulate by a graduated scale attached to the screen, and a corresponding scale attached to the ground glass).

I find that, by this means, I am enabled to obtain a negative of much more uniform density, and to obtain pictures of clouds which, without the use of the screen, would not appear at all.

The screen may be used in any convenient position, either in front, between or behind the lenses, but I find it convenient to make the screens to slide in a slot in the same manner as a Waterhouse diaphragm; but sometimes I use either a circular screen to revolve, a square screen to let down from the top, or to be pushed through the side, inside the camera, with suitable arrangements for manipulating the same from the outside. This screen is formed either in different shapes, or with tints of different depths, or with different patterns (preferably round its circumference), and is arranged in such a manner that more or less of either tint, or pattern, or screen, may be brought into the view as required.

To screen a window in the case of an interior exposure, I should select a screen having one or more suitably stained and graduated spots, which I should arrange in such a position that it would shield or screen off the bright rays as seen through the ground glass of the camera.

It will be understood that the object of this invention is to reduce the greater illumination proceeding from certain parts of the subject, such as the sky or a window, leaving the darker portions unscreened.

The device may be either combined with the camera, the lens, or the shutter, or, if desired, it may be a separate or independent attachment.

It may sometimes be desirable to use two or more screens for different parts of a subject.

If desired, the screen may consist of a cloud scene, made by photographic or by any other means, and used preferably inside the camera, so that by this arrangement clouds may be included in a negative, even when the sky is clear, or any other device by the same means may be formed on the screen for insertion in the negative.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—1. The combination with an apparatus for exposing a photographic plate or film of a semi-transparent or tinted screen so arranged that it only covers a part of the view, and is brought into position after the view or a portion of the view has had a short but complete exposure substantially as described. 2. The combination with an apparatus for exposing a photographic plate or film of a semi-transparent or tinted screen which only covers a part of the view, so arranged that it can be partially or wholly removed, giving a short but complete exposure to a part or the whole of the screened portion of the view before the shutter is closed substantially as described. 3. The combination with an apparatus for exposing a photographic plate or film of a semi-transparent or tinted screen which only covers a part of the view, so arranged

and operated that a short but complete exposure is given to a part or the whole of the screened portion of the view, both before and after the screen is brought into operation substantially as described. 4. The combination with an apparatus for exposing a photographic plate or film of a semi-transparent or tinted screen so arranged that it only covers a part of the view, and is graduated off to an absolute transparency at one or more of its edges, and so arranged that it reduces the amount of light which reaches a portion of the photographic plate or film substantially as described. 5. The combination with a photographic lens of a semi-transparent or tinted screen which only covers a part of the view, and which is graduated off to an absolute transparency at one or more of its edges, and so constructed that it may be inserted and used in the diaphragm slot together with, or instead of the stop, substantially as described. 6. The combination with a photographic lens of a semi-transparent or tinted screen which only covers a part of the view, the form of which is capable of being cut or altered to suit the subject intended to be taken on the photographic plate or film substantially as described. 7. The combination with an apparatus for exposing a photographic plate or film of a frame, arranged to hold a semi-transparent or tinted screen, and which slides in a slot, and is connected with the top of the rod by which the flap is worked, substantially as and for the purpose described and illustrated in the accompanying drawings. 8. The combination of a semi-transparent or tinted screen, with a frame, arranged to be brought into operation by the movement of a shutter, substantially as described and illustrated in the accompanying drawings. 9. The combination with an apparatus for exposing a photographic plate or film of a semi-transparent or tinted screen which only covers a part of the view, and which is graduated off to an absolute transparency at one or more of its edges, and has one or more of its edges straight or curved, and is supported in front or behind the lens in such a manner that it reduces the light which reaches certain portions of the photographic plate or film, substantially as described. 10. The combination with an apparatus for exposing a photographic plate or film of two or more semi-transparent or tinted screens which will only cover part of the view, and which are graduated off to an absolute transparency at one or more of their edges, and have one or more of their edges formed either straight or curved, and which are so arranged that they obstruct or reduce the light which reaches certain portions of the sensitive plate or film. 11. The combination of a photographic camera with a semi-transparent or tinted screen which only covers a part of the view, and which is graduated off to an absolute transparency at one or more of its edges (which, if desired, may be curved), and which is arranged behind the lens and inside the camera in such a manner that it screens or reduces the light which reaches certain portions of the photographic plate or film, and that it may be adjusted from the outside, and operated either by the action of the shutter or independently, substantially as described. 12. The combination with an apparatus for exposing a photographic plate or film of a transparent screen having more or less, but not the whole, of its surface stained or tinted in such a manner that it obstructs or reduces the light which reaches the sensitive surface from the lighter part or parts of a view, substantially as and for the purpose described. 13. The combination with an apparatus for exposing a photographic plate or film of a transparent screen, which is stained or tinted more at certain parts than others in order to reduce or qualify the light which reaches the sensitive surface, substantially as and for the purpose described.

A New or Improved Focussing Device or Cloth for use in Photography and the Like.

No. 18,702. Ann Van der Werff, 37, Dockwray-square, North Shields, Northumberland.—*June* 25, 1892.

This invention relates to a new or improved focussing cloth or mask for the use of photographers and for like purposes.

In carrying this invention into practical effect, I provide a mask so constructed as to closely fit over the eyes of the operator, and formed with an opening or openings through which he may view the focussing screen. One end of the focussing cloth is secured round, or partially round, the edges of the mask, which may be provided with a handle with which it may be held in position before the operator's eyes.

In a modified arrangement the mask may be held in position by an elastic or other band passing round the operator's head or ears. The said mask may, or may not, be provided with a magnifying lens or lenses, arranged in the openings through which the operator looks, in order that the image on the focussing screen may be closely examined.

In a further modification, I form one end of an ordinary focussing cloth as a mask, or partial mask, to fit over the operator's eyes, and strengthen the said mask by forming it upon a frame of wire or other suitable material.

It will be readily seen that this combined focussing cloth and mask does not obstruct the breathing, and is specially adapted for use in the open air, as the wind cannot blow it up from around the operator's head, as is so frequently the case with the ordinary cloth.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—A new or improved focussing device for use in photography and the like, consisting of a focussing cloth, formed at one end as, or attached to, a mask, or partial mask, to fit over the operator's eyes, substantially as and for the purpose hereinbefore described and set forth and illustrated in the accompanying drawings.

Improvements in Supports for Photographic Cameras.

No. 11,372. George Mason, 180, Sauchiehall-street, Glasgow, Lanarkshire, N. B., and Alexander Lamont Henderson, 277, Lewisham High-road, St. John's, Kent.—*July* 2, 1892.

This invention relates to photographic camera supports of the tripod or jointed-leg class, and has for its object to provide improved adjustable mechanism for fixing the legs rigidly in a required position, so that they will not tend to spread or otherwise move in a manner to alter the position of the camera.

The improved mechanism consists, in the case of a tripod stand, of three steadying bars, with a clamping screw or screw box for fixing them together centrally, with the bars radiating from the centre to a greater or less extent as required in each case. The outer ends of the bars are fitted with parts for easy attachment to the tripod legs. In the case of a common construction of tripod stand, in which each leg is locked upon the pins in the top frame on which the leg is hinged by a strut or turn-down pin which distends the sides of the leg, the ends of the steadying bars may be arranged to engage with the said struts, or the struts may be formed on the ends of the steadying bars. Any other convenient means for connecting the steadying bars to the tripod legs may be used. The steadying bars may be slotted longitudinally, the clamping screw passing through the slots and the bars being pinched between the head of the screw and a nut; or the steadying bars may be unslotted and be passed through slots in a small box, a screw screwed into one end of the box serving to fix them.

When an operator is adjusting his camera the clamping or fixing screw will be loose, and the adjusting bars free to move with the legs, and, on obtaining the adjustment, he will simply have to turn the screw until tight.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
August 1	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 1	Halifax Camera Club	
,, 1	Peterborough	Museum, Minster Precincts.
,, 1	South London	Hanover Hall, Hanover-park, S.E.
,, 1	Stereoscopic Club	Brooklands Hotel, Brooklands.
,, 2	Exeter	College Hall, South-street, Exeter.
,, 2	Glossop Dale	Rooms, Howard-chambers, Glossop.
,, 2	Herefordshire	Mansion House, Hereford.
,, 2	Lewes	Fitzroy Library, High-st., Lewes.
,, 2	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 2	Rotherham	
,, 2	Sheffield Photo. Society	Masonic Hall, Surrey-street.
,, 2	York	Victoria Hall, York.
,, 3	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 3	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 3	Putney	High-street, Putney.
,, 3	Southsea	
,, 3	Wallasey	Egremont Institute, Egremont.
,, 3	West Surrey	St. Mark's Schools, Battersea-rise.
,, 4	Brixton and Clapham	Gresham Hall, Brixton.
,, 4	Leeds Photo. Society	Mechanics' Institute, Leeds.
,, 4	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 4	Oldham	The Lyceum, Union-street, Oldham.
,, 4	Tunbridge Wells	Mechanics' Inst., Tunbridge Wells.
,, 5	Bristol and West of England	Rooms, 28, Berkeley-sq, Bristol.
,, 5	Cardiff	
,, 5	Croydon Microscopical	Public Hall, George-street, Croydon
,, 5	Holborn	
,, 5	Leamington	Trinity Church Room, Morton-st.
,, 5	Maidstone	"The Palace," Maidstone.
,, 5	Richmond	Greyhound Hotel, Richmond.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

July 26,—Technical Meeting, Mr. Alexander Mackie in the chair.

Modern Developers.

Mr. H. Chapman Jones exhibited a sample of eikonogen, which he had had for three years, and which had not blackened. He observed that eikonogen crystallised out from a sulphite solution would be perfectly white. He had kept an eikonogen solution for a year, and it had worked well. The addition of bromide had been said to be disadvantageous, but he found a small amount gave more detail and a better image. He preferred sodium carbonate to the caustic salt, and gave the following as his formula:—

Eikonogen	25 grains.
Sodium sulphite	50 ,,
Sodium carbonate	50 ,,
Potassium bromide	½ ,,
Water	1 ounce.

For use, he diluted this with an equal volume of water. In reference to the solubility of eikonogen, Mr. Jones observed that an alkaline solution dissolved more than plain water.

Mr. W. E. Debenham found a small quantity of bromide in an eikonogen developer advantageous in keeping the shadows clear, and preferred boiled to distilled water for mixing the developer. Since the methylated spirit had been corrupted he had abandoned it, and used a small quantity of citric acid, which he used in the proportion of thirty grains to the ounce of pyro. He had kept such a pyro solution for four months, and it had only very slightly discoloured.

Mr. Chapman Jones asked what was the object in keeping pyro in solution?

Mr. Debenham thought it was convenient, and considered the dry-pyro plan objectionable, as one could not easily tell the amount of it used, and a little pyro made so much difference.

Mr. Chapman Jones regarded hydroquinone as the worst developer and the best stainer. It would bring out frilling better than any developer he knew of, the other parts of the formula being the same.

Mr. L. J. Montefiore had used hydroquinone a great deal, and never found the plates frill.

The Chairman said many workers complained of being unable to get clear shadows with hydroquinone. He had a five per cent. solution of hydroquinone in methylated spirit, water, and sulphite, which had kept good for about three years, and during the last four months had gone nearly black.

Mr. CHAPMAN JONES had found that hydroquinone and sodium carbonate would not develop an image on some plates.

Mr. DEBENHAM thought that the introduction of the caustic alkalies had helped the developer.

Mr. E. CLIFTON was of opinion that the caustic alkalies had done injury to the developer, as the lights were clogged up and the shadows not clear, the plates looking as if they were under-exposed. He thought hydroquinone better with carbonate of soda instead of caustic soda, the negatives acquiring more of the characteristics of pyro development.

Mr. CHAPMAN JONES could not see why eikonogen and hydroquinone should be mixed. With the eikonogen developer already mentioned he obtained any density he required.

Mr. CLIFTON said the quickest developer, and the one which gave most density, that he knew, was the one recommended by Messrs. Marion & Co. for exposures of one-thousandth of a second and under. It had to be used warm, but it brought out the image in a very short space of time. The formula was :—

Eikonogen	1 part.
Potassium carbonate	2 parts.
Sodium sulphite	5 ,,
Hot water	30 ,,

Mr. H. A. LAWRENCE had exposed two plates for the same time, and had attempted to develop one with ferrous oxalate, which, after an hour, gave no image; but the developer mentioned by Mr. Clifton gave a remarkably dense image.

Mr. W. BEDFORD preferred eikonogen to hydroquinone for bromide prints, as the latter was rather unmanageable. A small amount of bromide had a remarkable effect with the carbonates. Possibly caustic alkalies passed through the film much more rapidly than the carbonates, and tended to degrade the high lights, and provoke halation.

Mr. MONTEFIORE said he found rodinal good for portraits, but to get density he had to apply a hydroquinone developer afterwards.

Mr. CLIFTON said that he habitually used pyro, sulphite, and carbonate of soda, without bromide. For bromide paper he used Mr. Cowan's eikonogen formula, with lithium carbonate, very successfully. It did not answer for all makes of paper, as it left a lemon-coloured stain on some. The stain might be prevented by using a weak acid bath in the same way as with iron. Otherwise the developer got rid of the acid bath altogether, and the pictures were presumably more permanent, and the developer did not seem to give such clogged shadows as ferrous oxalate.

Mr. E. W. PARFITT had found that the anhydrous carbonates gave less stain than the ordinary carbonates. He inquired why Continental plates invariably fogged with ammonia.

Mr. DEBENHAM said that the same thing had been charged against American plates. He had, however, successfully developed the M. A. Seed Company's plates with ammonia. They were the most rapid plates he had ever used.

The meeting subsequently adjourned.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 21,—Mr. F. Bromley-Smith in the chair.

Messrs. A. Boucher and J. Avery were elected members of the Association.

The Chairman exhibited Furnell's shutter, which could be used either for time or instantaneous exposures.

A brief discussion as to loss of density in fixing, introduced by Mr. Teape at the previous meeting, took place, the influence of developer stains, and the fact that the negatives are looked at while still wet, being referred to as increasing apparent density.

MR. CAREY LEA ON "DISRUPTION OF THE SILVER HALOID MOLECULE BY MECHANICAL FORCE."

MR. A. HADDON drew attention to a paper on this subject by Mr. Carey Lea, in the current number of the *Philosophical Magazine*, which, at his suggestion, was read to the meeting. Commenting on Mr. Carey Lea's claims, Mr. Haddon complained that Captain Abney, Messrs. A. L. Henderson, Cowan, and Wellington had been ignored entirely by Mr. Lea in his references to his own experiments in producing a latent image by pressure. It was a matter which should be set right, and he thought that the whole credit of the experiment should not be claimed across the Atlantic. The paper was of great interest, and he (Mr. Haddon) did not wish to detract from what Mr. Carey Lea had done, but he thought the whole paper should be read to the members.

After the paper was read by Mr. G. W. Atkins, Mr. T. BOLAS observed that he thought Mr. Carey Lea should have mentioned the experiments of those who had discovered that a latent image was produced by pressure. At the same time, it seemed to him that what Mr. Lea had claimed as new was the disruption or blackening of silver chloride by pressure.

INTENSIFICATION.

The adjourned discussion on this subject was resumed by Mr. W. E. DEBENHAM, who said he could not understand the absence of a necessity for intensification which several members spoke of at a previous meeting. His own practice was frequently to make thin negatives and intensify them. He found that iodide of mercury followed by Schlippe's salt gave a greater amount of intensity than other mercury intensifiers, and the image did not change as others did. Intensification was often condemned because the negative was not properly fixed first. By the process he preferred it was shown at once whether the negative was fixed or not, which was not the case with other processes.

Mr. J. S. TEAPE had used Mr. Debenham's process years ago, and found that he got a great deal more density than he wished for, and the intensified image could not be reduced down. He preferred the two processes he had previously referred to, because, if too much density were obtained, it could be reduced.

Mr. DEBENHAM said that the mercury image could be reduced before it was "Schlipped," or reduction could be effected by any chloride process.

The meeting terminated after some further discussion.

North London Photographic Society.—July 19, Mr. J. Brewer in the chair.—The Secretary exhibited Messrs. Beck's "Frena" hand camera for films, and Messrs. Houghton's "Shuttle" camera for quarter-plates, which had been lent by the makers for that purpose. The action of the "Frena" in releasing the films after exposure, each film coming to the front in turn, was much admired, as also the various arrangements for sighting and exposing which have been well worked out in a convenient and practicable manner. The peculiar and special action of the "Shuttle" was fully explained, the simplicity and certainty of the changing movement being of especial interest, while the arrangements for focussing and exposing were thoroughly examined and appreciated. The opinion was strongly expressed that both cameras, each for its own special work, should take very high rank among the hand cameras now before the photographic world. Messrs. Beck's "Hynoe" printing frame was also introduced, and attracted much interest. Satisfactory reports were received of the Eastman chloride paper, most successful prints being shown, and the trials of the Ilford isochromatic plates had given great satisfaction, one especially fine negative of cherries being shown by Mr. Brewer. Mr. A. E. Smith showed pictures taken with lenses arranged as in an opera-glass, giving a telescopic result, and the Secretary showed cardboard dark slides made for use with films. No meetings during August.

North Middlesex Photographic Society.—July 25, Mr. F. Cherry in the chair.—About thirty-five members and friends were present, and three candidates for election were nominated. The Chairman introduced Mr. Thomas Bedding, who addressed the meeting on *Photography by Rule*. He contrasted the somewhat rule-of-thumb methods of the early workers with the present craze for innumerable formulæ, each requiring to be weighed and measured with scrupulous nicety, and each (though compounded to effect the same purpose) differing so widely in their constituent parts that neither science nor judgment seemed to have been consulted in constructing them. He expressed the opinion that the work produced in the early days had yet to be beaten, and that the general average was higher then than now. He pleaded for a cultivation of the reasoning powers based upon the worker's experiences, whether successes or failures, and deprecated an implicit trust being put in incomplete tables of exposures and fallible actinometers. He urged upon his audience that all could and ought to acquire technical excellence, upon which those who possessed artistic feeling might base their higher attempts. In the conversation that followed, Messrs. Beadle, Wall, Matthews, Pither, Johnson, Smith, and the Chairman took part. A vote of thanks was passed to Mr. Bedding for his paper, pregnant as it was with points of interest. Views taken at Kingsbury and Burnham Beeches were then voted upon. The latter competition was well entered for, and the vote of merit was accorded to Mr. Marchant. The remainder of the evening was devoted to technical questions and answers. The next meeting will be held on August 8, Mr. Marchant in the chair, when the various methods of harmonising harsh negatives will be discussed. Visitors welcome.

Hackney Photographic Society.—July 12, Mr. Beckett in the chair.—Work done on excursion to the Zoological Gardens was shown by Messrs. Sodeau, Dean, Nunn, Roder, and the Hon. Secretary. Mr. Pollard showed some prints of Tintern Abbey. He was asked if he had permission to photograph there, but he stated he had to pay 2*s.* 6*d.* to do so. Mr. REYNOLDS asked could he use an ordinary reducing solution for Sandell plates when necessary, as he could not manage that quoted! The CHAIRMAN preferred Howard Farmer's formula. The ferricyanide would get exhausted after a time. Mr. SODEAU said, in using too much ferricyanide, there would be a loss in the shadows. Mr. GOSLING asked if any one had obtained too much density with Ilford pyro formula. The CHAIRMAN observed that if that was so, too much pyro was used. He then called upon Mr. Hill to give a demonstration of the Cresco-Fylina process. Specimens of the process were passed round. The idea was that on immersion (into the above mentioned solution) of a positive or negative, the film would leave the plate and expand into nearly twice the size (demonstrated, with result that equal enlargement took place), and was then transferred to either an opal glass or paper in case of a positive, or glass for negative. The after process was precisely as would be the case of an ordinary print or negative. Mr. HILL stated that hydroquinone was the best developer to use for producing the original negative. Alum would act as a repellant, so was not advised, though citric acid could be used in pyro solution. Mr. BARKER asked if alkali would affect the stripping. Mr. HILL advised carbonates in preference to hydrates, though ammonia would enlarge perhaps better. Mr. POULSON wanted to know if, in drying, dust was likely to affect the plate; but was informed that it would be perhaps better to wash. Mr. GOSLING then gave a demonstration on Development. He advocated the old theme of one developer, and he preferred pyro-soda. He was an "Ilford" man, he said, as he had learnt all he knew from "Scraps," and consequently the plates, &c., he used, were of that firm's manufacture. He then developed a negative and lantern plate, but used too deep a light (in the general opinion of those present), which was constructed (for the occasion) out of a biscuit tin.

JULY 19, Mr. C. F. Hodges in the chair.—Mr. Nunn showed prints taken of the animals at the Zoo, and a plaster mould he had photographed gave six seconds, with rapid plate, *f*-16 by gaslight. A discussion on stickling (when using gelatino-chloride paper) was then taken up. Mr. REYNOLDS advised the use of a glass which was first heated and then putting on wax and rubbing with flannel until very little wax was left. The CHAIRMAN had used ebonite, and, as an emergency, the *papier-mâché* trays now so commonly used. Mr. DEAN said he thought if alum were used before squeegeeing to the plate prints would not stick. Mr. POULSON used ferrotype plate. The CHAIRMAN observed that people, as a rule, were too much in a hurry, and tried to peel them off before thoroughly dry. Mr. Dean showed a print from a mayfly which he had shut in a book and then photographed. The edges were stained on negative which had been developed with ferrous oxalate. Mr. BECKETT observed that he would put the negative direct into the fixing bath. Mr HENSLER asked how to stop up holes in negatives. Mr. FOULKES-WINKS said if thin negative he would varnish and then use the pencil. Mr. BECKETT said he would match the colour of the negative with colour. The CHAIRMAN

said he once lost part of a negative through the film getting torn. Mr. FOULKES-WINKS said he would advise, under such conditions, that a print be taken in platinum, then filling in with pencil, and then a reproduction taken. A question was then asked as to a good combined toning and fixing bath for aristotype prints. The Eastman last formula was recommended. Mr. SODEAN observed that corks in these bottles of solution were not to be recommended, as these solutions would not keep so well. A question was asked on intensifying with quinol. Mr. BECKETT said he used cyanide of silver as fixing; if not thoroughly washed, stains would result. Mr. WINKS said, when printing for platinum toning it would be best to print darker than usual. Mr. HENSLER then asked how to use saturated solution of hypo. Mr. SODEAN said, Take one ounce of solution, and one ounce of water. Dr. Colquhoun was nominated for membership. Mr. B. Foulkes-Winks then gave a paper on *Dodges*. Among the hints given were how to back plates, how to reduce with an ordinary camera, flatten silver prints (by passing paper-knife over the back, to cure pinholes and transparent spots (the former with retouching medium and pencil, the latter with a tint composed of black, blue, and crimson lake), blisters (pricking at back of print), and he advised any one using silver paper to use a sixty-grain bath.

Leytonstone Camera Club.—July 23, Outing to High Barnet, which was reached shortly after three o'clock, where the company were met by Mr. Hubert Elliott of the firm of Elliott & Sons, by whose kindness they were all provided with "Barnet" plates. Under the guidance of Mr. Elliott the company were piloted round Barnet and Hadley which are full of historical subjects. The stocks on the green, the High Stone, Monken Hadley Church, the old oak commemorating the scene of the battle of the Roses, Hadley Woods and various other spots having been visited, the party were invited to Mr. Elliott's mansion to a most sumptuous repast, and were next shown over the grounds, where boating on the lake and tennis were in full swing. Permission having been given by the host, several members had some excellent shots in the grounds. The company were next shown over the house. The pictures (some of which were of great value) were specially admired. Mr. and Mrs. J. J. Elliott having been thanked for the kind manner the Club had been received, the party were next invited to inspect the Barnet Plate Works, at the entrance of which they were met by the Manager, Mr. Birt Acres, who personally, in conjunction with Mr. Hubert Elliott, showed the whole of the premises, several of the managers of departments and others being in readiness to give special information of their respective departments as they in their turn were visited. To describe all that was seen would occupy more of your valuable paper than we dare do, as there would be little difficulty in taking several pages; but the carbon enlargements, life size, of figures and animals, and the Cadett machine for coating plates, for which the machinery in all departments was at work, were specially interesting. In fact, if all amateurs had seen, as we saw, the process that a plate has to go through from the glass crate to the packet of dry plates, they would marvel how we can possess them at the price we do. When the last department had been through, of which there had been about forty, we were surprised, although we had hurried through, it had taken two hours. Upwards of 100 plates were exposed.

Putney Photographic Society.—July 23, Outing.—The members met at Molesey Bridge and proceeded to the lock and weir, where some interesting views were taken. From Molesey the river bank was followed past Hampton Court and Thames Ditton to Surbiton. Saturday being the day of the Kingston Regatta, there was a rare opportunity for obtaining hand-camera negatives of the river crowded with pleasure craft of all kinds and sizes, not forgetting the City State barge, the "Maria Wood," so well known to all frequenters of the upper reaches of the river. Before proceeding on their holiday tours, several members tested plates and films of various makes, to compare their respective qualities, and much useful and practical information was obtained. Mr. Gorin exposed three of the new "Sandell" plates on the same subject—a clump of trees and bushes surrounding a pond; working in a fair diffused light at 5 p.m., with a stop of *f*·22, he gave one plate an exposure of about one-twentieth of a second, another one second, and the third twenty seconds. The negatives were developed with pyro and ammonia, and all three came out extremely well, the snap-shot being only slightly under-exposed, the one second correctly exposed, and the twenty seconds' exposure having none of the usual signs of extreme over-exposure; in fact, with more experience in the manipulation of these plates, and particularly in judging the density when developing, there can be little doubt that the under-exposure could have been greatly modified, and that the over-exposure would have yielded a negative in no way inferior to the apparently correct exposure of one second. Mr. Zachariasen carried out some experiments on the relative merits of plain and isochromatic films, the latter with and without a yellow screen. The subject chosen for the experiment contained yellow houses with red facings, pale blue blinds, blue slates, and light and heavy foliage in the fore and background. The results obtained fully confirmed previous experience, that for some subjects the isochromatic films have decided advantages, and that this is increased by the use of the yellow screen. The screen was of a light lemon colour, increasing the exposure four times, as proved by the following experiment. A half-plate film was exposed in camera divided by stereoscopic division, one-half being exposed for five seconds through a lens fitted with the yellow screen, the other half through a plain lens for one and a quarter second; the uncut film was then developed, the two negatives appeared at the same time, and development proceeded steadily. When taken out, both were equally developed, proving the relative correctness of the two exposures. A gas lantern, fitted with a two-feet burner, and provided with a deep ruby glass, eight inches by six inches, and a ground glass placed inside, was used during the development. This gave a soft and even illumination, quite ample for judging detail and density. Care was taken to carry on development at some four feet from the lantern, approaching it only to watch progress. The edges of the films kept perfectly clear; it is therefore obvious that no fogging took place, and that the objection occasionally raised to the use of isochromatic plates and films, that they must be developed in a very feeble light, is not a serious inconvenience when the bright light is of the right quality and carefully used. The next outing of the Society will take place at Carshalton, on August 6.

South London Photographic Society.—July 18, Mr. L. H. Greaves in the chair.—Mr. J. Miller read a paper *On Photographic Dodges and Combination Printing*. After a few hints as as to the practical use of the camera, Mr. Miller advocated the use of the following developer, which he had used for a considerable period in Great Britain and South Africa, and with it had been able to develop plates of any make: A.—Sulphite of soda, 300 grains; citric acid, 20 grains; pyro, 100 grains; distilled water, rain water, or boiled water, 16 ounces. dissolve ingredients in order named, each to be dissolved before the next is added. B.—Bromide of potassium, 50 grains; water, 60 ounces. C.—Liquor ammoniæ ·880, 2 drachms; water, 16 ounces. For normal exposure take half an ounce each of A and B. In another measure take half an ounce of C, adding it to A and B immediately before development. For under-exposure use less of B and more of C; for over-exposure use less of C and more of B. In cases of great contrast reduce the quantity of A. The lecturer stated that he considered every negative, no matter how good, was capable of improvement, and proceeded to explain how this could be effected. Before anything was done he always took a rough proof from the negative. Matt varnish was useful to increase contrasts, as it could easily be scraped away from any part which it was desired to print more deeply. It could also be used to retard or keep back any part that printed too deeply, and afforded a fair surface to retouch or stump upon. Tissue paper without any grain, such as is used by draughtsmen, could be employed to effect similar results, by fastening it on the back of the negative with starch. Portions of this could be cut out with a knife and afterwards removed easily after damping. The paper could be made transparent by applying the following mixture with a brush, viz., Canada balsam dissolved in benzine, using sufficient of the former to prevent the solution spreading when used, and afterwards adding three or four drops of castor oil. Portions of negatives could be blocked out by the application of lamp-black to the paper. Mr. Miller advised the use of a piece of discoloured silver paper in the frame when making prints to prevent discolouration and contraction. Prints should be washed and toned as quickly as possible. The faces should be sponged before being placed in the toning bath, as this facilitates toning. The bath was made up as follows: Acetate of soda, 340 grains; bicarbonate of soda, 35 grains; chloride of gold, 4 grains; distilled or boiled water, 80 ounces. Keep for a day or two before using. The various methods of producing combination prints on silver paper were dealt with at length. To remove the discolouration from the edges of old plates, and for reduction, the lecturer advocated the following, viz., iodine dissolved in water, using a few crystals of bromide of potassium to bring about dissolution, and adding same to the hypo bath. The solution of iodine must not be too strong.

Brixton and Clapham Camera Club.—July 19, Dr. Reynolds (President) in the chair.—Some interesting questions were taken from the box and discussed, one of them being, "Is it necessary that the axis of the lens should be at right angles to the plate?" Upon this opinion was fairly evenly divided, but probably the majority considered that it was not absolutely necessary. Another question, which is of interest at this season of the year, was, "For sea pictures is it advisable to use a quick plate and a small stop, or a slow plate and a large stop?" and the meeting seemed to favour the latter view. A third question was, "Does any member find the Ilford 'P.O.P.' paper tone rather slowly?" This was answered in the affirmative. Subsequently the Club lantern was used to throw upon the screen some slides contributed by Mr. F. Goldby and the Hon. Secretary.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—July 14, a party of sixteen members had an outdoor meeting down the Tyne. The party journeyed by the one o'clock boat from Newcastle Quayside to North Shields, several exposures being made at the shipping on the way down. On arrival at the Fish Quay, the number of cameras on the scene caused a deal of excitement amongst the fisher folk, several of them being very anxious to be photographed. After exposing a number of plates on the various groups, the party crossed the river to South Shields, when Mr. William Parry, who ably acted as leader, photographed the members. After tea Mr. Parry kindly showed them over his studios and printing rooms. A most enjoyable day was spent, and the weather was all that could be desired.

Correspondence.

LOSS OF DENSITY IN FIXING.

To the EDITOR.

SIR,—I am very glad to see your leader in the current JOURNAL on the question whether the hypo bath can really exert any solvent action on the negative image during fixation. I always dismissed the idea of it being possible, seeing how very much this seemingly innocent and dilute solution differs from any known solvent of silver.

I fear I must differ from your remark that "a wet negative shows greater apparent density than a dry one." My experience would put it just the other way, for frequently a negative which—when developed, fixed, and washed—has been considered too thin, and is consequently put aside for intensification, when thoroughly dry has been found to be of ample printing density. Possibly the monochromatic nature of the dark-room illuminant may sometimes account for this.

There is another curious point about gelatine negatives that I have never seen mentioned or noticed anywhere. This is, the difference in intensity and vigour of one intensified immediately after fixing and washing and one which has been allowed to dry first, the latter being by far the better of the two.

The actual reason of this I do not know, but it seems certain that some molecular change takes place in the film in the process of desiccation.—I am, yours, &c., A. HOWARD BENHAM, A.M.I.C.E.

4, *Albert-terrace, Albert-road, Regent's Park, N.W., July* 22, 1892.

THE STOPS OF FRONT COMBINATIONS.

To the EDITOR.

SIR,—Will you kindly tell me how to estimate the value of the stops—in other words, how to estimate the exposure when using the front lens of a rectilinear combination as a single lens, as suggested in your leading article of June 24? I tried it yesterday, using the front lens of my nine-inch Ross's universal symmetrical (the camera not having sufficient draw to use the back lens), and gave four times the exposure I should have done using the same stop with the complete lens, which I thought was theoretically what I should require. This, however, gave over-exposure, and I think three times would have been quite sufficient.

It seems to me that, if one was sure of the exposures, it might sometimes be very convenient to use the lens in this way for distant views.—I am, yours, &c. J. H.

July 19, 1892.

[We have dealt with our correspondent's communication in another part of the JOURNAL.—ED.]

SPEED OF PLATES.

To the EDITOR.

SIR,—The outcome of the two letters of Mr. Sterry and Mr. Phillips is to draw attention to the one essential definition of sensitiveness which Messrs. Hurter & Driffield have adopted in their method. It is to find the first term of a regular series of exposures in which the resulting densities increase by regular increments. Now, this method leaves entirely out of the question whether this correct scale of graduation has sufficient opacity in the highest terms of its scale to provide practical printing "density" in a negative. The practical consequence is that, when Messrs. Hurter & Driffield's method is applied to certain classes of emulsions, it indicates a sensitiveness which is not substantiated when the plate is exposed in the camera, and a practical printing opacity becomes a *sine quâ non*.

For instance, Messrs. Hurter & Driffield, in their original paper to the Society of Chemical Industries, mention that they had found the Ilford red label to be the quickest plate they had tried.

Now, it happened that when this paper came out I had been comparing in the camera different brands of plates, and found that the plate named was by no means so sensitive, from a *practical* point of view, as most of the other rapid brands of plates. It is true that it gave detail (what Messrs. Hurter & Driffield would call correct gradation) with short exposure, but to get printing opacity (density, as a photographer calls it) a considerably longer exposure had to be given.

I feel quite free in mentioning this instance, as the Britannia Works Company have lately superseded the plate in question by a *new* Ilford red label plate, which is entirely different in "density"-giving capability, and consequently is twice as rapid as the old brand.

Fortunately Mr. Sterry, in his table of examples, has provided me with a means of illustrating this point. I must first mention that, although Messrs. Hurter & Driffield are obliged to measure actual *opacities* in their instrument, these opacities are translated into physical *densities* on the scale of the instrument. This peculiarity of the system has given rise to much inconvenience and misunderstanding, and, to make the figures understood by practical photographers, I have translated Mr. Sterry's densities back into opacities.

	1	2	3	4
1½ C.M.S.	1·23	1·38	2	1·45
2½ ,, ...	2·14	2·96	3·17	2·7
5 ,, ...	4·8	7·25	5·5	5·9
10 ,, ...	11·5	18·5	10·5	13·5
20 ,, ...	28	44	16·5	29·5
40 ,, ...	58	84	21·5	60·5
80 ,, ...	159	165	27·5	94
160 ,, ...	166	170	35·5	164
Actinograph speed	23	31	52	31

In order that the reader may grasp the meaning of the above figures, I should mention that in a negative required to print a complete scale of tones from white to black on platinum paper, and in which the black is represented by clear glass, the proper opacity for white is 54. In other words, if we find the greatest amount of light to which platinum paper can be exposed, and still be white when developed, exactly 54 times this amount of light is required to print dead black on the same paper.

Now, in photographing a group of white objects with a full scale of tones down to black, it would be necessary that the highest lights in the negative should be represented by an opacity of 54.

On referring to Mr. Sterry's trials, it will be seen that in No. 1 plate an exposure of 40 seconds gave an opacity of 58 (sufficiently near for our purpose); but, taking No. 3 plate, which the actinograph method makes nearly twice as sensitive as No. 1, it will be seen that the same exposure (40 seconds) only gives an opacity of 21·5 with the same development. It therefore follows that, if No. 1 and No. 3 plates were exposed for the same time on the group of white objects, the exposure being just right to give a maximum opacity in the case of No. 1 of 58, the highest opacity in the No. 3 plate would be only 21·5, and the negative would be too thin to give a correct print, and yet Messrs. Hurter & Driffield's method would lead the photographer to suppose that No. 3 plate only requires half the exposure of No. 1.

The fact is that No. 3 plate is coated with a poor, thin emulsion of detail-giving capacity, but wofully short of density-giving power, and in ascertaining its *practical* sensitiveness a very considerable compromise would have to be made to get anything approaching printing density, and I should prefer not to use it at all for making negatives. There is very little that is absolute about the science of photography, and probably the final method of ascertaining the sensitiveness of plates may be something of a compromise between the "scale of graduation method" and the "density-giving" method.

I still hold to my original objection to Messrs. Hurter & Driffield's method, that, giving a white light scale of sensitiveness, it can not express the average camera sensitiveness of different makes of plates. My objection to the standard candle I stated to be a very minor point. Perhaps it is as reliable a standard as any other.

Would Mr. Sterry kindly say what he means by the term development factor? I find no mention of it in Messrs. Hurter & Driffield's paper.—I am, yours, &c., ALFRED WATKINS.

Hereford, July 24, 1892.

FUNGOID GROWTHS ON LANTERN SLIDES—FUGACITY OF BROMIDE PRINTS IN HUMID CLIMATES.

To the EDITOR.

SIR,—You will, no doubt, remember my sending you several specimens of lantern slides (in 1889 or 1890) to show the fungus growth on the covering glasses. I am now sending you through my brother at home two specimens of chloride plates of English manufacture which show the effect of this climate. I am sorry I cannot say what make they are, but they are specimens of what is going wrong with a large batch of chloride transparencies out here. You will notice, 1, that the film splits and leaves the glass; 2, that a fungus growth has appeared between the glass and the film. This may possibly account for the film leaving the glass. I think the glass used must be French white, which grows fungus here faster than any other kind.

I draw your attention to the above because other makes give results which stand this climate perfectly. Whatever claims the chloride plates have to priority, they are no use here.

Last year I sampled several makes of chloride plates purchased here, and every plate developed dead black all over with hardly a sign of the picture. Several others tried them with the same result and we let the plates alone. I have recently received a few boxes of rapid and slow lantern plates through my brother, and the slow plates develop dead black without exposure to white light. Others confirm my results, and I am now convinced that the plates will not stand the change in climate. I should like to know whether these plates, if kept at a temperature of say 90° F. for some time in England, give the same results. Rapid chloride stand much better, but also lose much of their proper qualities. If the above heat test causes no change, the air should be damped. Our humidity at present ranges from 10 to 95 per cent.

While on the subject of the Indian climate, did you read my article in the *Indian Journal* some months ago on the destruction of bromide prints by keeping them face to face with platinotypes? After two years my bromides have almost disappeared, while the platinotypes stand perfectly. This is undoubtedly owing to something peculiar, as the platinotype picture prints itself on the bromide by destruction. If the platinotype or bromide were imperfectly treated the destructive action would take place all over. I feel sure it is a chemical action between the platinum and silver requiring a high temperature, excessive humidity of air, and gentle pressure to secure contact.—I am, yours, &c., JOHN S. GLADSTONE.

Gillander House, Calcutta, June 21, 1892.

[We have commented upon our correspondent's interesting communication elsewhere.—ED.]

ENLARGEMENT.

To the EDITOR.

SIR,—The difficulty raised by your correspondent, Ethel Constance May, is not so great as she thinks. From the formula $\frac{D}{f+x} = \frac{D-f}{f} = \frac{1}{n}$

Where x = increment of focal length, and n = number of times linear enlargement, it is easily seen that $\frac{f+x}{f} = n+1$.

Hence, to obtain the new focal value of a stop, we multiply the denominator of its former focal value by $n+1$. Thus, if $n=3$, f-8 becomes f-32, requiring sixteen times the exposure for f-8. Of course for reduction n is fractional.—I am, yours, &c., CLIFFORD E. F. NASH.

Cheltenham, July 25, 1892.

Exchange Column.

*** No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Exchange Chambers' 15×12 W. A. R., new, for good whole-plate modern camera and three backs.—F. & H. Dann, Photographers, Reading.

Will exchange 15×12 Ross' landscape lens for whole-plate wide-angle rectilinear, any good make.—Address, E. J. Lester, 7, Forest Hill-road, S.E.

Pneumatic safety bicycle, balls throughout, Dunlop tyres, new last summer, in exchange for 10×8 view camera, three dark slides, and tripod or lens.—Address, T. Wilson, 44, Swinley-lane, Wigan.

Will exchange Franks' Presto hand camera, pocket microscope and slides, pantagraph, and shorthand books, for Shew's guinea pocket camera.—Address, J. F. Teague, 44, Leighton-lane, Leeds.

Fifty-two inch cyclometer by Lége, adjustable to hub or spokes; exchange for Watkins' exposure meter or Thornton-Pickard shutter (half-plate).—Address, H. G. Perring, 6, Newington Green-road, N.

Will exchange 8×5 new Ross' Universal symmetrical lens, for Ross' No. 2 Universal lens, or Dallmeyer's 3D., or 8½×6½ Dallmeyer's patent rapid rectilinear lens.—Address, J. W. Coubi, Northgate, Hartlepool East.

Exchange background (distempered), 8 ft.×7 ft., Tylar's current producer and discharger, hand camera (carries six quarter-plates in three double slides), and quantity of photographic literature, for backgrounds (interior or exterior), or rustic accessories.—Address, Fred. C. D. Hurd, Photographer, Shepton Mallet.

Answers to Correspondents.

All matters for the text portion of this Journal, *including queries for "Answers" and "Exchanges," must be addressed to* "The Editor," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** Communications relating to Advertisements and general business affairs must be addressed to* "Henry Greenwood & Co.," *2, York-street, Covent Garden, London.*

W. Bramston.—No; there is no "assistants' union" in existence now.

Reducer.—Potassium ferrocyanide does not react with metallic silver, hence your failure.

L. R. Rice (Bridgend).—No; hypo is not poisonous. Your informant was probably thinking of potassium cyanide.

Palladium.—The new Eastman gelatino-chloride printing-out paper is amenable to the action of the burnisher just the same as albumenised paper.

R. Cameron.—The Cosmoramic stereoscope is practically the same as the original Brewster instrument, the wooden body being square instead of a pyramidal shape.

D. Fisher.—Yes; reversed negatives are sometimes taken by exposing the plate through its glass side without any appreciable loss of sharpness being found to result.

Alec (Perth).—It may be that the slowness of the fixing of the plates arises from the strength of the hyposulphite solution. Instead of using a saturated solution try the effect of slightly diluting it.

Lost says: "Could you give me the quantities of soap and alcohol for making a lubricator for burnishing silver prints?"—Two grains of Castile soap to the ounce of alcohol would form a suitable proportion.

Silendo.—Hydroquinone, or hydrokinone ($C_6H_6O_2$) is known to chemists by either of the names here given. The full chemical name of eikonogen is, we believe, Amido-B-naphthol-B-monosulphate of sodium.

Geo. Knight.—There is a work on *Collotype* by Dr. Julius Schnauss (translated by Mr. E. C. Middleton, and published by Messrs. Iliffe & Son, of St. Bride-street, E.C.), which is probably what you require.

Landscape (Brompton-road).—This correspondent asks us whether permission to photograph in the royal or public parks enables one to sell the views so obtained. We know of no regulation to the contrary. Do any of our readers?

Aretas (Stockwell).—It has, we believe, been proved that the electric spark, given off when either cut or rollable films which have adhered are separated by a little force, is sufficient to fog the sensitive layer. Yours is no uncommon experience.

A. C. W.—There are other methods of blackening an image bleached with mercuric chloride than those with ammonia, sodium sulphite, or hypo. For instance, an ordinary alkaline developer may be used to the advantage, probably, of more ultimate density than with either of the foregoing.

T. D. (Catford).—You over-estimate our capabilities in asking us to tell you "the reason why" you "cannot produce as good a negative as that which was shown at ——'s as a specimen negative on their plates." Send us one or two of your failures, and we may then be able to indicate the cause of them.

Thiosulphate.—Fix your negatives in this way: place them in the old hypo bath until they are cleared of the white bromide, which is ascertained by looking at the back; then transfer them for a few minutes to a fresh hypo bath and afterwards wash. When the first bath is exhausted pour it away for precipitation of the silver and let the second one take its place, a fresh one being made to supply its place. This will fulfil your ideas of economy.

Snap-shot.—The examples for a beginner in hand-camera work are above the average in point of merit. It is a moot point, however, whether such pictures as yours—notably that of a group of men emerging from a public-house in a highly "elevated" condition—are quite permissible. The indiscriminate use of the hand camera is to be deplored.

Helios.—Possibly small particles of wood were left in the rebates of your slides, and these may have adhered to the plates during exposure, and so have caused the transparent spots you speak of. Most beginners omit the precaution of well dusting the camera and slides before using them, an operation which is highly necessary with the cheaper forms of apparatus.

A. H. says: "Would you kindly tell me whether there any works on the preparation of dry plates, or where I could get the necessary information?"—The British Journal of Photography and its Almanac of former years contain information on the subject of dry-plate making of a highly complete and valuable character, which would certainly repay our correspondent for the trouble of searching. Abney's *Emulsions* is an excellent book on the subject, chiefly from the experimentalist's point of view. There is also a work in German by, we believe, Eder, which goes into the *minutiæ* of the process for manufacturing purposes.

Messrs. Philipp, Munson, & Phelps, of 7, Beekman-street, New York, write: "We have occasion to inquire into the history of the art of photography, particularly with reference to the use of gelatino-bromide emulsion upon paper for positives. We write to ask you if you can refer us to any full description of the use of gelatino-bromide emulsion paper for positives prior to the year 1879, or can give us any information which may possibly result in our finding such a publication. We may say that we have fully examined The British Journal of Photography, *Photographic News*, *Photographie News* Almanac, and The British Journal Photographic Almanac, and are familiar with references found in those magazines to these subjects. Any information with regard to the early history of gelatino-bromide emulsion as applied to paper will be gratefully received by us. We are in search of Dr. Monckhoven's *Treatise on Photography*, published about 1879, and also of a publication entitled the *Argentic Gelatino-Bromide Workers' Guide*, published at London about 1880 by Morgan & Co. If you happen to know where either of these works can be procured, we shall be obliged to you for the information."—We do not think that any such description or publication as our correspondents require is in existence. If they have digested what has appeared in The British Journal of Photography and its Almanac on the subject, they have secured all the information available; but, lest they may have overlooked it, we may refer them to our article in the Almanac for 1875 which deals with paper as a support for gelatino-bromide of silver, suitable, of course, for either negative or positive purposes. A further fact of possible interest in connexion with this matter, and one generally, if not entirely, overlooked nowadays, is that, in July, 1879, Mr. J. W. Swan obtained a patent (2968, July 22, 1879) for what was, and is, practically the modern process of gelatino-bromide of silver printing for developed positives. Monckhoven's *Treatise* is not now obtainable, but possibly Messrs. Morgan & Kidd, of Kew Foot-road, Richmond, London, S.W., may be able to supply our correspondents with a copy of the *Argentic Gelatino-Bromide Workers' Guide*, published in 1880.

Photographic Club.—August 3, *Outdoor Experiences*. 10, *Opal Pictures*. Bank Holiday outing, Berkhampstead; train from Euston at fifteen minutes past ten.

Herr Rudolf Mayer Nachf, of Munsterstrasse, Friburg, informs us that he has a dark room which may be used free by amateur and professional photographers visiting that town.

London and Provincial Photographic Association.—August 4, Report of the delegates to the Photographic Convention of the United Kingdom, held at Edinburgh. 11, Members' open night.

The freehold of the land and premises occupied by the Autotype Company at Ealing Dean, formerly part of the estate of the late Mr. Benyon-Winsor, was recently put up for sale by auction. The purchasers were the Autotype Company.

In our notice of the "Sandell" plates last week, we inadvertently referred to the "General" plate as the "General rapidity," thus implying that there was a difference of rapidity between it and the "Especial" plate. Both plates are, however, of equal rapidity.

Photographers often desire to take pictures of the interiors of the English cathedrals, and doubtless the terms upon which the necessary permissions may be obtained would be of general interest. Perhaps those of our readers who have had experience of this kind of work can enlighten us. In the case of Norwich Cathedral we are informed that the Dean grants permission on the following terms:—2*s.* 6*d.* per day, 5*s.* for two days, 20*s.* for a week, a fee of 1*s.* 6*d.* being charged in addition by the "sub-sacrist" for his attendance. As these figures read, it would be cheaper, as our friend remarked to us, to pay daily than weekly. The charges appear to us rather high, but they are eclipsed by the guinea per day which, we are told, is exacted by the authorities of Hereford Cathedral.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1683. Vol. XXXIX.—AUGUST 5, 1892.

THE DECAY OF PROFESSIONAL PHOTOGRAPHY.

The apprenticeship system in modern professional photography was subjected to some destructive criticism at the hands of Mr. Farmer in the course of the paper on "Deficiencies in the Early Training of Photographers," which he contributed to the Edinburgh Convention. That paper and the discussion that followed it are of considerable utilitarian value. The author has an undoubted knowledge of his subject, gained by experience and observation as an instructor in photography, and the speakers in the course of the discussion were representative men whose views on the points raised command attention.

In condemning the apprenticeship system in professional photography, and in adducing his well-recognised reasons why that system should disappear or be modified, Mr. Farmer indicates the existence of a state of things which if not dealt with ere long must undoubtedly react to the injury of photography as a profession in the near future.

Professional photography at the present time is admittedly not in a flourishing condition, and the causes commonly assigned for the depression include, of course, bad trade, severe competition, and the influence of the once-despised but now potent amateur. We fear, however, that a photographer himself is more often the cause of his own unfortunate position than are those we have just named. No parent in his senses would dream of apprenticing a lad to an ordinary photographer nowadays, and the reason for this strikes us as being equally available as an explanation of the ordinary photographer's lamentations over the smallness of his profits. In the establishment of such a man a clever, intelligent lad of fifteen or sixteen might pick up in the course of a year or so all that was to be learnt there, and probably a little more than his principal was competent to teach him.

For what is to be learnt in ninety-nine studios out of a hundred beyond lighting, posing, exposure, and development? The retouching, as one may gather from our advertisement columns, is generally put out; the printing is more frequently executed by trade printers than not, and in cases to the contrary is chiefly confined to one, or, at most, two processes. Again, photographers who do their own enlargements are remarkably few; and, indeed, to sum up the average photographer's business, it may safely be laid down that most, if not all, the work and its numerous varieties is "put out." In such cases, which, we believe, form the majority, we submit that the apprenticeship system is bound to fail on account of the inability of the principal to impart any but a limited range of practical knowledge to the youth he is supposed to teach.

But this is not all. The mere taking of the negative is often, if not exactly "put out" at least "farmed," that is, supposing a portrait photographer to have an order for a landscape embracing a house, a piece of architecture pure and simple an interior, or an *objet d'art*, &c., to photograph, he probably prefers not to undertake it himself, but to employ another photographer, who makes a speciality of such kinds of work, to produce the negatives for him. The growth of specialism in modern photography leaves the average professional photographer much in the position of a mere commercialist, with just the necessary superficial technical knowledge that will enable him to conduct his business with more or less success.

Of course, there are exceptions to the picture we are drawing, but we do not think they are sufficiently numerous to shake the accuracy of the outline. The race of photographers who collodionised and sensitised their own plates, sensitised their own papers, retouched their own negatives, did their own printing and enlargements, and in short carried on in their own establishments most if not all the work which to-day is "given out," does not seem likely to be perpetuated among the professionals of the present time. We should have nothing to urge in disfavour of this practice of "putting out" work if we could feel assured that it did not operate adversely to a photographer by depriving him of considerable practical knowledge, and placing an obstacle in the way of his transmitting such knowledge to others. These, however, are the two unfortunate effects which the system appears to us to have.

We regret very much to reflect that, in the endeavour to impart to a youth the necessary training and practical experience in order to qualify him as a thoroughly well-grounded, and, what is called, "all-round" professional photographer, it should be essential that he should not be placed at the mercy of one who should be his natural preceptor—a professional photographer—but apparently there is no help for it. The future of professional photography depends, fortunately, not upon professionals themselves, otherwise the outlook would be inexpressibly dreary, but upon the facilities provided for enabling young fellows to practically qualify themselves on the lines laid down by Mr. Farmer. Few as those facilities are at present, we are convinced they will not be without great influence for good in the near future, and we hope to witness a considerable extension of them.

CLEARING SOLUTIONS.

In writing last week of the "Alum and Hypo Fixing Bath," we showed how it combined with its function of fixing that of clearing the film, if not also of hardening it, an economy of labour which, under some circumstances, may prove extremely useful. Comparatively few, however, employ this compound bath, the great majority, simply as a matter of practice rather than one of preference, applying the clearing and hardening solutions,

Improving Negatives.—In a paper read before one of the metropolitan Societies, the author of it said that he considered every negative, however good it might be, was capable of improvement. In this opinion he is quite correct. We well remember some years ago being present at a demonstration of the carbon process by Mr. Lambert, when some very excellent portrait negatives were handed to him, with silver prints therefrom. The first thing he did was to improve the negatives. This he did by backing them with thin transluscent paper—*papier minéral*—and then working on that with a stump lightly charged with plumbago. Although the work only occupied him a minute or two for each, the effect was truly wonderful, although, as we have just said, the negatives, at first, were considered excellent. It is a little surprising that amateurs of the present day do so little in dodging their negatives, particularly as it requires no particular skill, and, moreover, is quickly done. For small negatives, matt varnish is preferable to paper, and it has the advantage of not discolouring with age, and is not so liable to injury. The varnish should, of course, be applied to the back of the negative. Those who have never tried will be surprised with what can be effected, and the ease with which it is done. If a shadow requires strengthening, the varnish is roughly scraped away. If lights require vigour, a few touches with a pencil, or a stump and black lead, is all that is necessary. If the contrasts in the negative are too great, they may be ameliorated by removing the varnish from the lights and leaving it on the shadows, or, if necessary, stumping the deepest ones over with the plumbago.

CONVENTION JOTTINGS.—II.

The Group.—In the earliest ages of the art, when exposures were measured by minutes, and sometimes many of them, it was an easy matter for the photographer when taking a group to uncap his lens, and then rush forward and take his position previously determined upon, afterwards darting to the camera and capping the lens without any trace of the movement showing in the picture. But in these times, and with plates of exquisite sensitiveness, methods of this nature cannot be had recourse to, the photographer must stand by his camera to touch the trigger at the moment he observes becoming quiet and expression on his subjects. This accounts for the absence of some prominent men from Convention groups, men who are on the spot, yet cannot be induced to trust their cameras into the hands of assistants even for the few moments requisite. It need scarcely be said that when a large and important group, like that of the Convention, is posed, numerous photographers other than the legitimately appointed one (Mr. Alexander Ayton, jun., in this instance) are anxious to have a shot.

The New Premises of the Edinburgh Society.—We visited the new premises of the Edinburgh Photographic Society, situated in North Castle-street, directly opposite the town residence of Sir Walter Scott. As a detailed account of it appeared in this JOURNAL a few months ago, we need now only say that it speaks much for the enterprise of the Society that on such a small member's subscription it has acquired such central, commodious, and well-fitted-up premises. Here are smoking, reading, general meeting, experimental, developing, and no end of other rooms. The library was in course of being arranged when we called.

The Apparatus.—As we stated elsewhere, the display of goods exhibited on the tables at Convention headquarters was only in progress when our first parcel from there was dispatched. Among the things which were *in situ* the day following were a peculiar little hand camera by Shew & Co., the action of which was unlike anything we had previously seen. It had no baseboard, the body being distended by internal mechanism; but, by pressing the top and bottom by thumb and finger, it instantly collapsed into the smallest conceivable space.

Careless Storage of Cameras in Travelling.—Said a lady, whose watchful eye was taking stock of the debarkation on the railway platform of a large collection of handbags, portmanteau, and photographic apparatus generally at a post-Convention outing at Callander, "Which of you gentlemen have been so insane as to have entrusted your cameras to the guard's van? I always thought you considered your cameras so sacred as to treat them as tenderly as we treat babies in arms, and here are two among the packages in the van. It's incredible!" Two of the large party, composed of ladies and gentlemen in nearly equal numbers, pleaded guilty to the delicate impeachment—one of them a well-known member who hails from Chesterfield, the other being ourself. But there's something to be said in extenuation, especially when one carries two cameras, one of which, as in our case, was somewhat large, and fitted with a roll-holder capable of containing several dozens of "exposures." When, in a crowded train, ten people have to find accommodation in one compartment, it is emphatically a case of *place aux dames*, and those who travel with ladies know what this implies.

Focussing Without a Screen.—Having next day exhausted the supply of plates belonging to our stereoscopic camera, on reminiscences of the Pass and Falls of Leny, bits of Ben Ledi, Loch Lubnaig, and the rich pictorial scenes in that locality, we had to fall back on the large camera, with roll-holder, for the outing the following day, when our party, filling two large waggons, drove through the Trossachs' Pass to the beautiful Loch Katrine. Unpacking the camera for the first time since the guard's van episode, we became painfully aware that its ground glass had been smashed into a state of "smithereens." What was to be done? The day was bright and calm, and all nature was lovely, but the nearest glazier's shop was many miles away, and even there they would not be likely to keep focussing screens in stock. A fragment, the size of two fingers, was secured, and held as near as could be guessed in the plane of the rebate of the frame, and upon this the focus of the middle distance was obtained with the full aperture of the lens, the iris diaphragm being then closed as far as it would go. The location of the subjects on the plate was ascertained by squinting along the tail-board of the camera, and, singular to relate, all the negatives taken that day by this once-for-all focussing are quite sharp. A piece of geometrically flowered glass was next day fitted into the camera, and formed an extraordinary, but on the whole a serviceable, substitute for a ground glass.

A Home from Home.—The Trossach Pass has had a certain reputation extending for ages back. This reputation savours of the "stand-and-deliver!" order of language. The most recent development or evolution of the sentiments entertained by men of the Roderick Vich Alpin Dhu calibre is reported to be associated with the hostelries of the district, where "Thy name and purpose, Saxon, stand!" more recently assumed the more civilised rendering of "Here's your bill, sir," delivered on a silver salver by a white-neck-tied waiter. This, from personal experience, we affirm to be a slander, so far, at any rate, as Callander is concerned, where we domiciled in the Callander Caledonian Temperance Hotel, the most beautiful and best-appointed of all the hotels we have seen in the Highlands, where the charges for tea, bed, and breakfast are scheduled as at five shillings, with ninepence for attendance. We never like to advertise hotels, but it is due to the present and reformed character of this town, which forms the key-note to the Roderick Dhu parts of the Highlands, that we should here give a new and more pleasant rendering of the "stand-and-deliver" idea so long prevalent.

ON THE SELECTION OF VIEWS.

I.

THE season has now arrived when genial weather and all the attractions of a pleasant English summer tempt photographers, both amateur and professional, to start in search of pictures, not only in the most favoured part of this country but in the less picturesque districts; for where are not pictures to be found by those who can see?

So universal has become the practice of this beautiful art both for business and pleasure, especially the latter, that it has become rather a rule, than an exception, that some one or other of every family

will dabble more or less in it. It seems so very easy for beginners to select views and bits to photograph providing they are fortunately situated with regard to their surroundings, that any hints as to finding suitable ones may seem superfluous and unnecessary.

It is not until the negative is taken, developed, and probably printed that it is discovered, although the view was so promising, the results are disappointing and very different from what was anticipated, coming out neither artistic nor pleasing, both of which qualities seemed assured when the picture was seen on the focussing screen. Many photographers cannot realise that it rests principally with themselves to produce either things of beauty or of no value almost irrespective of the scene, for the most unpromising in clever hands will supply beautiful pictures, examples of which we have every day. A view of itself is only so much material from which a proper selection has to be made, and the value of that selection will depend entirely on the perceptions and artistic ability of the photographer himself. To photograph a landscape without due consideration, simply because it appears beautiful to the eye, is to court failure. Supposing a number of choice works of art were put together indiscriminately and photographed, they would make but a sorry picture, but if properly arranged and lighted would be individually beautiful; so it is with landscapes; an aggregation of beautiful things that require care and discrimination in selecting; without, they are represented as a mere unsatisfactory jumble, the good qualities and attractive points are lost or with difficulty distinguished, the general result being unpicturesque and unsatisfying. The fault of most beginners, and some others too who have had more experience, is to attempt too much, that is, to represent too much on each plate, hence the hankering after wide-angle lenses. The undesirableness of using instruments of this class has been insisted on times without number, but there seems to be something fascinating in the power of including a tremendously wide angle that the advice to use less inclusive lenses has to be frequently repeated.

There is no disputing that wide-angle lenses are of great use in certain cases, in fact I do not know how we could get on very well without them, but for ordinary landscapes, I may say, they are never required. My advice is to always use as small an angle lens as consistent with the requirements of the subject; by doing so, the, artistic effect will be better. If, for instance, a ten-inch lens will include all required, do not use an eight-inch one; but if the photographer has a good series of lenses, and possesses artistic ability, he will soon see which will be of the most suitable focus and give the most pleasing results. However, this is not a dissertation on lenses, but how to select the best points for them to be used upon.

It does not follow, by any means, that the most beautiful landscape to the eye is the best for photographic representation, it is frequently the very opposite. Before setting to work, the photographer should critically examine the view he intends taking, gauging its suitability, independent of its colour, which often exercises a distracting influence, its examination through a piece of neutral-coloured glass is a help in this direction, and enables him to note the effect of the light and shade in a more correct manner than he otherwise could, until by practice he can estimate its proper photographic value by his unassisted eyesight. When thoroughly master of this, a great step has been taken towards the production of good work. It will be found that, in addition to the disturbing influence of general colour, local colour will have to be taken into account: as an example, a road, with a red brick building on one side, a bright sunshine, and on the other a whitewashed cottage in the shade. The probability is the white cottage and shadow will come out lighter than the red brick in the sunshine, owing to its local colour. This is but an instance; numerous cases, with varying degrees of effect, are frequently cropping up, and it is only experience that will afford the necessary knowledge to estimate their values truly. Still, by having some idea of the influence of local colour, very glaring mistakes may be avoided. Even with old hands, local colour will sometimes upset the balance of a composition, which has to be remedied afterwards, either on negatives or prints.

With respect to foliage, perhaps none give so poor a photographic result as the yew-tree; its sombre, black green and compact foliage coming out as a dark patch, void of detail in diffused light, even in bright sunshine, if included in a landscape, is mostly too dark for a pleasant effect. The white beam-tree and elder, on the contrary, photograph somewhat lighter than they appear. There is such an infinite variety in the form and effect of foliage that it is well worth a special study, and its value as foreground material cannot be overestimated.

Trees, irrespective of their own particular forms and colours, are most useful in breaking up horizontal lines in the landscape, often the only available material for the purpose; but, like most other things, there is a right and a wrong way of treating them. If trees in the middle distance come out black and heavy, by reason of the lighting or under-exposure, they generally spoil the picture; and when in the foreground, with too strong contrasts in light and shade, so that the lights are represented by white paper on the print, however good their forms may be, they are scarcely less so. A landscape photograph cannot be called good if the foliage is deficient in half-tones. The very rapid exposures now in vogue are very apt to produce these results, and are on this score to be deprecated. Sometimes it happens that the under-exposure of dark foliage is unavoidable. I may call attention to one particular subject that occurs to me, which almost invariably shows the bushes too dark. That is the general view of Box Hill, in Surrey—a favourite spot for photographers. Here the bushes come out as so many black spots on the hill-side; the brighter the day, the more decidedly spotty they appear. A slight haze might improve the effect, but in all the photographs I have seen of it the contrast is much too violent. These abrupt contrasts of colour frequently occur in chalk and limestone districts, where the outcrop is bare of vegetation, and the light reflected from the white surfaces in sunshine is so strong that the contrast between it and the green herbage tends to make a hard picture, requiring the utmost skill in exposure and development to overcome. The larger-leaved plants often supply most valuable forms for pictorial effect, notably the docks, digitalis, hemlock, and iris. The common thistle and nettle are not to be despised in this connexion, as they both, in form and colour, lend themselves to harmonious results. It need not be said that the foreground is generally the most important part of the picture, and on this account requires special attention. A good foreground is often the making of a picture, and an unsuitable or ill-chosen one its ruin. All the same, the distance must be by no means neglected because it takes a subsidiary place. No matter how beautiful the foreground may be, a peep of distance will wonderfully enhance its interest and pictorial value.

EDWARD DUNMORE.

DISRUPTION OF THE SILVER HALOID MOLECULE BY MECHANICAL FORCE.*

[Philosophical Magazine.]

EVERY FORM OF ENERGY DISRUPTS THE SILVER MOLECULE.

It is therefore true that every form of energy is not only capable of producing an invisible image (that is, of loosening the bonds which unite the atoms), but is also capable, if applied more strongly, of totally disrupting the molecule. This law, in a general form, was proved in previous papers with but a single exception, and that one exception is removed by the observations recorded in this paper.

As far as observation has gone, silver compounds are the only ones that exhibit this universal sensitiveness. Of other substances some are decomposed by heat, some by electricity or by chemical action, and a few by light.

It has now been shown, as I believe for the first time, that mechanical force is competent, without the aid of heat, to break up a molecule that owes its existence to an exothermic reaction.

It is important to distinguish between the two treatments here described. In the case of shearing-stress, force is expended in overcoming friction, and in so doing produces heat. It may be questioned, however, whether the very small amount of heat thus generated has anything to do with the reaction. The heat is not perceptible, it is momentary; and it has been elsewhere shown that though moist silver chloride can be broken up by heat, the action is slow even at a temperature of 100° C.

In the case of simple pressure, heat certainly plays no part. The material is small in quantity, is folded up in metal, is placed between large and heavy pieces of metal, and the pressure is applied gradually by means of a screw. Even supposing a slight increase of temperature, it could not exceed one or two degrees and would be momentary. As just remarked, heat does not produce an effect except at about 100° C., and after many hours.

The powerful affinity which exists between silver and the halogens is well known. That this affinity can be counteracted and annulled by simple pressure—that the halogen can in part be forced out of the molecule by mechanical means unaided by heat—is remarkable.

It need scarcely be said that this phenomenon has nothing in common with decompositions produced by mechanical force in substances such as silver or mercury fulminate, nitrogen chloride, and similar explosives. Such substances are all formed by endothermic reactions, and their decompositions are exothermic. Heat does not

* Concluded from page 490.

need to be supplied, but only what Berthelot has named a "*travail préliminaire*," an impulse to start the reaction. But silver haloids are formed by exothermic reactions; consequently their decompositions are endothermic, and require that the energy which was disengaged in their formation should be returned to effect their decomposition. The experiments described in this paper show that mechanical force may be made to supply this energy, and so play the part of light, electricity, or heat, without previous conversion into any other form of energy.

The thermochemical reactions of the silver haloids have been studied by Berthelot, and their reductions were found to be endothermic.* There can be no doubt, therefore, that an endothermic reaction can be brought about by simple pressure.

M. Carey Lea.

ADVANCED PHOTOGRAPHIC WORK FOR AMATEURS.

V.

One of the advantages in using rough-surface paper is undoubtedly the ease and certainty with which such can be printed and toned to any depth. Unlike bromide or platinotype (where, to a certain extent, exposure must dovetail with development), the rough-surface paper gives no trouble in this respect, being examined in the printing frames like ordinary albumenised paper. In toning, as a rule, a much weaker bath is used, and, by a judicious alteration of the ingredients composing the salting solution, quite a range of tones are obtainable, running from ordinary purple-black, through sepia-brown, to brown-black. It must, however, be borne in mind, when altering the various chlorides which form the salting solution, that their quantity in combination must be carefully considered, and the strength of the silver-sensitising solution made to suit such. For instance, one salting formula will work better with a sixty-grain sensitising solution than would be the case were the latter reduced to the strength of forty grains of silver to the ounce. It must also be borne in mind that some samples of paper will yield much finer results with one salting solution than that composed of some other chlorides, so that, once a good formula has been hit upon for each particular paper by experimenting, it is well to keep to it. In this alone an enthusiastic worker has much to engage his thought, and there are a great many papers in commerce quite suitable for use, even the common web paper, which can be bought in rolls of great lengths, and various widths, and varying tints. I have obtained excellent results from such, the price of this class of material being very much cheaper than that of Whatman's drawing-paper.

In toning, quite a range of colour is obtainable, provided suitable negatives are being printed from. In this class of work it is imperative that such have plenty of pluck and vigour. When this is the case, results will be obtained that will surpass any other class of printing material that I know of; therefore workers should aim at the production of bold, vigorous negatives. The miserable flat productions usually seen as the result of using very rapid plates are quite unsuitable for this class of paper, and, indeed, for both platinotype and bromide work also.

With suitable negatives, a good formula for purple-black tones is—

Water	120 ounces.
Acetate soda	300 grains.
Phosphate of soda	160 „
Tube gold	15 „

The printing must be carried further than would appear necessary when using ordinary albumenised paper.

For sepia or warm brown tones the printing is not carried so far, and a weak borax bath used.

For brownish black tones, a bicarbonate of soda bath is used, freshly prepared.

The treatment of the prints, both before and after toning, being as nearly as possible the same as for ordinary albumenised paper, the fixing bath I prepare as follows:—A gallon or two of a saturated solution of hypo is always kept in stock, and when going to fix my prints—say, in winter—I take one volume of saturated solution of hypo to four volumes of warm water; in summer, cold water may be sed.

The mounting of these prints is a pleasure, there being almost an entire absence of the cockling so troublesome at times with other papers. A good flour paste, well boiled, with a few drops of oil of cloves added by stirring well after it is boiled, and, when cold, pressed through coarse muslin, makes, for these thick papers, the best mountant it is possible to use.

To those workers who have never done anything in the way of preparing their own printing paper I can promise a genuine delight in their undertaking the salting and silvering of a sheet or two after the manner I have described. It is quite a cleanly and easily executed operation, and even ladies need not for a moment hesitate to try their hand. Should the silver solution, by coming in contact with the tips of the fingers whilst being applied to the surface of the paper, cause stains, such are easily removed with the aid of a little pumice-stone; and in very aggravated cases, such as splashes through accidentally spilling some of the silvering solution, an application of some powdered chloride of lime, rubbed by means of a damp flannel over the hands, will remove all traces of the silver stain as if by magic, and any smell of the lime is easily dispelled by using the juice of a lemon on the hands afterwards.

It is not, however, in the preparation of rough-surface printing paper alone that amateurs find scope for interesting occupation of more than ordinary pleasure, and once they have tasted of the delight it will be strange indeed if they do not long to fly at somewhat higher game, such as the salting and sensitising of cloth and other fabrics.

Therefore, should any one feel disposed to try their hand at printing on fabrics as a start, they need not be deterred by any thought about the difficulty of the operation, for they can from the Platinotype Company get ready-prepared sensitised material, such as nainsook, sent them on application, the working of which is by no means difficult provided suitable negatives be employed, for in reality it all lies in this. Supposing, therefore, it be desired to make a lady friend some little present in the way of a useful article, be it a marriage gift, or a slight donation to a bazaar for some worthy object, what is more suitable than, say, a dozen or two round or oval-shaped d'oyleys? and these, when carefully printed in platinotype, and handed to a member of the fair sex, to adorn, by means of an edging of lace or crochet work, ferms a gift that is always highly prized and quite permanent. I have seen a set of two dozen mats for finger glasses adorning a dining-table that gave no end of pleasure, and which were highly prized indeed, and yet the production of such was a matter of no great difficulty; indeed, any one possessed of suitable negatives could, with the greatest of ease, produce such.

In the selection of suitable subjects for such adornments, there is alone room for the exercise of much taste and thought, and, as a rule, it will be found that copies from photographs, portraits, engravings, pictures, &c., instead of from negatives taken direct, will yield quite as charming results, for, as a rule, a negative that will print well on some classes of albumenised paper would be too soft for such work; therefore I have found it best to prepare special negatives for this class of printing. Let us just take a case in point. Say it is desired to present to a lady a mat, or some other little souvenir as a birthday present. This may take the form of presenting a copy of a well-liked photograph, say, a portrait, and having obtained an ordinary print of this, which, for example sake, we will imagine is a vignetted head and bust of, say, half-inch size, the first step to take is to produce a somewhat enlarged negative from same, say, almost double the size. This is best done by placing the print in a printing frame carrying a sheet of patent plate glass. The print is then pressed close up to the glass by means of the back and springs of the printing frame. The latter is then placed on edge on the copying board, and with the aid of a *slow* bromide plate a negative is produced which is strong in contrast. This is easily accomplished when the exposure is such as to work in harmony with a developer that is strong in pyro and bromide. These points must be carefully attended to, and, of course, it is an easy matter by arranging the distance of lens and camera from the picture to make the image somewhat larger than the original; by this means there will be no grain of the paper visible, but in this class of work such is really not a matter of much importance. The great aim is to select suitable subjects and get good plucky negatives of such. I have found Mawson's lantern plates admirably adapted for this class of copying; so also are Edwards's *slow* isochromatic plates especially useful in all cases where black-and-white or coloured objects have to be copied. A fast plate yielding a thin image will certainly end in failure. However, once a good vigorous negative is obtained, the whole thing is reduced to an operation of the greatest ease. A supply of nainsook or other fabric is obtained from the Platinotype Company, and printed and developed with the necessary care; the picture is then cut into any desired shape by means of, say, a plate or saucer, as would be the case when rounds are desired, leaving a slight margin whereby the photograph is tacked by means of needle and cotton to some other suitable fabric as a flexible support. These

* *Mécanique Chimique*, vol. ii. p. 411. The reduction of silver chloride to metal involves an absorption of cal. 29·4. That to hemichloride has not been measured, but is, according to Berthelot, also endothermic. See also Ditte, *Les Métaux*, i. pp. 232, 233.

thread markings are then overlapped, when you get your lady friend to stitch on the lace or crochet-work as the edging.

Admirably adapted for such are yachting subjects, and, when these are vignetted, their suitability is enhanced; large originals can be easily reduced, and negatives made specially for this class of printing by exactly the same method, only in this case the camera and lens are moved further away when copying.

It is not only platinotype, however, that may be employed for this class of work; very delightful pictures can be obtained by many of the other methods of printing, especially the blue process.

T. N. ARMSTRONG.

"INDIVIDUALITY IN PHOTOGRAPHY"—A REPLY TO MR. H. P. ROBINSON.

I TRUST you will be kind enough to grant me space to reply to the remarks (so far as they relate to myself) contained in the paper on "Individuality in Photography," by Mr. H. P. Robinson, and read for him at the Photographic Convention.

When one is merely ridiculed in place of being argued with it becomes somewhat difficult to defend oneself. To condescend to the same tactics and fight with the same weapons is generally an easy enough way out of the difficulty (that is, if one should be unscrupulous enough) and it would be particularly easy in this case.

As ridicule, however, is mere impertinence in any serious discussion, I do not intend to avail myself of its questionable aid. I think I am not mistaken in discovering throughout the whole of Mr. Robinson's paper an under-tone of self-assumed infallibility. Indeed, the very fact that Mr. H. P. Robinson expects the members of the Convention to believe that my ideas are preposterous without any argument at all, but merely on the strength of his word, pre-supposes this.

Let it be granted that Mr. Robinson is the author of photographic work that has not been excelled, he surely cannot presume on this to set up as an authority in philosophy. The question of whether or no photography is to be reckoned as one of the fine arts is one in the settlement of which neither artists nor photographers can be allowed to have any special authority. It is not necessary to be either an artist or a photographer to discuss the matter, and it might be argued that, both being interested parties, each is only entitled to state his own side of the question, the decision resting with those who have no interest one way or other in the matter.

Mr. Robinson is no authority whatever on the question of whether or no photography is to be reckoned as one of the fine arts, or, if he is, the evidence of it has heretofore, like all honest merit, ever loved the shade. Disposing of the rest of Mr. H. P. Robinson's paper (beyond what relates to myself) by candidly admitting that I do not in the very least know what he is driving at, and confessing to a perfect impatience of his primitive logic, I pass on to his remarks upon my own paper. As the argument in my paper is a cumulative one, I have a perfect right to object to Mr. H. P. Robinson disintegrating it, and calling in question separate fragments, but I waive this point and argue the question. He ridicules and objects to the following statement: "The picture painted by the artist is a transcript of his own emotions, but a photograph is not a reflex of human emotions at all, unless indeed accidentally so, but is a direct reproduction of nature, and only through science the offspring of man." Mr. Robinson adds, "We must be grateful to the writer for allowing us the accident."

From this remark I deduce the origin of Mr. Robinson's confusion. If Mr. Robinson had had an adequate knowledge of what I take to be his mother tongue, he would have known that "accident" and "chance" are not always one and the same thing. For Mr. Robinson's behoof, and in no spirit of retaliation, I must point out to Mr. Robinson that all *unessential* qualities or properties come under the term "accident." If it is not too fine a point for Mr. Robinson to see, let me state that fidelity to an original (even approximate) is no *essential* concomitant of the processes which culminate in a photograph. It is not surely with the *intention* of producing a likeness of anything that any one of the processes takes place, and a likeness is brought about it is not that photography implies anything more than the action of light upon substances capable of being acted on. This is the only *essential* part of photography, likeness making is *accidental*. If a photograph turns out to be a transcript of any man's emotions, no matter how much he has done to bring it about, it is there what it is, the result of natural laws working entirely independent of his emotions, and is therefore strictly *accidental*.

Mr. Robinson must be very dense if he cannot see that this is an entirely different thing from a picture painted by an artist. A photograph *happens*, we shall say, to be what a man sees; a painted picture *is* what a man sees. Fidelity or likeness to an original is an *accident* in photography; in a painted picture, on the other hand, it is *inherent* and *essential*—part of the creation. Do not mistake me. The picture of the artist may not be true to nature, as a photograph is; but herein lies its superiority. It is true to the artist's conception, which is nature plus genius, and which is just the difference between *choosing* a picture and *making* one.

In reading over Mr. Robinson's paper, one is strongly tempted to discover the absurdities as they come, line after line; but as I have only my own affair to settle with him, I take his next quotation. "The latest of the many attempts to define art is a very remarkable one," says Mr. Robinson. It is said to be "the apparent disproportion between the means employed and the end obtained."

If Mr. Robinson has read my paper carefully (which I certainly doubt), he will find that this is the definition of *art*, as distinguished from *fine art*, and must be sufficiently comprehensive to include every kind of art whatever. It is waste of time to try to determine what *fine* art is until the broader and more comprehensive term of art itself is determined. Mr. Robinson thinks that "individuality" is art. Individuality is an *accident* of art (to come back to the stumbling block of accident), but is not art itself.

If *individuality* be art, there cannot be much or little of it; whereas everybody recognises *degrees* of art. Let us take a case in point. I am shown a painting, and in it see much that suggests the hand of Turner; but there is a doubt. Again, I see another painting, and am more convinced than before that this is by Turner. A third picture is shown me, and this time I have no doubt whatever. Am I to understand that, as there was more and more of the Turner *individuality* in each successive picture, that therefore there was more and more of *art*? If my idea of art is to make the practical photographer smile, surely this will make the whole common-sense world smile. It surely does not require a genius to see that a man's individuality at one period of his life is not the individuality of another, and that, in some cases, the individuality grows at the *cost* of art, and mannerism is the result.

Not only is *individuality* not art, it is opposed to it, as a moment's consideration will show. According to Mr. Robinson, the more of the man you have in his work, the more of art. I think most of us have seen many instances where the *less* of a man we had, the more art. Apply the same test to my definition, throw overboard the individuality test of Mr. H. P. Robinson, and let us have in again the three paintings. I take the first, and note that, to get a certain effect, much work has been expended; the artist is a beginner. I take the second, and find that the same effect has been produced with half the labour; the *art* is doubled. And I take the third painting, and find that with still less labour the very same effect has been produced; here, again, I say we have still greater art. Now, a moment's consideration will show that, the end in each case being the same, the greater merit lay in the reduction of the labour to produce it; in other words, the apparent disproportion between the end obtained and the means used.

It has been well said that the highest art is to conceal art. If Mr. Robinson's idea be the correct one, and individuality be the prime factor in art, the very reverse would be the case; for *individuality* is not to conceal, but to reveal. Art (not works of art, nor works of fine art, but art in essence) is the faculty of producing the greatest effect by the simplest means; in other words, "the apparent disproportion between the means employed and the end obtained." Many people confound art with æsthetics. Art has no special connexion with beauty or taste, or, for that matter of it, with either soul or conscience, as Mr. H. P. Robinson thinks. *Fine art*, an entirely different subject, is certainly most intimately connected with the emotions, although Mr. H. P. Robinson does not seem to appreciate any distinction whatever between art and fine art, but classes in his definition of art such widely diverging arts as pugilism and painting, evidence surely of an unthinking mind.

A somewhat long quotation from my paper on the relation of photography to art (not fine art) requires a few words. I deny that art, to any great extent, enters into the photographic processes which go to produce a picture. Mr. Robinson affirms that it does. We may narrow the discussion on this point to one of exposure and development, as a very few have to do with the plate in its manufacture. And, first, as to its exposure. The photographer has in his exposure to consider three things. First, "composition or effect;" second, the allowances which he must make for the shortcomings of the photographic process; and, thirdly, the duration of exposure.

As to the first, I deny that it is *art*, and affirm that it is intuition. Artists, like poets, are born, not made.

It is in the selection of his subjects and his treatment of them that the photographer can show the stuff he is made of, and I have never denied this. So far as the selection of his subject and the treatment of it is concerned, he is on a par with the artist; but the picture is not a work of fine art for all that. It is, if I may be allowed to coin an expression, "a work of fine intuition." It is a measure of a man's emotional character, that must be admitted, but a measure made manifest chiefly through *science*, not *art*.

Under the second head the photographer must by *art* determine the alteration in his composition brought about by the shortcomings of photography. I allow art here; it is not a matter of intuition. He must learn by experience what allowances he has to make on his compositions for the shortcomings of photography and *art* is necessary to make up for them. Either he employs legitimate *photographic* art, as by modifying exposure, or development, or both, or he may employ what may be termed non-photographic art, such as retonching the negative. This latter method, not being a photographic process, requires no consideration at our hands, and, of course, it cannot affect the question of whether or no photography is one of the fine arts. To this extent, then, I admit *art*.

With regard to the *duration* of exposure, this is generally a matter of art, but need not always be. We may have no certain means now of conveniently determining the exact period of exposure, but undoubtedly it is a calculable problem, the data being already to hand.

With regard to development, every day seems to make it more certain that it is just what I contended—a chemical experiment, scientifically interesting, but devoid of art. Having, at considerable length, discussed the question of art, it is, in my estimation, not a difficult thing to determine the meaning of the expression "fine arts."

By common consent, the *fine arts* are those *arts* dedicated to the expression of the emotions. It may be the expression of beauty or ugliness, joy or sorrow, but the expression must be through *art* (the prerogative of intelligent creatures), and not through science.

I have only this more to say to Mr. Robinson. I am not a scientist, but (if anything) a practical photographer, actively and uninterruptedly engaged in the pleasant pastime now for more than twenty years.

J. K. Tulloch, M.B.

THE PREVENTION OF HALATION.

The subject of halation, though an ever-present one, does not occupy so much space in the journals as one would be inclined to expect. No doubt workers have been able to overcome much of the trouble incidental to the exposure of gelatine plates on *interiors;* also, undoubtedly, our studio and landscape examples have reached a very high point of excellence—this, it must be remembered, with the means at our present disposal. The introduction of a new plate, designed specially for the prevention of halation, would go to prove this bugbear to be lively as ever, while the following remark in a semi-editorial *critique* of a new lens of wide angle, with more than the ordinary wide aperture, to the effect that "this means shorter exposure (interiors), and consequently less danger of halation," appears to me to denote a doubtful knowledge of this trouble, not so much as to its *cause* but its *prevention*. The cause has been demonstrated frequently and fully. It is only by experience we discover a preventive.

In order to photograph interiors with a fair amount of certainty, (1) the light must be suitable, *no* sunlight preferably; dull, foggy even, provided the interior be free from fog; or rainy weather. (2) A good brand of dry plate; a plate easily worked outside, giving density, one which will bear forcing—a plate, in short, which contains a fairly thick stratum of emulsion. (3) *Backed* plates; the backing brown, dense yellow, or black paper, blacking, Japan black, or, what I invariably use, equal parts of collodion and matt varnish in which has been dissolved a good proportion of rose aniline. This liquid is poured on and off the *back* of the plate, previously cleaned; it dries quickly, with a dead matt surface, and is easily removed prior to development. (4) Plenty of exposure; where one works by tables, always give at least three times the exposure prescribed.

It is quite certain that many interiors, even those most prone to give halation, may be successfully photographed every time with ordinary plates well backed, *provided the light be right*. One interior I have in mind is a case in point. A large bank office, some thirty yards square, windows all along the front, facing the street; at the back light has access only through a conservatory, occupying one-third of the space. The windows are ordinary plate, marble columns, beautifully ornate and coloured ceiling, and fine oak carvings. The morning chosen for this order turned out even better than was hoped for; a dull, dreary morning, raining incessantly, barely enough light to focus by. The conservatory, where halation was most to be feared, was illuminated by what appeared to be practically yellow light, from the atmospheric conditions prevailing outside; and this was a bit of good fortune not anticipated. An exposure of four hours was given—ten o'clock till after dinner; and the resulting negative was a complete success, no trace whatever of halation. It must be obvious this portion of the interior would have received considerably more exposure than absolutely necessary; I am inclined to think that an alternating negative and positive process goes on in such cases. Other subjects to be successfully photographed under similar conditions of atmosphere are showrooms, structures lighted from the top and sides, workshops, conservatories, winter gardens, and the like.

A troublesome interior was the private chapel of a well-known Bishop; the place was incomplete at the time, the windows being temporarily glazed with ground glass; the east window commenced immediately above the reredos, the latter, a beautiful gilded and coloured work of art; following the rule of a dull day and prolonged exposure, a negative was secured which, with regard to the windows, was all right, but the altar-screen had suffered, and, in order to secure a satisfactory result, two negatives were taken on a subsequent occasion—one in the usual way, the second from exactly the same standpoint, but, by carrying forward a tunnel-shaped shade from the camera front, particularly at the top, much more detail was visible, and, in fact, the window could be blocked or screened out altogether. double printing was necessary, but I don't think this subject could have been secured any other way.

Some church interiors are very badly lighted. Stained-glass windows here and there; occasionally, to throw a little light into the roof, some rabbit-hutch-like windows will have been inserted up aloft. The place will be full of harsh contrasts. What is the best remedy? Simply prolonged exposures. One need not be deterred, even though sunlight be streaming through the windows; a short exposure here will be fatal—give plenty, and the result will be pleasing.

We must all welcome any improvement in dry-plate making, though many of us are inclined to ask, What is the matter with the old ones? Given a little more "body," they are as good as need be. Plates were coated more liberally before the advent of high-class machinery; the makers are "a bit too canny" with their emulsions nowadays, and there can be no doubt whatever that the film must be fairly thick to be at its best. Apart from this, plates have arrived at a very high standard, and in practised hands are capable of the most satisfactory work. In conclusion, I am pretty certain that the great majority of failures through halation are simply failures on account of (considerable) *under*-exposure.

J. Pike.

HINTS ON MOUNTING PHOTOGRAPHS.

[Anthony's Bulletin.]

In this article we have endeavoured to give a few of the most important points of manipulation in connection with mounting photographs, deeming that they might prove useful to some of the younger of our photographic brethren.

From among the various pastes and mounting preparations it is necessary to select the one best suited to our needs. For prints having a decided and seemingly irremediable tendency to curl when moistened, it is advisable to use a paste of considerable tenacity, as otherwise the tedious and unpleasant operation of "licking" down the corners and edges will have to be resorted to.

There are two golden rules in selecting a mountant that should always be remembered. First, to have the mounting medium fresh, and not in a state of partial decomposition. Want of care in this direction has materially hastened the fading of many a print. And, second, to employ such a one as will not readily take up moisture from the atmosphere after being once used. Glue and gelatine are both somewhat open to this objection, but the employment of a very thin layer partially does away with the objection in these two cases, while, for some operations, gelatine itself is well-nigh indispensable. Thus we prove our second golden rule by quoting immediately after it the exception: the first one should admit of no exception or deviation.

To prepare the glue, break it up into small pieces and half fill the glue pot with it, which should be placed in a second pot filled with boiling water. Add a little cold water to the pot containing the glue, and place both on the fire. In a short time the glue will be melted; stir it up with a stick, when it should be of a thin watery consistence and just tacky when put between the finger and thumb. If too thick, add a little more water; if too thin, a little more glue. This mountant must be used hot, and it is best to keep it immersed in its jacket of boiling water during the operation of mounting.

To make the gelatine paste, soak two ounces of soft gelatine in cold water, and then pour on sufficient boiling water to make a rather

thick solution. When solution is complete, strain through muslin nto any convenient receptacle. When using, heat by standing the vessel containing it in hot water for a short time.

Starch paste we believe to be ordinarily the best of mountants, and it is best prepared fresh as needed. A teaspoonful of the starch should be thoroughly wetted and stirred in a small saucepan with cold water, any lumps which may form being broken up until the mass resembles a cream; this is then poured into a half pint of boiling water, stirring constantly while adding. Allow to cool and strain through muslin. If it is desired to keep this for any length of time, a pinch of salicylic acid should be added to the boiling water and stirred until dissolved before adding the starch.

To prepare the prints for mounting it is necessary to first trim them. For this it is convenient to have a glass form of the desired size. These can be readily obtained of the dealers and insure square corners and uniformity among your trimmed prints. A cheap knife such as is used in the kitchen for paring potatoes, and a rough sandstone are necessary adjuncts.

Lay the print down on a sheet of heavy glass, place over it the glass form, and trim with the before-mentioned potato knife; the rough sandstone readily gives a sharp, somewhat serrated edge, admirably adapted for this purpose, and a quick movement of the knife produces a clean, sharp cut with no ragged edges. Care should be taken to hold the glass form firmly upon the paper while trimming as an additional precaution against tearing.

The prints should next be thrown into water, and thoroughly soaked, and then laid face down—one on top of the other—on a sheet of glass; much of the superfluous moisture can be removed by pressing down on the pile with the hand, and allowing the water thus squeezed out to run off by tilting up the glass.

If this is not sufficient, lay a clean towel over the back of the print just before applying the paste, and smooth it down; this will leave the surface only slightly damp, and in excellent condition to receive the paste, which should be applied with a wide flat brush, in a thin, even coating, taking care that no lumps are left on the print before applying it to the mount, and that the edges and corners are well covered. In this way no paste is distributed on the face of the print, where it otherwise has an unpleasant habit of getting, and the whole operation can easily be conducted without any of the inevitable "mess" which so often unnecessarily follows many of our photographic operations.

Having applied the paste, insert the point of the knife under one corner of the print, gently raise it, and take hold of the print by the thumb and forefinger of each hand by the diagonally opposite corners. Care should be taken to grasp the print at some distance from the edges, to avoid removing the paste from them with the fingers, and having them curl up when dry. Touching the paste brush lightly with those fingers coming in contact with the pasted side of the print, is also a good precaution to take for the same reason. In taking hold of the print, the thumb should be inserted under the picture side, when it is very easy to reverse its position, and bring it to the proper one for applying it to the mount.

By a little practice you can hold the print in this way so as to almost let the two free corners touch the mount, and the proper placing can in this way be readily judged without the use of a mounting board.

In lowering the print upon the mount, let the diagonal passing through the two free corners first touch, and then gently and gradually lower the other two corners. The print will now lie flat and even upon the mount without any air bubbles making their appearance. It is next to be squeegeed down, and any paste exuding from the corners to be at once removed with a clean towel.

In the absence of a squeegee, a towel laid upon the face of the print and carefully rubbed down with the fingers from the centre to the edges of the print will answer every purpose.

When dry the edges should be examined, and if they show any sign of curling, an ivory paper cutter should be carefully inserted and the edges of the picture slightly detached from the mount. In the opening thus formed a feather will be found very convenient to apply the paste with.

In some extreme cases it will be found necessary to dry the prints between towels under pressure of a pile of books or a letter-press, to prevent the curling up of the edges.

Too hard a pressure on the squeegee will sometimes squeeze out too much of the paste and cause the above-mentioned difficulty.

Blotters are not to be recommended for drying prints, as they are liable to leave "fluffs" over the surface, which, when dry, are difficult to remove.

Sometimes the prints are mounted face side down upon glass, and the finished picture viewed through the glass. In the case of bromide and chloride prints it is only necessary to squeegee the print, face downwards, upon a perfectly clean sheet of glass and allow it to dry. With albumen prints it is necessary to give the glass and print a coating of the warm gelatine solution mentioned in the first portion of this article. Lay it on one side to set, and subsequently clean the glass with a clean sponge dipped in hot water, but do not touch the print itself.

A picture of this kind can be backed with rough drawing-paper, which will appear as a mat, and the whole may be bound to another piece of glass, similar to the method employed in mounting lantern slides. This is an excellent way of using up spoilt negatives, and a most effective and permanent method of mounting.

Select your mounts with special reference to the subject, and give them plenty of margin, as it will greatly enhance the beauty of your picture. How many of us have seen an otherwise excellent and attractive print marred, if not totally ruined, by an inappropriate setting?

NOTES ON STAR PHOTOGRAPHY.

[Science.]

An announcement has recently appeared to the effect that the French astronomers have begun to doubt the value of negatives of stellar bodies taken on orthochromatic plates, because the stellar discs are surrounded by a strong aureola, due to the aberration of the red rays of the objective. For this reason the permanent committee on the chart of the heavens has decided to exclude orthochromatic plates for such work.

I presume every one finds some satisfaction in saying, "I told you so." The announcement leads me to publish now an article on this subject which was written in Japan between four and five years ago. It was perfectly clear to me, at that time, that colour-sensitive plates were being used in astronomical work when the very opposite kind of plates would have been much better for the purpose. Instead of extending the sensitiveness, it should have been restricted as much as possible. My article was not published because I deemed the facts too obvious to require discussion. But, since M. Léon Vidal, Editor of *Le Moniteur de la Photographie*, has taken, as I believe, an erroneous view of the matter in opposition to the practical results of the astronomers, I have looked up my old MS., and publish it herewith without change.

I would add, that the opinion then expressed as regards the future of collodion plates for all scientific work has been greatly strengthened by the results of later investigations.

The article referred to is as follows:—

The so-called isochromatic, or orthochromatic, sensitive plates have been recommended for use in astronomical photography, in order to obtain impressions of red or yellow stars along with those having more blue and violet light in their radiations. Spectroscopic observations have shown that the light of different stars differs very much in the proportion of highly refrangible rays, and this difference must be of great influence in determining their photographic action. The ordinary sensitive gelatine plates possess a maximum of sensitiveness near the Fraunhofer line H; but some action can be traced into the yellow, as the result of very long exposure, or even still further. For ordinary purposes, however, we may consider that the action does not pass the blue, particularly when photographing bright sources of light, such as the stars, because the more refrangible rays are so very much more powerful in their effect upon the plate that they exert their full action before the others can make a visible impression. To extend the time beyond that point would result in a reversal of the effect sought for, a change in the character of the negative, and serious irradiation or spreading of the light around the image, resulting in impaired definition. With ordinary sensitive plates, therefore, the images we photograph are images made with blue, violet, and ultra-violet rays, covering, indeed, a considerable range in the spectrum, but excluding a large and important portion of it.

The differences in the character of star radiations are so considerable that the blue is sometimes very strong and brilliant, even exceeding that of the sun relatively to the other parts of the spectrum, as we find it in *a* Lyræ and in Sirius; while in other stars the temperature is so low that there is scarcely any blue, and line-absorption gives place to flutings, or even to the bright lines of incandescence from comets and nebulæ. It is obvious, therefore, that one star not only differs from another in glory, as seen by the eye, but the photographic plate, which takes no account of any colours beyond its limited range of sensitiveness, tends to exaggerate the difference, and give utterly false evidence of relative brightness. For a red star may appear very bright to the eye, while its image on the plate would be very faint, or perhaps scarcely discernible.

With orthochromatic plates the result will be different, provided the telescope itself is not at fault. We will assume for the moment that the

telescope is so constructed that the "chemical" and visual foci exactly coincide, and that the plates are equally sensitive to all the colours of the spectrum. Then the negative will show exactly what is seen by the eye, and these are the only conditions under which such a result can be perfectly attained.

Doubtless such perfectly corrected telescopes, or perhaps I should say such as are so corrected within the limits of the optician's skill, are rarely available, and a very usual plan is to make certain corrections for ordinary telescopes to adapt them to photographic work. The effect of these corrections now deserves consideration.

The difference between the so-called "chemical" focus and the visual focus of a telescope may be little, or it may be half an inch. In either case the photographed image will be decidedly out of focus if allowance for this difference be not very carefully made. The usual means of doing this is to change the position of the plate-holder, and find the place of the sharpest definition by trials. By properly arranging the ground glass and the plate-holder, the plate will always be in focus for the actinic rays when the image appears sharp on the ground glass.

Having accomplished this result, we have succeeded in doing precisely what we do not wish to do, viz., instead of arranging the instrument to photograph what the eye can see, by means of the extended and uniform sensitiveness of an orthochromatic plate, we have arranged it to define only with blue or violet rays, and have restricted its range to stars that are specially characterised by highly refrangible radiations, effectually cutting off the red and yellow stars, and rendering the use of orthochromatic plates not only useless but positively objectionable.

As regards the red and yellow stars, the greater portion of their light will be brought to a focus at the point of distinct vision, not on the sensitive plate, and, the feeble radiations of higher refrangibility being too weak to act strongly on the plate, such stars will be but faintly shown in the negative. The rays not focussed on the plate will tend to blur the images, and this effect will be more pronounced and objectionable in proportion as the range of sensitiveness of the plate to the different parts of the spectrum is increased. For this reason the most perfect pictures would be produced, under the conditions described, by using plates sensitive only to the particular rays that form the image on the plate, or else by cutting off the other rays by a screen, thus working with monochromatic light.

It is possible that there may be some object in photographing stars with the different colours of the spectrum separately, in which case orthochromatic plates can be so prepared that they will select the particular light required, and such observations may be made with ordinary telescopes, correcting them for each set of rays in turn, in the manner described. But, if I correctly understand the purpose of photographic star-maps, they are intended not only to represent the distribution of stars and their relative positions, but also to show their respective brightness, or, as we usually call it, magnitudes. Now, magnitude measured by brightness is not the same as the photographic action of the stars upon a plate of restricted spectrum sensitiveness, such as all ordinary sensitive plates, and this, although a self-evident proposition, has not received in practice the attention it deserves. On the other hand, orthochromatic plates will give perfectly truthful representations of the starry heavens when used with perfectly corrected telescopes, as already explained, and that they will only do so under such conditions is, I believe, obvious.

If it is possible to make plates of uniform sensitiveness as regards tests in the sensitometer, and also as regards all the rays of the visible spectrum, and if such plates can be produced regularly in large quantities, we may consider the problem of photographing the stars to be satisfactorily solved. But much yet remains to be done before a plate that can be regarded as standard can be adopted. The composition of the emulsion, the manner of rendering it sensitive, the means of testing the plates, including the standard of light to be used in the process, and the keeping qualities of the plates, must all be thoroughly investigated before it will be safe to adopt a standard plate for universal use. Nevertheless, we are in a position now to begin practical work, and the results will be of permanent value if we act upon the proposition that with orthochromatic plates there is no distinction of chemical and visual rays, and that such plates can only be advantageously employed when all the rays from red to ultra-violet are brought to a focus in a single plane.

I do not venture upon any speculations as to the probably best method of preparing colour-sensitive plates for astronomical work, for the reason that new methods are constantly being tried. I will say, however, that I deem it not at all improbable that collodion will be found superior to gelatine as a vehicle for the emulsion, and, although the gelatine plates are at present more rapid than collodion emulsion plates, there is no obvious reason for this, further that than we do not yet know how to make extremely rapid plates with collodion. But there are some objections to gelatine, and none to collodion. Gelatine swells in water, particularly in warm climates, and, although this defect can be to some extent controlled, it is really at times a serious trouble, which no "tropical" plates can entirely overcome without a sacrifice of other good qualities.

The great point in favour of collodion is that it seems to lend itself peculiarly well to the production of colour-sensitive plates, and this, coupled with the uniformity of the material that can, by proper means, be secured, and the clearness with which it works, leads me to anticipate that it will eventually rival gelatine for fine, delicate work, and I believe it will come to be highly favoured in astronomical work and spectrographic work.

ROMYN HITCHCOCK.

LANDSCAPE PHOTOGRAPHY WITH ORTHOCHROMATIC FILMS.

[American Amateur Photographer.]

DURING the past few years, in a rather extended experience abroad, I have made extensive use of orthochromatised emulsions coated on celluloid films; a few notes, therefore, concerning the practical details connected with their use may be of value. It may be stated in advance that the deductions given in this paper are based upon some eleven hundred exposures made in Southern Germany, Switzerland, and Italy, during the summer of 1890, and in Norway during the summer of 1891. These were made under the most varying conditions of light, and embraced every variety of landscape usually attempted by the average photographer. No "snap-work" or instantaneous exposures were made on orthochromatic films.

ORTHOCHROMATISM.

It is hardly necessary at this late day for me to go into any lengthy dissertation upon the subject of othochromatism, or to attempt to explain at length what is meant by the term, for the value of plates prepared in this manner is now well recognised, and the whole theory has been repeatedly and in detail described at different times in numerous photographic publications. Suffice it to say that a plate or film coated with an orthochromatised emulsion displays certain peculiar characteristics in regard to light and to the various component coloured rays of the spectrum. An ordinary photographic emulsion is always actively affected by the blue rays of the spectrum, while it is almost equally indifferent and insensitive to the action of the yellow, orange, red, and green rays. The consequence is, that in photographing a landscape blue appears as white, while the greens, reds, and yellows, although to the eye markedly different in colour-tone or gradation, produce practically the same effect upon the photographic emulsion, and are all represented in the finished positive as blacks of about the same colour gradation. The orthochromatic emulsion, on the contrary, while less sensitive to blue as the plain emulsion, is more sensitive to the yellows, greens, and reds, and in much more correct relation to their colour intensity. Colour values are, therefore, more correctly rendered, and this rendition is made even more perfect by the interposition of a yellow screen between, before, or behind the lens combination used. This acts as a light strainer or filter, so to speak, filtering out and holding back the blue and violet rays of the spectrum, and allowing the yellows, greens, and reds, in which the luminous vibrations are slower and of less intensity, an opportunity to act fully upon the emulsion. It may also be noted that with an ordinary emulsion the colours blue and white affect it equally, so that, for example, in photographing a lady dressed in blue and white, the finished positive would represent her as in white entirely. In landscape photography this is a great drawback, for when, for instance, making an exposure upon a snow-capped mountain standing out against a blue sky, the two act so equally upon the emulsion that in the positive it is often almost impossible to note where the line of demarcation exists between the two, the whole being rendered as an unmeaning mass of white, instead of showing the brilliant and clear contrast between the two that there is in nature. With an orthochromatised emulsion, however, the result is quite different—blue appears darker than white, as, in fact, it does naturally to the eye; and this effect is brought out even more prominently by the employment of the yellow colour-screen. This holds back the action of the blue rays, and also gives the darker tints in the nearer foreground the opportunity to properly impress the plate.

WHY ORTHOCHROMATIC PLATES ARE USEFUL.

Now, with the above points clearly understood, we can appreciate why the orthochromatic plate or film should be so useful in landscape photography.

First. The different shades of green in grass and foliage, ranging often from a light yellowish green to a shade so dark as to be almost

black, all have their proper effect upon the plate, and the resulting positive shows them with their proper colour values as expressed in black and white. There is hence much brilliancy and gradation of tone obtained.

Second. As the orthochromatic emulsion differentiates between blue and white, delicate cloud effects are obtained which would be utterly lost with an ordinary emulsion. I have often been asked how I obtained the realistic cloud effects which I have shown in some of my Swiss photographs and lantern slides, and, in fact, have sometimes been asked if they were not "printed in;" but, thanks to orthochromatic films, no such procedure has been necessary, for the clouds are "right there" in the original negative.

Third. In large and extended landscapes involving considerable distances, an orthochromatic emulsion used with a colour screen is almost an absolute necessity. Otherwise the blue rays from the more distant portions of the landscape would utterly "burn out" their particular part of the plate before the foreground had been fully exposed. All sorts of devices have been suggested to overcome this difficulty—sky shades, shutters exposing from the bottom upward, &c., &c., but none have met with sufficient success to warrant their adoption. With a good orthochromatic plate of moderate rapidity, or an orthochromatic celluloid film, which is even better, owing to absence of halation, and a yellow colour screen of moderate depth of colour, all these difficulties are avoided, and a satisfactory result can nearly always be obtained. I have grown to depend upon this method of procedure so much that I think nothing of attempting a landscape where a distance of some forty of fifty miles is involved, and can usually obtain in my picture as much, if not more, than I can see with my eye. I can obtain, too, a picture with harmonious gradation, a fully exposed and satisfactory foreground, full of light and shade and plenty of detail, while the middle distance and extreme distance show both detail, atmospheric effect, and good tone gradation. Furthermore, if there are clouds, I am *sure* to get them, and, excepting there be sufficient wind to cause their outlines to be blurred by movement during a long exposure, the result leaves nothing to be desired. I have one negative, a view taken from the top of the Furca l'ass, in Switzerland, in which, while the foreground is well exposed and satisfactory, the Alps of the Monte Rosa and Mont Blanc groups are clearly visible, although nearly a hundred miles distant. It would be wholly impossible to obtain such a result with an ordinary emulsion.

Fourth. Effects of sky and water, reflections of clouds in the water, snow-capped peaks and glaciers standing out against a blue sky. Autumn changes of foliage, &c., &c., with an orthochromatic emulsion, are rendered with a fidelity impossible to obtain with the ordinary plate.

Orthochromatic Films.

I have thus far used the term plate in a general sense, meaning either glass or celluloid. While there is no doubt that for perfection of image and freedom from defect the glass support is as yet the best, there is no doubt, too, that there is a certain amount of halation accompanying the use of glass, which is often a serious objection to its use, particularly in landscape work. The celluloid film, however, owing to its thinness, is almost free from this objection, and, could it be obtained as free from defects as is the glass now in use by our best dry-plate makers, nothing better for photographic purposes could be desired, for its small weight, when compared with glass, gives it an immense advantage, especially when on a lengthened tour. Unfortunately, however, the celluloid of to-day is not yet as perfect as glass, and there is still room for considerable improvements in the methods of manufacture, although the character of the celluloid film now supplied is far superior to those of a few years back, when the large majority of negatives made on them were as full of spots as a coach dog. Although I have many very good negatives made on celluloid films, there is a considerable percentage where the defects of the celluloid are such as to preclude the negative from being used for purposes of enlargement. However, from samples which I have examined from time to time, I feel satisfied that the manufacture of celluloid sheets for photographic purposes is rapidly progressing towards perfection, and I do not think we shall have to wait very many years before it will be as cheap and as perfect as glass. Most of the coated celluloid films in cut sheets furnished within the past two years have been with a matt surface on one side and a smooth surface on the other, the emulsion being coated on one or the other side, according to the preference of the manufacturer. Those which I have used were coated on the smooth side. The matt-surface back is supposed to diminish the amount of halation, and also afforded a good and convenient ground for retouching. There is, and has been for some time past, a question in my mind, however, as to whether the matt or ground-glass surface does not to a certain extent interfere with the free transmission of light through the negative when printing, and so tend to diminish the brilliancy of the print, and therefore whether light would not pass more rapidly and actively through the clear glass of the shadows in a glass negative, and hence produce more dense and brilliant blacks. This applies more especially to plain silver and platinotype prints, where the tendency of the process is always to reduce contrast. I have heretofore used the matt-surface celluloid film exclusively. I think that with my next photographic expedition I shall make extended trial of celluloid without the matt surface, and which, being quite clear, is more of the character of a glass plate. I have made several experiments lately in comparing a smooth, clear celluloid film with one having a matt surface, the test being an exposure in an ordinary room, the lens being pointed directly at a well-lighted window, and the amount of halation resulting on each plate carefully compared. While my experiments have not been extended enough to warrant positive conclusions being drawn, the result has so far been quite sufficient to satisfy me there is no material advantage in the use of the matt-surface film, and in other respects it is not as perfect as the smooth-surface film, owing to its greater liability to show scratches.

Exposure.

And now for a few words regarding films and exposures. Up to this time I have used mainly the orthochromatic celluloid films prepared by John Carbutt, and his emulsions have always given me such satisfactory results that I can unhesitatingly recommend them. For landscape work I prefer a rather slow emulsion—not slower than twenty-three or faster than twenty-five (Carbutt sensitometer). But there is one vital principle never to be forgotten in the exposure of *all* orthochromatic emulsions. They must *always* be fully timed. An under-exposed orthochromatic plate or film is much more harsh and lacking in detail than an ordinary plate of the same speed would be when exposed under precisely similar circumstances. On the other hand, the orthochromatic plate, and even more so the film, will bear an amount of overtiming which would be simply ruinous to the ordinary plate. The matter of timing an exposure is one involving so many factors, all of which constantly vary, that it is almost impossible to lay down any positive dictum. But my own experience has been that with a film of twenty-three sensitomer (Carbutt's) and a good, rapid rectilinear lens at *f*-32, the exposure of five seconds on an ordinary sun-lighted landscape, with no special distance or deep shadows, would generally give me satisfactory results. Where a colour screen is used this exposure should be increased from five to twelve times, depending largely upon the depth of shadows in the subject.

The Colour Screen and its Preparation.

The colour screen for landscape work should be of a slight canary-yellow, and special care should be taken not to have it of too deep a tint, otherwise it will cut out too much of the blue rays, and a harsh negative, lacking in tone gradation, will result, while it will be necessary even then to make a much longer exposure than mentioned above. I have always prepared my own colour screens, using the following method. It is first necessary to procure glass perfectly flat and free from all striæ or bubbles, or, when placed before or behind the lens, its unequal density will refract the rays of light and thus distort the image. This is a *sine quâ non*. Thin plate glass that is used for the purpose of making colour cells, and animalculæ tanks, for demonstration with the gas microscope, is the best article for the purpose. After being cut in squares of the size desired, a square should be flowed on one side with a solution of a yellow aniline dye in celluloid varnish, using from five to eight grains of the dye to the fluid ounce of varnish, according to the depth of colour desired. I am in the habit of using a dye called "golden yellow," which is freely soluble in alcohol. The celluloid varnish is known in trade by a number of different fictitious names, such as "enameline," &c., &c. It is simply a solution of celluloid in mixtures of amyl acetate, petroleum benzine, alcohol and ether, mixed in varying proportions. It can be easily prepared on a small scale by cleaning off the emulsion from a spoiled celluloid film, cutting the film up in small strips, and dissolving these in a bottle in a mixture of one part (by measure) of amyl acetate, one part petroleum benzine, three parts alcohol and three parts of ether. The celluloid swells up and dissolves rather slowly, hence the bottle containing the mixture should be well shaken at intervals for several days. When the celluloid is all dissolved the liquid should be filtered through a little absorbent cotton to remove any loose flecks of dirt. This varnish gives a tough film, clear and free from transverse striæ, and is an excellent material for varnishing glass negatives or positives, being perfectly waterproof. To resume: The glass square, after having been flowed with the coloured varnish, in the same manner as when coating a plate with collodion, is allowed to "set" for a few moments, and then placed aside on a flat

surface until the varnish is perfectly hard and dry. Care must be taken to keep it covered while drying, so as to avoid dirt and dust settling on it. The coated plate is now placed on a level surface, film upward, and sufficient pure Canada balsam (white and free from dirt) poured on the plate to make a pool in the middle of the plate about one-fourth of its area. A fresh, clean glass square of the same size is next taken and gently lowered on the balsam and plate in the same manner that a cover glass is placed over a microscopic object, and then a gentle and even pressure exerted until all air is forced out, and the two glass surfaces are cemented together with the balsam and are in uniform contact. The cemented plates are now laid aside on a level surface and allowed to remain several weeks undisturbed until the balsam has thoroughly hardened. Then the edges are cleaned off, the exuded balsam being removed with a little benzine or benzole, and the edges bound with some strips of lantern-slide paper. This colour screen can be placed either before or behind the lens. If before, a special hood must be made to hold it. I therefore prefer to use it behind the lens, on the inside of the lens board, where it can be placed or removed in a few seconds. This can easily be arranged by having two small brass or wooden cleats made of this shape.

The edge is fastened down on the inside face of the lens board by means of a few small screws, and the colour screen will then slide easily up and down between the cleats.

A small sprig nail placed at the bottom acts as a stop, and prevents the colour screen from slipping down and out.

Orthochromatic Plates in Dull Weather.

One more point may be noted in regard to exposure. The *data* previously given were all based upon a clear, bright, sunshiny day being taken. But suppose the day to be overcast and cloudy. Under such circumstances the exposure on orthochromatic plates must be greatly lengthened, much more so than for ordinary plates under the same circumstances. For instance, if I gave twice or three times as much exposure on an overcast day (using an ordinary plate) as I would on a clear day, for an orthochromatic plate I should give from four to eight times as long, and if I did not do so I should have an undertimed plate. Most of my failures with orthochromatic films have been from this cause—undertiming on cloudy days. There seems, under these circumstances, to be an absence of certain light rays which affect quickly the orthochromatic emulsion. A very much longer exposure must be made to secure good results. I have frequently, after I discovered this, after making an exposure, made a duplicate in which I doubled the exposure, and almost invariably the longer-timed negative came out the best.

And now a few words in conclusion regarding development. Pyro, eikonogen, hydroquinone all give good results, depending upon the predilection and skill of the operator. I am inclined to favour the mixed developer of hydroquinone and eikonogen. With it I can secure fine detail and get also plenty of density when desired, and I think the combination particularly suited to orthochromatic emulsions.

Charles L. Mitchell, M.D.

Our Editorial Table.

The Amateur Photographer's Annual for 1892.

Hazell, Watson, & Viney, Limited.

To say that this volume is in every way an advance upon that of the previous year would be saying but little, for there is really no comparison between them. It does not bear any name as that of editor, although we may guess who he is. He has given an excellent summary of "Progress in Photographic Science in 1891," culled from various sources, all of which are acknowledged. In addition to this, we have two exhaustive essays, respectively, on "Architectural Photography," by Rev. T. Perkins, M.A., and "The Form and Composition of Landscape Photography," by Rev. F. C. Lambert, M.A., both of which are illustrated from negatives by their authors. It also contains a "Holiday Guide for Photographers," with a list of the dark rooms and dealers, where any, in the places mentioned, a feature that will prove attractive to many. The article on "Apparatus" is obviously a reproduction of the price-lists of certain dealers. The illustrations are numerous, and embrace one bromide print, one silver print, five collotypes, and several from process blocks. It is well got up. Price 2*s*.

Photographic Lenses and Sundries.

By Taylor, Taylor, & Hobson, Leicester.

This elegant booklet is something more than a mere catalogue of the firm's productions, for it also contains useful information relating to the principles of a lens's action, the standards of the Photographic Society of Great Britain for screw fittings and the preservation of lenses. We need scarcely add that it contains a full account of the lenses and other articles manufactured by the firm.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
August 8	Darlington	Trevelyan Hotel, Darlington.
,, 8	Dundee Amateur	Asso. Studio, Nethergate, Dundee
,, 8	North Middlesex	Jubilee Hall, Hornsey-road, N.
,, 9	Derby	Smith's Restaurant, Victoria-st.
,, 9	Manchester Amateur	Lecture Hall, Athenæum.
,, 9	Stockton	Masonic Court, High-street.
,, 10	Leicester and Leicestershire	Mayor's Parlour, Old Town Hall.
,, 10	Munster	School of Art, Nelson-place, Cork.
,, 10	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 10	Reading	
,, 10	Stockport	Mechanics' Institute, Stockport.
,, 11	Birkenhead Photo. Association	Association Rooms, Price-street.
,, 11	Bradford Photo. Society	50, Godwin-street, Bradford.
,, 11	Hackney	Morley Hall, Triangle, Hackney.
,, 11	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 11	Manchester Photo. Society	36, George-street, Manchester.
,, 11	North Kent	Gravesend.
,, 11	Oldham	The Lyceum, Union-st., Oldham.
,, 12	Cardiff	
,, 12	Holborn	
,, 12	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 12	Maidstone	"The Palace," Maidstone.
,, 12	Richmond	Greyhound Hotel.
,, 12	West London	Chiswick School of Art, Chiswick.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

July 28,—Mr. H. Snowden Ward in the chair.

Mr. G. Ruthven was elected a member.

It was announced that Miss Catharine Weed Barnes and Dr. Charles L. Mitchell had promised to read papers before the Association.

Questions.

A question from the box asked, "What is the meaning of 'cutting the shadows' in a plate?" It appeared that the question referred to an editorial notice of the Barnet plates by a contemporary, in the course of which pyro soda was said to "cut the shadows."

Another question was: "In making gelatine emulsion, what is the best method of adding silver nitrate in order to secure uniformity of the precipitated particles?"

Mr. W. E. Debenham would have gelatine in both solutions.

Mr. G. W. Atkins asked if the silver nitrate would not injure the gelatine?

Mr. Debenham replied that emulsions made that way were very good—Captain Abney recommended it.

Reducing Prints.

Question No. 3: "Please state the best formula for reducing silver prints, both albumen and gelatino-chloride."

Mr. Debenham suggested fresh hypo for albumen prints.

Mr. F. A. Bridge stated that Mr. Dunmore recommended mercury bichloride.

Mr. R. P. Drage mentioned that he had had gelatino-chloride prints dry a rusty black, and that he found a weak solution of mercury bichloride converted them into a mauvish tint. The prints had kept nine months without alteration.

Mr. T. Bolas suggested the use of a weak solution of iodine and hypo.

Mr. Debenham had tried cyanide, and got graininess and a nasty colour.

Mr. E. W. Parfitt had reduced silver chloride prints with Farmer's solution. It had a tendency to attack the half-tones first.

Mr. Drage found that ferridcyanide and hypo would not injure any kind of print.

Flashlight Portrait of Miss Barnes.

The Chairman exhibited a flashlight portrait of Miss Catharine Weed Barnes taken by Mr. Robert Slingsby, of Lincoln. The exposure, with eight lamps, would be about one and a half seconds. All the lamps were placed at the same distance from the sitter, and had reflectors.

Mr. B. Foulkes-Winks exhibited a patent album for holding unmounted prints, which appeared to resemble an ordinary portrait album.

The meeting subsequently adjourned.

Amateur Photographic Association.—A Council Meeting to award the prizes was held on Wednesday, July 27, at 58, Pall Mall, His Highness the Duke of Teck in the chair. The following members were elected:—The Viscount Maitland, Mrs. E. G. Wrigley, Messrs. T. K. Mellor, E. F. Scougal, M.D., A. H. D. Steele,—Craigie, E. Kennard, W. J. Harrison, and Miss E. A. Sykes. Mr. Melhuish, the Hon. Secretary, then laid before the meeting the pictures for the current year, which had been arranged and classified by Mr. Glaisher. There are 152 pictures in Class I, being more "first class" pictures than had been contributed in any previous year. They are as follows:—C. Stephens, 6; Lord de Ros, 2; R. Murray, 9; F. E. Currey, 2; W. S. Hobson, 18; Major Board, 1; General Sladen, 1; R. O. Milne, 18; R. Leventhorpe, 12; M. de Dêchy, 6; W. Gaddum, 3; J. C. Cohen, 6; Colonel Foster, 3; F. G. Smart, 7; the Vicomte de Condeixa, 9; H. O. Hutchinson, 5; F.

Wrigley, 2; Miss Mahon, 3; A. R. Dresser, 9; H. Emmons, 3; E. F. Scougal, M.D., 1; the Viscount Maitland, 8; and W. Jerome Harrison, 18. The rest of the pictures were comprised in Classes 2, 3, and 4. The following prizes were awarded:—First prize to the Vicomte de Condeixa, a large silver goblet, for Nos. 2, 3, 5, 10, and 13; R. O. Milne, a silver goblet, for Nos. 7, 15, 25, 26, and 31; C. Stephens, an album, handsomely bound, for Nos. 67, 69, and 70; M. de Déchy, a large silver medal, for Nos. 1, 3, 5, and 6; A. R. Dresser, an album, handsomely bound, for Nos. 1, 5, 33, and 79; the Viscount Maitland, a medal, for Nos. 2, 8, and 10; W. S. Hobson, a silver goblet, for Nos. 372, 371, and 378; R. Leventhorpe, a picture in frame, for Nos. 223, 224, and 228; W. J. Harrison, a large silver medal, for Nos. 15, 31, 39, 43, and 44; F. G. Smart, an album, handsomely bound, for Nos. 38, 39, and 45; Colonel Foster, a picture in frame, for No. 3; J. C. Cohen, a medal, for Nos. 5, 7, and 8; H. O. Hotchinson, an album, handsomely bound, for Nos. 2 and 5; W. Gaddum, a medal, for No. 178; H. Emmons, a medal, for Nos. 3 and 4; R. Murray, a medal, for Nos. 276 and 284. A vote of thanks was passed to Mr. Glaisher for the time and care he had bestowed on the arrangement and classification of the pictures. The pictures are now on view at the offices of the Society, 53, Pall Mall, opposite Marlborough House.

Liverpool Amateur Photographic Association.—What may be termed the private view of the newly acquired premises of this Association in Eberle-street took place on July 26. The old quarters of the Association in Lord-street, although pleasant enough when reached, were far too small for the growing needs of the Association, and it was decided some time ago to cast about for more convenient rooms. Percy-buildings, Eberle-street, were eventually fixed upon, and the building is now practically divided between the Artists' Club and the Photographic Association. The Association is to be most heartily congratulated alike upon the extent, the comfort, and the artistic beauty of their new abode. The rooms, in which special accommodation has been provided for lady members, are approached from two entrances, and have been decorated throughout with the utmost taste and delicacy. Upon the walls, and crowding every square inch of space, are to be seen some of the finest specimens of the photographic art ever printed. Downstairs, everything has been done to please the eye; upstairs nothing has been left undone to give the members of the Association every opportunity to approach perfection in the developing, the printing, the finishing, and the hundred other practical details which go to make the modern photograph so beautiful a work of art. The visitors to the Association were received by the President, Mr. W. Tomkinson, Mr. Paul Lange, Mr. Woolfall (who has done yeoman service in the fitting up and decoration of the new premises), and other prominent members of the executive. It may be safely said that, with the exception of the Camera Club, in London, no photographic body in the United Kingdom has such commodious and such artistic surroundings as the Liverpool Photographic Association. At the monthly meeting on Thursday, July 28, Mr. B. J. Sayce presided, and there was a large attendance of members. Mr. B. J. Sayce gave a report of the excursion to Emral and Erbistock, which took place on July 24, at which thirty-six members and friends were present. About 120 exposures were made, some of the work, which was very beautiful, being shown during the evening. Mr. P. Bebbington, of 12, Cornbrook Park-road, Chester-road, Manchester, attended, and explained his novel "Trafford" camera. Mr. Paul Lange showed his new American 5×4 camera, and Mr. Sanders, of Mount Pleasant, exhibited his novel and ingenious opera-glass camera, capable of making twenty-four exposures, as well as being useful as a telescope. The Eastman Company's new printing-out paper sample packet, and the Paget Prize Plate Company's sample packet of plates were distributed among the members. Mr. Lange gave a practical and enjoyable demonstration of the Platinotype Company's new cold-bath process, with the use of glycerine and brush manipulation. At the close, the Chairman spoke of the arduous work done by Mr. J. Woolfall in arranging the new premises, which would prove of incalculable value to the members. The membership is now 300, and is increasing every month. Mr. John H. Welch, in the absence of Mr. Illingworth, the secretary, conducted the proceedings, which were highly enjoyed.

Foochow Camera Club.—May 18, the President (Mr. G. Siemssen) in the chair.—The minutes of the last meeting were read by the Hon. Secretary, Mr. Mencarini, and confirmed. Mr. Rentzsch read a paper on *The Art of Grouping*, and said: "In a place like Foochow, where we have so few amateur photographers, it is somewhat difficult to find a subject which shall be interesting to all the members of the Club. In hunting round to find something suitable, Mr. Mencarini and myself thought that perhaps a few words on the posing of groups might be interesting, for, although it is to be regretted there are so few actual amateur photographers in the place, still we all at times find ourselves members of a group, and of professional help as regards the posing there is none. The poor Jap is silent in his one language, and it is difficult to see, unless he lifted the members of a group about like a lot of tailors' dummies, how he possibly could pose it, and as for the Chinese photographers, all art instinct is usually as absent from the Chinese character as the idea of honesty and truth; so, there being no professional help for us, the best thing we can do is to endeavour to help ourselves, and try and fix in our minds the few fundamental rules, by no means difficult to remember, as to how a group should be arranged. After a few words on this subject, I will, with your permission, arrange you as a group as badly as possible, and afterwards correctly, as well as I can, and Mr. Mencarini will take a flashlight picture of both, which he will proceed to develop with the very last of seven-syllabled developers. The first thing to consider is the background. Trees, as far as possible, should be avoided; the light falling on the leaves causes white spots in the picture, producing a very disagreeable effect. A light-coloured wall is as good as anything, or, better still, the front of a house, only then the group should be placed well in front of it, so that the building may be slightly out of focus, and not by its detail detract from the figures, which, be it remembered, should be portraits. The members of the group should be cautioned on no account to look higher than the top of the camera, and those on the right and left should look at it not with the eyes only, but by slightly turning the head. As far as it can possibly be avoided, do not have two heads next to one another on the same level, and do not have two ladies in light-coloured dress one beside the other—separate them by some one in the dark clothes. Arrange the group so that tall persons are in the middle, and short persons at each end, and in the case of ladies wearing white dresses, or colours which are white to the photographic eye, place them in the front row. The professional photographer frequently says, 'Please put on the beginning of a smile;' but as this usually results in a complete grin, and, in some cases, even a grimace, it seems to me far better to tell people to lightly close the lips, for nothing looks worse than to see a lot of people with their mouths half open in a semi-slobbering condition. It is impossible in a short paper like the present to enter into the deeper portion of the subject regarding the balance of the picture, and so on; but, if the foregoing rules are remembered, there may be some hope that the average group taken in Foochow will be somewhat improved. The preceding rules may be summarised as follows:—No trees in the background. No looking higher than the top of the camera. No two adjoining heads on the same level. And no mouths open."

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 13,632.—"Improvements in Photographic Apparatus on the Pinhole Air-Lens Principle." A. C. Ponton.—*Dated July* 26, 1892.

No. 13,777.—"Improvements in Lenses." M. J. Gunn.—*Dated July* 28, 1892.

No. 13,844.—"An Improved Washing Bath for Use in Photography." P. Antoine.—*Dated July* 29, 1892.

No. 13,857.—"Improvements in Springs for Use in Photographic Changing Boxes." A. S. Newman and J. Guardia.—*Dated July* 30, 1892.

PATENTS COMPLETED.

Improvements in Photographic Lenses or Objectives and in Apparatus connected therewith.

No. 10,748. Andrew John Stuart, Bretlands, Rusthall, Tunbridge Wells. *July* 9, 1892.

This invention consists in obstructing or cutting off the light by any means whatever from the central portion of the surface of photographic lenses or objectives, single or compound.

In obstructing by any means whatever the rays of light which fall on the central portion of the surface of such photographic lenses or objectives, so that the image will be formed by the rays which fall upon that portion of the lens which is outside the part so obstructed or covered up. The shape of such obstruction may be circular or oval, or of any other form.

Such obstruction may be caused by any mechanical means whatever; for instance, by a disc of metal or of any other substance in front of the lens, or by a disc of tinfoil, or a disc or spot of paint or of any other substance adhering to the lens, or by cutting the lens in such a manner as to obstruct the rays.

In the case of compound lenses or objectives, such obstruction may be applied to any or all the lenses of which the compound lens is constructed, or to the whole as a compound lens.

Patent protection is sought for the above-mentioned, as well as for all other possible ways of causing the obstruction described above.

The means of obstruction may be of such construction as to admit of the area obstructed being varied at pleasure by the use of the principle of the "iris diaphragm," or by a rotating carrier bearing discs of different sizes. Protection is sought for the application of these or of any other mechanical means for enlarging or reducing the area obstructed at pleasure.

The means by which such obstruction of light is obtained may, for the sake of convenience, be called "a central diaphragm," and will hereinafter be referred to by that phrase.

Such "central diaphragm," in whatever manner constructed, may be combined with the ordinary diaphragm as now in general use, so as to enlarge or contract the area of the lens surface exposed, and by which the picture is formed, so also as to limit the rays falling upon the outer portions of the plate to those coming from one portion only of the lens, or of so much of it as is exposed.

It is the combination of this use of the ordinary diaphragm, which is a part of the ordinary construction of photographic lenses, with the obstruction in the centre of the aperture by the "central diaphragm," which is the most important and novel feature in the present improvement.

It is believed that by this invention a better illumination will be obtained, especially in the outer parts of the field or plate, a more even illumination resulting in more even development, and in more equal density in the picture when finished, better definition, in the outer portions of the field especially, more rapidity in the lens, with less distortion and more flatness of field.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—1. Protection for the use of the "central diaphragm" as above described in the construction or use of photographic lenses or combinations of lenses or objectives as such are now constructed or used. 2. For the use of the said "central diaphragm" either by itself or in combination with diaphragms of the ordinary kind now in use, in the manufacture or use of photographic lenses or objectives, whether single or compound. 3. The application of the principle of the iris diaphragm, or of a rotating carrier bearing discs of different sizes, or of any other mechanical contrivance for varying at pleasure the area obstructed by the "central diaphragm."

[If the patentee will call at our office by appointment, we will show him several articles, in this and other journals, some of them written considerably over a quarter of a century since, in which the use of the "central diaphragm" is advocated and its construction described.—Ed.]

Correspondence.

THIO-CARBAMIDE REVERSALS—YELLOW SCREENS.

To the EDITOR.

SIR,—With reference to the note on page 374 of THE BRITISH JOURNAL OF PHOTOGRAPHY for June 10th, regarding Mons. Fourtier's failure to work the reversed process with thio-sinamine, I very much regret that I am unable to give him any further information than that given in THE BRITISH JOURNAL OF PHOTOGRAPHY for September, 1890, pages 602 and 613, and in 1891, page 261; also in last year's ALMANAC, as well as in other journals, English and French.

I should, however, advise him to try with Professor Emerson Reynolds' compound salt of thio-carbamide and ammonium bromide, referred to in THE BRITISH JOURNAL OF PHOTOGRAPHY, 1890, page 673, which has consistently given me better results than any other of the thio-carbamides tried. It can be obtained from Messrs. Hopkin & Williams, and is conveniently soluble in the proportion of 1 to 100 in alcohol. A few drops of this solution may be added to a developer made of—

Eikonogen	1 part.
Lithia Carbonate	1 ,,
Soda sulphite	1 ,,
Water	100 parts.

Each kind of dry plate and subject requires its own special treatment, and as a rule some preliminary oxidation of the film is necessary, but I have no further definite information to give.

I hoped to have resumed this work on my return here, in order to find out a reliable and certain method of using the thio-carbamides for reversals, but have hitherto been unable to do so. Trials made with collodio-bromide emulsion have given prospect of success, and I shall probably turn my attention in this direction in connexion with other work with collodio-bromide emulsions. In the meantime, if I can render Mons. Fourtier any assistance in the matter I shall be very glad to do so if he will communicate with me, and let me know his special difficulties.

I observe in the same number of THE BRITISH JOURNAL OF PHOTOGRAPHY an article on "Yellow Screens for Orthochromatic Work," in which compound screens of gelatine and collodion are described. I have not a very large experience in this question, but what I have leads me strongly to recommend good glass screens in preference to any film, though film screens may be useful for obtaining special tints that could be obtained in no other way. I find that with collodion or gelatine screens there is always more or less loss of definition. The best screens of this kind I have used were made of clear thin talc or mica coated with a *cold drying* crystal varnish made of benzole and sandarac or dammar coloured with annatto, turmeric, or other colouring matters soluble in benzole, which, unfortunately, most of the yellow "coal tar" dyes are not. A good spirit varnish or lacquer would probably answer as well, but all spirit varnishes are difficult to use in the moist Bengal climate. Varnish is far more structureless than collodion. The formula used for the varnish was—

Turmeric varnish	2 parts.
Annatto	1 part.
Kamala	1 ,,

The turmeric varnish has a greenish tinge, the annatto a reddish tinge, and the kamala (made from a powder obtained from *Rottleria tinctoria*) a neutral yellow. By varying the proportions different tints can be obtained. Other yellow dye stuffs soluble in benzole could also be used. This varnish applied to worked glass gave very good results for copying work, when placed behind the lens. The coated linen can be used in double diaphragms.

Suitable yellow glasses are now so easily obtained, and are so effective and uniform in use that I would certainly recommend them in preference to any varnished screen, which, even if it does not damage the definition of the image, is always liable to injury, and to change of colour by fading of the dyes.—I am, yours, &c., J. WATERHOUSE.

Survey of India Office, Calcutta, July 12, 1892.

[In the current number of the *Photo-Gazette* (Paris), M. Fourtier details some successful reversal experiments with a different sample of thio-sinamine to that which he employed on the former occasion.—ED.]

THE FOCUSSING SCREEN THE BEST ACTINOGRAPH.

To the EDITOR.

SIR,—Permit me through the medium of your valuable paper to endorse the opinions of Mr. Bedding in his paper to the North Middlesex Photographic Society, on the above subject.

I commenced photography some seven or eight years ago, and all my friends and acquaintances knew about as much of the subject as I did myself, which was absolutely nothing at all. My knowledge therefore had to be gained chiefly by the greatest of all teachers—experience. I certainly gained a certain amount of information from the manuals published on photography, but my knowledge of "exposure" was all got by practical experience. I quite agree with Mr. Bedding when he says, "that a man who takes up photography will surmount the difficulties of exposure by the aid of his own brains, or not at all." I have never used an actinograph, or anything of the kind, and never mean to, as I place more reliance on my own judgment of what exposure is necessary by the appearance of the picture as presented to me on the focussing screen of my camera. During my comparatively short experience I have come across many amateurs who always, when making an exposure, use one or other of these "so-called aids," and who, for the life of them could not correctly expose a plate without it, and in many cases when they have used it, find their negatives improperly exposed. Exposure-meters always put me in mind of "ready reckoners" in a counting house, which the clerks invariably fly to if there is a small calculation to make instead of using their own brains.

My advice to all brother amateurs is, use your own brains, cultivate your memory of pictures you have taken before, compare mentally the aspect of the one with the other, and form your own judgment of what exposure should be given, and the experience thus gained will stand you in better stead than all the actinometers put together.

In conclusion, I should like to contribute my small mead of praise for the able manner in which Mr. Bedding treated the subject, and have no doubt but that the paper will be read with great pleasure, both by professionals and amateurs alike.—I am, yours, &c., W. A. COLE.

Berlin House, Moseley, Birmingham, July 30, 1892.

LOSS OF DENSITY IN FIXING.

To the EDITOR.

SIR,—Your apology for putting *account* instead of *atone* has been noted by the *whole* French press, and war, with all of its modern improvements, has once more been averted.

Your notice in regard to losing of intensity in negatives in the fixing bath may be correct; yet, call it as you like, the fact remains that seemingly or not some makers' dry plates have to be pushed much further than others, and this fact ought to be recorded on the package, I think. Light in the dark room may be taken as an excuse with some, but probably with very few. If a candle is used, it is pretty much always the same, and, when a lamp or gas flame, this is pretty much always regulated at the same height by any half careful operator, and made to suit his lantern; and, as to this last one, I do not think that the red glasses are replaced more than when absolutely necessary, and that is usually (here in France) when broken. I use gaslight, and that is even enough.

But where you are wrong altogether is when you say that a wet negative appears denser than a dry one. The reverse is an absolute fact with us at least, and I do not think that I am an exception. This can, however, be very easily understood and explained. In a wet negative the gelatine is largely swollen, the particles of reduced silver very much apart, and light passes very freely, so much so that in shadows some details will not show at all when wet, while when dry they will be most apparent. I do not think I will be contradicted on that point.—I am, yours, &c., A. LEVY.

Asnières, July 23, 1892.

To the EDITOR.

SIR,—Having noticed that an old acid fixing bath dissolved the whole of the silver from a plate in the course of a few days, the following trials were made to ascertain to what extent reduction would be likely to take place during the short time required for fixing negatives. Pieces of a plate having upon it the following densities: 1·46, 1·00, and ·58, were placed in new and old acid fixing baths. After sixty hours in the new bath the densities were reduced to 1·35, ·9, and ·49, and after forty-eight hours in the old bath to ·54, ·30, and ·16. Evidently the loss of density in half an hour must be very slight indeed.—I am, yours, &c.,

Red Hill, August 1, 1892. JOHN STERRY.

SPEED OF PLATES.

To the EDITOR.

SIR,—At the end of his letter in your last issue, Mr. Watkins asks, "What is the meaning of development factor?"

On page 10 of Messrs. Hurter & Driffield's paper, second column, line ten, it is described as a "constant depending upon the time of development," and it is afterwards represented by γ in the various formulæ. The necessity for its consideration and its value are found on pages 11 and 13, and its most important practical bearing is mentioned on the last page.

Perhaps Mr. Watkins will understand its meaning best by my stating that the development factor includes that which he asserts Messrs. Hurter & Driffield have omitted, where he says, "This method leaves entirely out of the question, whether this correct scale of gradation has sufficient opacity in the highest terms of its scale to provide practical

printing density in a negative." It is, in fact, for practical purposes, the measure of the printing value of a negative at any particular stage of development; or, in other words, it indicates the difference in result which is obtained with different plates, developed for the same time, or, if desired, the same plate for different times.

The object of my letter (July 8) was to show that Mr. Watkins' proposed method of developing for a definite time would fail to give the desired results, because equal densities would not necessarily be obtained with plates of equal speed, as shown by plates 2 and 4, the latter requiring a longer time of development to obtain equal densities.

With regard to plate 3, had Mr. Watkins understood the meaning of the development factor, and had also noticed the following upon page 13 of Messrs. Hurter & Driffield's paper, "Experiments which we have made indicate that for the production of artistic effects on ordinary silver chloride paper, it is necessary to prolong the development, γ is greater than 1, and nearly reaches the value 2," he would have seen that none of the plates 1 to 4 had received sufficient development to be suitable for either silver or platinum paper printing, and he would not have so hastily condemned plate 3.

The longest development of that plate of which I have any record gives results as under, and, though by no means the highest densities, which could easily be obtained, it shows the density 1·73 (opacity 54) nearly reached within the correct period of the plate.

C. M. S.	2½	5	10	20	40
Density	·81	1·23	1·62	1·96	2·3
Opacity	6·45	16·6	41·7	91·2	199

Inertia, ·65. Actinograph speed, 52. Development factor, 1·4.

The opacities are added because Mr. Watkins seems to think most can be learnt from them. If so, it is necessary to point out that in the table he gives all the densities over 2·0 have been incorrectly translated.

"Certain classes of emulsions," Mr. Watkins says, when tested by Messrs. Hurter & Driffield's method, show a "sensitiveness not substantiated when the plate is exposed in the camera." None such have come under my notice during twelve months' trials; and, as to the old red-label Ilford plates he mentions, Messrs. Hurter & Driffield said, "we found it very *difficult* to ascertain their true speed in the camera on account of the difficulty in securing adequate density," from which it is evident that they overcame the difficulties which Mr. Watkins found insuperable.

I cannot agree with the statement that "there is very little that is absolute about the science of photography," for already much has been proved.—I am, yours, &c.,

JOHN STZABY.

Red Hill, August 1, 1892.

CONCERNING PETITIONS PERTAINING TO THE PHOTOGRAPHIC PRIVILEGES AT THE WORLD'S COLUMBIAN EXPOSITION.

To the EDITOR.

SIR,—It is very gratifying to those engaged in the endeavour to secure the general right of photographing at the Chicago Exposition to note the unanimous action of the Photographic Convention of the United Kingdom in protesting against the restriction of the privilege, as has been proposed by the Ways and Means Committee. This vote, together with the many petitions which are being received from other English societies, will have a beneficial influence on our cause. Since this agitation was begun there are indications that the wishes of the thousands of photographers will be respected.

Having learned, through an oversight on the part of my clerk, that many of the petitions were mailed short of postage to the English societies, I would ask for a short space in your valuable JOURNAL to say to any who were obliged to pay double rates that the same will be refunded to them by Miss C. W. Barnes, if addressed to care of the JOURNAL.

The more foreign societies we can hear from, the greater will be the weight of the petition.

There is a principle involved that has never been thought of before, and in urging greater freedom in the exercise of the photographic privilege at public places we shall undoubtedly, should we succeed, benefit not only the amateurs, but all photographers and manufacturers. Any photographers may send me their names to be affixed to the petition, whether or not they belong to a club or society. All are welcome to participate in aiding this movement.—I am, yours, &c.,

F. C. BEACH.

239, *Fifth-avenue, New York, July* 26, 1892.

PERMANENCY OF GELATINO-CHLORIDE PRINTS.

To the EDITOR.

SIR,—The enclosed print is a proof that Ilford P.O.P. is likely to be permanent under ordinary conditions. The print was made last December, and placed, with one half covered up, in a south window; it has been taken down several times, soaked in water, and replaced wet.

The print is a poor one, from a thin negative; just the kind of print one might expect to fade and turn yellow. You will see there is no visible change between the half that has been kept covered and the other, and the whites are as pure as when first made. The print was toned in a borax bath, which in my hands gives good results with this paper.—I am, yours, &c.,

H. G. M. CONYBEARE.

The Hut, Ingatestone, July 31, 1892.

EASTMAN PELLICLE.

To the EDITOR.

SIR,—You noticed, not long ago, some negatives of Eastman pellicle on a film two years in the roll holder and three years in stock; and I send you to-day some made on the old American negative paper, coated in April, 1885. I exposed four films, and send you the whole.—I am, yours, &c.,

W. J. STILLMAN.

Rome, July 29, 1892.

[The quality of the negatives is excellent, and decidedly attests the remarkable keeping properties of the Eastman negative paper.—ED.]

THE COLLECTION OF RESIDUES.

To the EDITOR.

SIR,—Referring to your leader in the last issue of THE BRITISH JOURNAL OF PHOTOGRAPHY about collecting photographic residues, it will be found that gelatine exercises considerable influence in delaying the precipitation of dilute solutions of silver chloride, whether the precipitant has been salt or hydrochloric acid. It is a most difficult matter to precipitate thoroughly, to say nothing of rapidly, any very dilute solution of silver salt in the presence of undecomposed gelatine. Gelatine may be introduced by washings of vessels used in the preparation of emulsions or in other manners. The waste solutions of photographic laboratories are generally of a very miscellaneous character, and it will save trouble to bear in mind that any containing gelatine should have that colloid thoroughly decomposed before adding it to the bulk of waste, as when diffused in a large quantity of water it is not so easily decomposed as when it is in a more concentrated form.

I am unprepared to say if the addition of lead acetate would get over the difficulty, not having tried it; but, as the action is purely physical, it is merely a question will the extra weight and coarseness of the precipitate overcome the viscosity of the gelatine. I merely mention this, as gelatine *has* to be reckoned for in the collection of residues in ordinary procedure.—I am, yours, &c.,

EDWARD DUNMORE.

August 2, 1892.

ESTIMATION OF SILVER NITRATE.

To the EDITOR.

SIR,—Thinking that perhaps the results of an estimation by *weight* of a sample of cheap silver nitrate in the market might be of interest, I venture to send the numerical details of one undertaken by myself some months ago in consequence of an account of the then market value of silver, as contained in an article, I think, in your valuable JOURNAL.

The price paid for this particular sample was 2*s.* 5½*d.* or 2*s.* 6*d.* for the *single ounce*, and was labelled as pure recrystallised nitrate of silver, and, as the results obtained in actual practice, when used as a sensitising bath for wet plates, are in the highest degree satisfactory, argues, I think, further proof of the results of the estimation being fairly accurate.

ESTIMATION OF Ag IN $AgNO_3$.

Weighing bottle + $AgNO_3$ = 8·394 grammes,
" " 7·142 "
Weight of $AgNO_3$ taken ∴ = 1·252 "

Weight after precipitating as chloride, washing, drying, and fusing:—
Weight of porcelain crucible + Ag Cl = 13·654 grammes,
" " " = 12·599 "
1·055
Less ash of filter paper ·00866 "
Weight of Ag Cl found 1·05134 "

∴ Ag Cl Ag Cl Ag
143·5 : 1·05134 :: 108 : x = ·7912 of silver.
∴ 1·252 : 100 :: ·7912 : x % of silver in the weight of silver nitrate taken = 63·19 % of silver.

Silver calculated theoretically 63·53 grammes,
" found experimentally 63·19 "
Difference ·34

If you should consider this of any value, please note that it is only the result of *one*, although very carefully made, estimation.—I am, yours, &c.,

E. SENIOR,
Honours Medallist, and late Student Polytechnic School of Photography.

219, *Camberwell New Road, London, S.E., August* 2, 1892.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges" must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PROFESSOR E. STEBBING.—Many thanks.

A. CAMPBELL.—Make the sulphite solution decidedly acid.

A. L. W.—A solution of "ordinary sulphite of soda" should be neutral to test paper.

S. ANDREWS.—In using matt varnish, the plate should not be warmed, either before or after its application.

HARRY VINCENT.—Precipitate the silver in the solution with potassium sulphide. You will then obtain the silver as sulphide.

FERRO.—No; iron development is by no means extinct. It is extensively employed on the Continent for both negative and positive work.

S. A. B.—If the instrument is in good condition, it is very cheap at the price asked. Have an undertaking that it is by the maker whose name it bears.

H. T.—Possibly the lead is the primary cause of the fugitiveness of your prints. We should recommend you to revert to the use of porcelain dishes.

SIMPLEX (Penshurst).—An over-printed silver print may be sensibly reduced by treating it with a weak solution of bichloride of mercury. Fixation is unnecessary.

J. W. says: "Can you give me the address of a manufacturer of dry ferrotype plates?"—Mr. L. Nievsky supplies such plates. Address him, care of Mr. Fallowfield, Charing Cross-road, W.C.

C. J. T.—We should think that the print with the blue spots had been exposed to light during toning, and that the toning solution had not been kept in motion. Both prints appear to be over-toned.

E. E. H. asks if the patent for stannotype process has expired, or whether it is still in force.—We have an idea that it lapsed a year or so ago, but we are not sure. The information can be obtained at the Patent Office.

H. COLEBROOK.—Coloured screens for orthochromatic work may be obtained of Mr. J. R. Gotz, 19, Buckingham-street, Strand, W.C. We believe they are to be had in various tints. They are comparatively inexpensive.

H. A. C.—If the colour on the mount comes off as soon as it is damped, the boards are not suitable for photographs. Better obtain mounts made for the purpose. They may cost a little more, but will prove cheaper in the end.

TOURIST.—There are no means, when purchasing views of local scenery, of knowing if they will fade quickly or not. Of course, if they are produced by a mechanical process, such as collotype, as some are, there is no fear of their fading.

HADJE.—The best advice we can give you is to procure a manual of photography that treats practically of the wet collodion process. It is elementary instruction you require. An early edition of Jabez Hughes, or any other manual, will answer your requirements.

W. MCARTHUR. The staining of the negatives does not arise from any defect in the plates, but is caused by the manipulations; *i.e.*, the fault is yours. The negatives were insufficiently washed between the different operations. Greater care in future will avoid the stains.

J. A. (York).—The fixing solution from dry plates is certainly worth saving, even in a not very large business, and it involves little or no extra trouble. All that is necessary is to pour the old solution into that used for fixing prints. One receptacle will then do for both solutions.

ARTIST.—Bromide, carbon, and platinotype pictures are finished with ordinary water colours; no special medium is required beyond occasionally a little gum water. As you fail to get the effect you desire, why not take a few lessons from a professional?—it might possibly save you much trouble.

R. BIDGOOD says: "I have an old document on parchment to copy, which is very yellow, and I cannot get a brillian negative. Do you think that a better result could be got by using plates orthochromatised as described on p. 774 of the ALMANAC?"—Yes; we have no doubt on the subject.

P. YOUNG.—1. In using a portrait lens for enlarging from small negatives the back combination should be next the negative. 2. If the lens is what is known as a cabinet lens, no stops ought to be required when enlarging from a *carte*-size negative. 3. The suggested arrangement will do quite well.

ALPHA.—There is no novelty in a studio that can be revolved on a centre. A patent for a revolving studio would not be valid. It is quite possible that a patent might be good for any special method of mounting it or means of rotating it. If an invention be old, although it can be patented, the patent will not be valid.

DUBIOUS.—Gelatino-chloride prints, toned with the combined toning and fixing bath (which differs materially from the combined bath formerly employed with albumen prints) appear to us to have as reasonable a chance of permanency as other prints. The old combined bath was superseded by alkaline gold toning.

INQUIRER.—Without a chemical investigation—which we have not time to make; indeed, we do not undertake such work—it is impossible to say whether the mount contains deleterious matters or not. Your best way will be to send some of the suspected mounts to an analytical chemist, and get him to report upon them.

PRINTER.—You are probably correct in stating that Mr. J. W. Swan was the first to employ a gelatino-bromide emulsion for developable prints, but you are wrong in concluding that he was the first to use gelatine as a vehicle for any printing process whatever. In 1865 a patent was obtained by Messrs. Smith & Co. for the application of printing-out gelatino-chloride emulsion to paper, wood, and other supports.

STAFFORD.—The best method of cleaning the films of spoilt negatives off th glass is to soak them for a day or so in cold water, and then to immerse them in hot. The gelatine will then be dissolved. This treatment will also answer with negatives that have been varnished. We strongly suspect however, that you will have all your trouble for nothing, as we doubt very much if any plate-maker will allow you anything for the glass.

R. C. E. says: "I have frequently seen permanganate of potash recommended for intensifying carbon transparencies, would it not answer also for the intensification of lantern slides made on the ordinary plates?"—It would not answer. With the permanganate it is the gelatine that is acted upon, and that is a uniform film on a bromide plate. In a carbon picture it is of varying thickness. In the highest lights there is no gelatine at all.

W. W. says: "The toning bath I made up the other day has become quite brown, although it was made in the same way as usual. The only difference was that it was a fresh lot of distilled water obtained from a local druggist. Can you suggest any reason for its behaviour except the water?"—Supposing the vessel in which the bath was prepared was clean, there is small doubt the water was at fault. A local druggist's is not the most reliable place to obtain pure distilled water.

J. P. MILNES writes: "Can you kindly inform me as to the best method for placing another person in a group? I took a group the other day, and, to complete the picture, the party wish a photograph of a brother now in Australia put in the picture. Can you inform me as to the best and neatest way to proceed? I have left a small space behind just to get his head and shoulders in."—In reply: Take a negative of the portrait to the scale of the others in the picture, and of the same density. When finished, immerse in water containing a few drops of hydrofluoric acid per ounce. In a few minutes the film will leave the glass and may be floated on a sheet of hard paper face downward. When dry it can be cut, paper and all, to fit a place scraped out of the negative to receive it. A little gum will serve to attach it, when the paper must be removed.

WEST LONDON PHOTOGRAPHIC SOCIETY.—August 6, West Drayton, to meet the Ealing Photographic Society.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—August 11, *Development of Instantaneous Exposures.* 18, *Stereoscopic Photography, with Specimens.*

PHOTOGRAPHIC CLUB.—August 10, *Opal Pictures.* 17, *Photographing Interiors.* Outing, Saturday, August 6, High Barnet; train from Broad-street, eight minutes past two; Finsbury Park, twenty-five minutes past two.

THE DEVELOPAN is a portable dish for the development of negatives in an ordinary apartment. The apparatus consists of a tray and cover. Each tray is provided with a pane of non-actinic glass, the whole forming a transparent box, which, being held up before the flame of a candle or lamp, enables the operator to perceive the progress of development. The negative having been transferred to the "Developan," the developing solution is poured into it by means of the nozzle, a perforated screen inside preventing the passage of any light. The "Developan" is neatly constructed, and should prove effective. It is patented by M. A. Desbontin, and sold by the Developan Manufacturing Company, of 130, Charing Cross-road, W.C.

HAND CAMERA PICTURES AT THE CONVENTION.—Mr. W. D. Welford informs us that he is desirous of arranging a meeting in London, on or about the 10th inst., of those who had hand cameras at the Convention. He proposes that they should attend a non-formal gathering, and those who cannot should send their prints. All the hand-camera men at the Convention, and any others interested, are invited to send a postcard to Mr. Welford (47, Hagley-road, Birmingham), and he will, in return, state the exact date, place, and time of the meeting. A portfolio or album of all the shots secured by hand cameras at the Convention would prove of interest, as they are so completely different to ordinary camera work, and the variety of subject much greater. Mr. Welford will make a suggestion on this point.

**** With the* JOURNAL *of Friday next will be presented a collotype reproduction of the group of the members of the Photographic Convention of the United Kingdom assembled at Edinburgh on July* 15. *The picture was taken by Mr. Alexander Ayton, jun., and comprises about* 130 *members, probably the largest number ever included in a Convention group.*

CONTENTS.

Phototypie F. Thévoz & Cie., Genève

MEMBERS OF THE SIXTH ANNUAL PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1684. Vol. XXXIX.—AUGUST 12, 1892.

EQUALISING THE ILLUMINATION OF NEGATIVES.

It is never but with the greatest reluctance that we append to the patent specification of a worthy invention any remark as to its being lacking in novelty, and consequently being invalid.

This we felt compelled to do last week when publishing the details of the invention, by Mr. Andrew John Stuart, of what he designates a "Central Diaphragm" for a photographic lens. The leading feature in the invention of this gentleman consists in obstructing or cutting off the light from the central portion of the lens, so that the image shall be formed by the rays which fall upon that portion of the lens outside the part so obstructed or covered up.

Although the patentee does not describe or explain by what means such an opaque diaphragm conduces to the production of a photograph more evenly lighted than can be secured without such an expedient, yet we hope here to supply the hiatus, although in doing so it will, we fear, only stamp in more enduring form the brand of weakness of Mr. Stuart's invention as a valid patent.

By way of introducing the matter generally, we may observe that, theoretically, the centre of a picture is always better illuminated than its sides, although, when only a narrow angle of view is included and a stop is used, the difference as regards equality of illumination is so slight as not to be observed. It is when very wide angles are pourtrayed that the falling off towards the margins becomes apparent. This is an invariable concomitant of the employment of a wide-angle lens when used to produce a picture of wide angle.

No lens has yet been made, or can be made, which, with an ordinary camera, can give illumination at the margin of the same intensity as at the centre; and this, for two reasons. First, the aperture of the stop, greatest when the light passes through it when placed parallel to the plate or at a right angle to the axis of the lens, is seen to become more and more oval, or lessened in its area, in proportion to the obliquity it presents to the sides of the plate; in short, less light is transmitted obliquely than centrally. And further, the sides of a plate being at a greater distance from the lens than the centre of the plate, this smaller and more attenuated beam has also farther to travel than the axial one ere it reaches its focal plane. Hence the diminution of the lighting.

This was well recognised in former times, and various schemes were suggested for equalising the lighting all over the plate. So long ago as 1863 an eminent writer on optics, the late Mr. Thos. Grubb, of the Bank of Ireland, suggested a means of doing so by the employment of an opaque diaphragm, so placed in relation to the stop of the lens as to allow full transmission of light to the margins while cutting much of it off from the centre of the picture, which is precisely what is sought to be done by the new patent. No one need to be told that, if an opaque circle be placed either outside or inside of the stop, and at a suitable distance from it, the effect will be to suppress much of the central or axial rays, while allowing free transmission to the more marginal ones. This supplies the condition for ensuring equality of illumination all over the plate.

In 1866, three years after the date previously given, this subject was brought prominently before the notice of the Edinburgh Photographic Society by Mr. George Slight, a skilful mechanical engineer, who found that all the requirements for ensuring equal horizontal lighting over the plate could be provided for by a vertical bar "at such a distance from the ordinary round stop that about one-half to two-thirds of the opening is uncovered for illuminating the extreme end of the plate, and of such a breadth as to cover from one-half to two-thirds of the opening for the centre, illuminating the centre by two equal segments of the circle, while the intermediate portions are illuminated by two varying segments, the sum of which gradually increases with the angle of inclination, until, at a point near the extremity, only one segment is employed." This subject also formed the theme for elaborate calculations by Messrs. R. H. Bow, M. Carey Lea, and others.

A method analogous to that described was published eleven years ago in the *Photographic Times* of New York, and subsequently in a treatise on the optics of photography. It consists of a small V-shaped bit of metal mounted at a short distance in front or behind the stop. As we have used this for over fifteen years, we can attest its efficiency.

We cannot imagine that the patentee of the system alluded to could have been aware of all that has been published and freely given to the public so many years since, else would he have hesitated before placing himself in an invidious position by taking a patent for it—a patent which, in the light of what we have here written, will, doubtless, not be attempted to be maintained.

THE FERROUS OXALATE DEVELOPER.

I

We are constantly in receipt of inquiries as to the best means of restoring the action of spent ferrous oxalate developing solution as well as of recovering the valuable constituents, if any, of the solution, which, though it may have ceased to be practically useful, is still far from being exhausted of its active constituents. Although the question of renovation and recovery of residues has been dealt with in our columns, it is some years ago, and since that time not only have many new recruits joined the ranks of photography, but the vast spread of enlarging and other applications of gelatino-bromide paper has caused the ferrous oxalate developer to be employed by

many more, both amateur and professional, who had not previously adopted it for negative work. There is, consequently, a large class of modern photographers to whom the repetition and extension of the information previously given may prove useful.

The ferrous oxalate developer is without doubt a comparatively expensive one unless employed under the most favourable conditions, and unfortunately those conditions are not such as prevail in the majority of cases whether amateur or professional. We assume that in this country, at least, this developer is now but little employed for negative work; hence it only comes into use when enlarging, or contact bromide prints are being worked, and this probably does not occur every day in a very large number of professional laboratories, while, so far as the amateur is concerned, the task is very likely only taken up at wide and irregular intervals.

Now, it is well known that, though the unused solution will keep fairly well, and retain its developing action if carefully stored, yet, after once using, be it only for a single development, it rapidly loses its energy, in spite of all the care that may be exercised in avoiding oxidation. This is, of course, a very annoying circumstance in cases where the work is of a fitful nature even when only small contact prints are concerned, for it practically limits the extent to which the employment over and over again can be carried, and may mean that a fresh quantity of solution has to be used for each print. If enlargements of considerable dimensions are in question, say 24 × 18, or perhaps larger, the amateur at any rate, even though he work such sizes, cannot be constantly at it, nor is it likely that the ordinary professional who does his own enlarging can be much more favourably placed; then, indeed, the costliness of this developer makes itself heavily felt, and then, if it be possible, a method of renovation, or even of recovery, of the potassic oxalate will be found valuable.

As regards renovation, we are afraid there is no really trustworthy method to be recommended, although several have been put forward, but unfortunately they are none of them to be invariably depended on. In the case of a solution that has been but little used, perhaps only for a print or two, the oldest and most theoretically correct plan in principle, heating with a little clean iron wire, will be found to answer fairly well; or the addition of a little precipitated oxalate of iron, as proposed by some, may prove of benefit, but we have not found it of much practical use. Another plan differs from these in principle, since it aims at restoring the altered or oxidised constituents of the developer instead of, as in the other cases, replenishing the active matter that has been removed. This consists in adding to the developer a solution of sulphite of soda, or, better still, of potash, which, by reducing any ferric oxalate that may have been formed by oxidation to the ferrous state, will often give a fillip to a solution that has partially or wholly lost its power. Perhaps in a combination of the two systems—replenishing as well as restoring—will be found the best result to be obtained by the process of renovation.

But these methods, or this process, unfortunately overlooks the important fact that other changes occur besides the exhaustion and the oxidation of the active developing salt, the ferrous oxalate. They have for result in the first-named methods the replacement of the iron converted into oxide by the action of development, though this is done in a more perfect manner by the iron-wire treatment than by the other. In the first the oxalic acid set free, which goes to form a double salt that will be mentioned later, attacks the metal and forms ferrous oxalate, which in turn is taken up by the oxalate of potash that has been relieved of its duty by the previous precipitation, and, so far at least as the oxalic acid and iron are concerned, matters are restored to much their original state. But the direct addition of oxalate of iron, while it restores the original activity, leaves the oxalic acid free to act as a restrainer. The treatment with a sulphite acts by removing the restraining action of the ferric salt, by reducing it to the lower state of oxidation, in which condition it again becomes active; but it does nothing to replenish the active iron actually used. From this explanation it will be seen why we urge the combination of the two systems.

But where this plan altogether fails is in overlooking the other substances that are introduced into the solution by the action of development, notably the hydrobromic acid liberated from the reduced silver in the film. The powerful restraining action of this acid, or, we should more correctly say, its *destructive* action on the image, is sufficient to account for the practical impossibility of restoring the energy of much-used solutions, since they then contain in themselves sufficient material to destroy the image formed, and so render development impossible.

Similar in its action to free hydrobromic acid, ferric oxalate behaves in a precisely like manner, destroying the image and arresting development. Hence an old developer, that has not been much used but has been allowed to become oxidised, will be found as inoperative as one that has been much used. But in this case it may be found possible to, at least partially, restore it by deoxidation. It is important to recognise the two different states of uselessness. One developer is *worked* out; the other may truly be said to have *rusted* out.

In considering the recovery of the more valuable constituents of the spent developer, we shall have to study first its chemical composition, both before and after use; but we may say a preliminary word on the advisability of this course, or rather on the question as to whether it is worth while. We may state at once our opinion that, though it may be a pretty operation on an experimental scale, it will certainly not prove a remunerative one, and that, even on a very considerable scale, it will remain to be decided whether the "game is really worth the candle." Our view is, that only by the exercise of the greatest care and the most perfect system will any pecuniary benefit be found to accrue. We shall leave our readers to judge from a perusal of the following plan, which we have found the most perfect in an experimental way.

The ferrous oxalate developer prepared in the way just recommended by Mr. M. Carey Lea and Mr. W. Willis, by dissolving precipitated ferrous oxalate in a hot saturated solution of potassic oxalate, may be looked upon practically as a solution of potassio ferrous oxalalate, a double salt represented by the formula $K_2\,Fe\,(C_2\,O_4)^2$. It may be precipitated from the solution in conjunction with two atoms of water by the addition of alcohol, forming first a deep red oily liquid, which subsequently forms into minute granular crystals of the same colour. This compound salt we may call the active developer, since, though ferrous oxalate is the actual reducer, it is *per se* insoluble, and therefore inert.

The developer, as ordinarily employed nowadays, is, however, made by mixing solutions of ferrous sulphate and potassic oxalate, the latter being in excess; this, by double decomposition, forms ferrous oxalate and potassic sulphate, the former being held in solution by the excess of potassic oxalate. This solution differs from the other by the presence of the potassic

sulphate, which acts as a restrainer. In our succeeding remarks we shall deal simply with the pure solution.

The deep red solution of potassio-ferrous oxalate is very unstable, and easily passes to a higher state of oxidation, a fact to which it mainly owes its developing power. The final change that occurs in the solution, whether by exhaustion in development or mere oxidation by keeping, is the same, except that in the former case there is the contamination of hydrobromic acid derived from the sensitive film. On this difference we shall have to remark presently. The actual change that occurs results in the precipitation of oxide of iron and the formation of another double salt, the potassio-ferric oxalate, as shown in the following equation—

$$\underset{\text{3 atoms.}}{3\,K_2\,Fe\,(C_2\,O_4)^2} + \underset{\text{1 atom.}}{O} = \underset{\text{2 atoms.}}{2\,K_2\,Fe\,(C_2\,O_4)^3} + \underset{\text{1 atom.}}{Fe\,O.}$$

Potassio-ferrous oxalate + Oxygen = Potassio-ferric oxalate + Ferrous oxide.

The oxide of iron, of course, assumes the form of hydrate and very rapidly passes to the stage of ferric oxide. The latter forms the rusty brown-red precipitate always seen more or less in old iron-developing solutions, but especially in those that have, as we described it, "rusted" out in contradistinction to being worked out by development. Probably the presence of the hydrobromic acid, derived from the sensitive film in the course of development, is the cause of the smaller precipitate of oxide in that case.

The potassio-ferric oxalate differs very considerably from the salt of lower oxidation, having the form of handsome flat crystals of a brilliant emerald green colour, and of a much lower degree of solubility than the ferrous salt, in consequence of which they crystallise out of the old developers, and form the well-known green crystals that form, with the oxide of iron, the deposit in such solutions. Of these crystals we shall have more to say, in dealing with the process of recovery, in another article.

PHOTOGRAVURE.

The paper on the above subject that was read at a meeting of the Photographic Society of Great Britain a short time back has now been published, and will be found on page 523. At the meeting at which it was read disappointment was felt by some that the author, who is a practical photographic engraver, did not give any working details of the different processes to which reference was made. However, the paper is one that will be perused with interest by many of our readers who are interested in the subject. At the conclusion of the paper, however, upon the suggestion of the chairman, allusion was made, in outline, to some of the methods in daily use.

Photogravure may be classed under two heads: One, the etching method, by which the intaglio image is obtained by biting into the metal, usually copper, with an agent that is capable of dissolving that metal; the other, by forming the plate by depositing copper, by electrolysis, on an image in relief in gelatine. Both systems are capable of producing excellent results, and neither of them is complex in its manipulations. It is to remarks on the latter method that we shall here confine ourselves.

If a piece of carbon tissue be exposed behind an ordinary negative, and is then developed on a rigid support, such as a glass or a metal plate, we obtain a gelatine image in relief. The relief will be highest in the deepest shadows, and lowest in the high lights. With the proper exposure and development there will be no gelatine at all on the extreme high lights, and the gradation between them and the deepest shadows will be perfect. Now, if an electrotype be made of this relief, we get an intaglio image in copper; but, if we attempt to print from it, after the manner of copper-plate printing, we shall fail, as the ink will wipe out during the operation, owing to the smooth surface of the image having no ink-holding properties. A good printing plate, it may at once be explained, must not only have the image in intaglio, but it must also possess granularity, and the sharper that is the better will be the plate. Not only must the image be grained, but it must possess a stronger and a more pronounced grain in the deepest shadows than it does in the middle tints, while the extreme high lights must be represented by perfectly smooth metal, with no grain whatever. In fact, the finished photogravure plate may be considered as analogous to a mezzotint plate.

It may be well to explain here, for the benefit of those who are not familiar with the work, what a mezzotint plate is. Mezzotint engraving is done as follows: A plain plate of copper has its surface evenly roughened all over, except the margins, by working over in every direction with a steel tool having a sharp serrated surface called a "rocker" or "rocking tool." This treatment not only indents the surface of the copper, but at the same time raises a "burr." If the plate, at this stage, be inked in and printed from, as is done in copper-plate printing, it will yield an impression of intense blackness, and, if the work has been skilfully performed, perfectly uniform all over. On this rough surface the engraver forms his picture by scraping and burnishing away more or less of the burr and granularity from certain portions and leaving it on others. In the finished mezzotint plate the deepest shadows are represented by the work as left by the rocker, while the half-tones and lights are modifications by the scraper and burnisher. The closer a photogravure plate can be made to resemble a mezzotint one, the better will be the prints it will yield.

There are two systems by which a grain may be imparted to the gelatine relief. They may practically be classed as the chemical method and the mechanical method. The former, of which the Pretsch process may be taken as a type, consists in producing a reticulation of the gelatine film similar to that in the collotype process. By this means a discriminating grain is obtained which is coarsest in the shadows, is finer in the middle tones, and is absent, or nearly so, in the lights. The working of this process is, to a great extent, dependent upon the character of the gelatine used and the temperature at which the film is prepared. Some years ago Colonel Waterhouse published a method of producing a reticulated grain similar to that of Pretsch, but by an after-treatment. A carbon print, after it had been developed on a copper plate, was treated with an alcoholic solution of tannin. But here temperature, as well as the gelatine used for the carbon tissue, were in practice, found to be important factors in the process. Although the grain obtained by reticulation is a discriminating one, it is scarcely such an ink-holding one as is desirable, inasmuch as its edges are somewhat rounded and quite unlike the sharp grain or burr of a mezzotint.

Mechanical grain may be obtained in several ways. Goupil's method is asserted to be by using a "carbon" tissue containing a gritty matter. This gritty matter is said by some to be soluble, by others insoluble. But the details of their process, whatever it may be, like many others that are worked commercially, are preserved as a secret; therefore this statement may well be received with doubt. Printing through a grained

screen has been adopted; but it is seldom used for intaglio work, though it is largely so for relief.

Perhaps one of the best methods of producing a mechanical grain that has yet been published is that of Colonel Waterhouse. It is what is generally known as the Waterhouse process. This grain has the advantage of being a discriminating one, inasmuch as it is deepest in the deepest shadows, more or less shallow in the lighter tones, and absent in the highest light. The process also possesses the advantage of being simple in its manipulations, as the following brief description will show: A carbon print from a negative, after it has been developed on a copper plate, while still wet, is dusted over with fine sand or powdered glass. This sinks into the tender "jellied" film in proportion to its thickness, and, as the film dries and contracts, it seems to draw the sand still deeper into the film, and thus makes the grain sharper and more pronounced. When dry, the sand is brushed out or otherwise removed. Of course, if ordinary sand were used, it would adhere permanently to the film. But, in order to avoid this, Colonel Waterhouse adopted the happy expedient of previously treating the sand with stearine or wax; it could then be removed with comparative ease.

A modified method of working the Waterhouse process was introduced by Mr. E. W. Foxlee. Instead of using waxed sand or glass, powdered resins are substituted. Then, instead of removing the particles by mechanical means, they are simply dissolved out by a solvent of the particular resin employed. The advantage claimed for this modification is that, as the granulating substance is removed by solution, there is no danger of injuring the grain by friction, which is liable to be the case if the sand has been but slightly waxed. Again, when the sand has been sufficiently waxed to permit of its easy removal, the sharpness of its facets is in a measure destroyed. It can readily be conceived that by this method a crisper and better ink-holding grain may be obtained than with the waxed sand.

When once a gelatine relief with a discriminating grain of the right character is obtained, the production of a printing-plate from it becomes an easy matter by the electrotype process.

Tele-photography.—We are informed that the firm of Carl Zeiss, of Jena, are about to construct a simple combination to use along with their anastigmatic lenses for tele-photographic purposes, and they expect to furnish them in a few weeks.

The New Honorary Secretary of the Photographers' Benevolent Association. — We learn that Mr. H. Snowden Ward has undertaken the office of Honorary Secretary to the Benevolent Association. The fact of Mr. Ward being in constant touch with all classes of those connected with photography should be of great value to the Association.

Colour Sensitisers.—Those of our readers who would wish to possess such a knowledge of the various coal-tar colours manufactured in the past and the present as will enable them to master the intricacies of the eosine question, and become acquainted with the names of all the dyes that might be used in connexion with processes for making colour-sensitive plates, will find a mine of information in a new work recently published in Germany, *Tabellarische Uebersicht der Künstlichen Organischen Farbstoffe*, by Von Gustav Schultz and Paul Julius, writers well known to fame in this particular department. The work is, in effect, a tabulated catalogue of all past and present coal-tar colours, with complete references to existing literature on the subject.

Hand Cameras.—A correspondent inquires if we can give him any idea of the cause appearing to operate in reducing the number of detective cameras to be seen this year at seaside resorts. As to the fact that this decadence of the use of the instruments really exists, he states that he entertains no doubt. We can only say that it can scarcely be possible for us to give an explanation, if even the state of the case be correctly reported; but it is quite possible his may be simply a particular experience, conditioned by locality, weather, or chance coincidence. But, at the same time, we may be permitted to say that the sooner the name "detective camera" is given up the better for the status of photography. Numberless workers, who are gentlemen and ladies in the true sense of the term, use the instrument for pictorial purposes alone, but no terms can well be too strong to characterise the conduct of those whose aim is mainly not the production of pictorial records or pretty spontaneous grouping of figures with outdoor accessories and surroundings, but simply to minister to a low form of curiosity and to intrude upon privacy in a manner which is properly characterised as impertinent. We have heard of more than one case where the offending "cameraist" has met with his deserts with an argument straight from the shoulder of an indignant friend, while the offending instrument has been put ruthlessly out of court in a manner as effectual as violent.

Action of Water upon Glass.—Messrs. F. Mylius and F. Foerster have recently been making some researches into the action of water upon glass, from which they have drawn the following propositions, which they consider proved by their own observations and those of other experimentalists:—The solution of glass in water depends on a decomposition in which, in the first place, free alkali appears. The silica of the glass is secondarily dissolved by the free alkali. The constituents of the solution vary according to the conditions of digestion. The quantity of alkali which passes into solution from a given surface under given conditions is a measure for the attackability of the glass under these conditions. The attackability of surfaces of glass by cold water decreases at first very rapidly with the duration of digestion, and subsequently approach constant values. Different sorts of glass display a different persistence of the solution. The attackability of glass increases very rapidly with a rising temperature. The relation of the attackabilities of different kinds of glass depends on temperature. From glasses of equal attackability unequal weights may pass into solution. The attackability of good glass is decidedly decreased by a previous treatment with water. The worse a glass, the less its attackability is diminished by treatment with water. The attackability of glass surfaces is modified by "weathering." After treatment with water, surfaces of glass have the property of taking up alkali from the solutions which have been formed, and of giving it up again on renewed treatment with water. Potash glasses are much more soluble than soda glasses, but the differences disappear in proportion as the glass is richer in lime. In the substance of glass vessels, which are not readily attacked by cold and hot water, the lime, alkalies, and silica must bear a certain proportion to each other. Among the best known glasses plumbiferous flint glass is least soluble in water, but it is corroded at its surface and easily decomposed by acids.

The British Association.—The great event in the world of popular science at present is, as scarcely need be said, the meeting of the British Association, who meet in the same city that so hospitably entertained photographers in conference a short time before. In the address to the Chemical Section by its President, Professor Herbert McLeod, there occurs a portion which, in its possible application to the elucidation of photographic questions, may well be here quoted. Speaking of so-called catalysis, instances of which are so rapidly being explained away that he thinks the time may not be far distant when the term will be banished, he writes upon the influence of a small quantity of one substance upon interactions of large quantities of other substances, in which its action is explained as being catalytic, and says: "We have now many instances of the influence which small quantities of substances have upon chemical reactions. These influences may be more common than is generally supposed. The presence of a third body is frequently help-

ful in the combination of the elements with one another: thus, dry chlorine will not attack melted sodium or finely divided copper; an electric spark will not cause a dry mixture of carbonic oxide and oxygen to explode; carbon, phosphorus, and sulphur will not unite with dry oxygen; and, as chemical science progresses, we may find that many well-known actions are conditioned by the presence of minute traces of other matter which have hitherto escaped detection. We all know the profound alterations in the property of substances by minute traces of impurities: less than one-tenth per cent. of phosphorus will render steel unfit for certain purposes. The sapphire and ruby only differ from colourless alumina by the presence of traces of impurities hardly recognisable by chemical analysis. During this meeting we hope to have a contribution to the section on the influence of what may be called impurities in the properties of different substances and their influence on chemical manufacture." Now, we do not hesitate to say that photographic processes and the production of photographic materials, as all old wet-plate workers can better than any expound, offer examples far more critical, and involving quantities of far minuter proportions, than those indicated in the portion of Professor McLeod's address we have just quoted, and it is possible that light thrown upon this dark place of science may also illuminate equally obscure places in our particular branch of science.

Lightning Photographs.—In the current number of *Knowledge* there is a reproduction of a photograph of lightning, taken by Mr. F. H. Glew, of Clapham, by which the latter gentleman claims to have measured the duration of the flash. Mr. Glew has favoured us with a print from the negative, which delineates the ribbons of the main flash with remarkable distinctness. Mr. Glew supplies our contemporary with the following interesting details:—"The photograph was taken about 9.50 p.m., on Tuesday, June 28, 1892. The camera was pointed S.E. from the door, at 156 Clapham-road. The lens was secured to the hammer of an electric bell, giving nine complete vibrations per second, the amplitude being about ½ of an inch. It is evident that the main flash and its side forks all took place in less than the half of one vibration, and the motion of the lens separated the three component flashes, which to the eye would have appeared to be superposed. I compute from measurements that the whole discharge occupied about the one-twentieth part of a second, and the interval between the components about one-fortieth of a second. It will be seen that the right-hand side of each spark is fainter than the left, showing that the duration of each component was considerable, and not of the same intensity throughout its existence. The original negative shows this a little clearer than the print. Thomas's 'Sandell' plates were used, which, being thickly coated, in separate layers, prevented halation defects. Some of the shadows of chimney-pots are due to sheet lightning previous to the grand flash. The vibrations of the lens were in the same plane as the plate, and in the direction of its length. It will be seen that one portion of the flash is converted into chain lightning, this being due to the motion of the lens being almost in the direction of the length of this part of the flash, and in consequence of this the different curves have been more or less superposed in direction of length, in the form of a chain. I think this throws some light on the so-called chain lightning as seen by the eye, for, if the duration of a compound spark is so much as one-twentieth of a second, it is possible for the eye (corresponding to the lens of the camera) to move through a certain distance, and, if this movement of the eye opens to be in the direction of the length of the compound spark, then its components will be drawn out into a chain-like structure or complex ripple. Perhaps the duration may be even greater than one-twentieth of a second in some cases, and the eye may be set in motion by the first component of the flash. As the tendency of the eye would be to move in order to bring the object into the best position for distinct vision, so I think the effect of chain lightning might be formed in this way, or by accidental motion of the eye of the observer during the display."

AMIDOL—A NEW DEVELOPER.

Three months since we directed attention to the announcement of the discovery of a new substance—amidol—which was said to possess the remarkable property, when simply dissolved in aqueous sodium sulphite, of acting as a developer of the latent photographic image without the addition of an alkali. Messrs. Fuerst Bros., of 17, Philpot-lane, the London agents, have now placed at our disposal for trial a sample of the new reagent, which has been favourably reported on by Eder, Vogel, Stolze, Just, and other able experimentalists.

Chemically regarded, amidol is expressed by the formula

$$C^6H^3\begin{cases} O\,H \\ N\,H^2 \end{cases}2.$$

In appearance it is a grey, finely powdered body, not unlike powdered magnesium, freely soluble in water, and apparently unaltered by two or three hours' exposure to the air. The following are the recommended proportions of the stock solution which we made up:—

Amidol	20 parts.
Sodium sulphite	200 „
Water	1000 „

This forms a solution at a convenient degree of concentration, and, moreover, one that is colourless. In using the developer we diluted one part with five times its volume of water; but so rapid was its action, even with the addition of a grain of potassium bromide to the ounce, that we were compelled to still further dilute it down to 1:8. It is evidently a most energetic developer, particularly, as we practically observed, in cases of under-exposure, and yields negatives having all the necessary density and detail in a surprisingly short time. A further point in its favour is that it works cleanly, develops several plates successively with apparently undiminished rapidity of action, and does not appreciably change colour while in use. Its freedom from staining points to its utility for glass and paper positive work.

Amidol is decidedly a novelty in developers, and we hope to take a further opportunity of experimentally examining its properties and of stating them to our readers.

CONVENTION JOTTINGS.—III.

At Newhaven.—To lengthen the days that were all too short, some of us went down to the quaint old fishing village, Newhaven, in the mornings, where many picturesque studies were to be found, and not the least enjoyable feature of the visit, the fish breakfast supplied at the hotel, which is famed for its service in this way, some seven or eight courses of fish being served, and all most delicious and appetising, a most enjoyable finish to our morning's work. The Newhaven fishwife was rather a puzzler to some of our southern friends. One of them, wishing to have some fun with one of these sturdy maidens of the sea in the midst of his chaff, did not get the best of it, when, with a broad laugh, the fishwife exclaimed, 'Wha cau'd ye partin face, my lamb?' and, in answer to some other pleasantry of the youth's, she said, "Na, na, my man! y'er no gaun tai get a groat haddie for fourpence here!" Our friend gave it up in despair, he thought the woman was speaking in a foreign tongue. One of our party, who was going round with his camera catching up little bits here and there, was advised by an old fisherman not to be blowing up the harbour with his infernal machine.

The Land of Scott.—Unable, as we said, to form one of the Melrose excursion party, and enquiring of a friend who attended that excursion, he says:—"The day at Melrose was very dull, and, after taking one or two pictures, we thought we would like to go over and see Abbotsford, which did not happen to be in the day's programme. So we drove over, only to find that we were not allowed to photograph there; and, to get a picture of the house, with the river in front, we would have to travel round some five miles. We, however got a pitch outside the grounds which gave us a fair view of the house, and we managed to get a negative. On the way we took up two American ladies who were out touring. They told us confidentially that they had struck up a wrong day for Melrose, as they really could not see anything for photographers—swarming in every corner all over the place with their cameras—and that they had left the Abbey in disgust. At Melrose many of our company stuck close to the conductor, Mr. Hippolyte Blanc, who covered the ground, staying at interesting points, learnedly discoursing on the

architecture and history of Melrose and Dryburgh Abbeys; so that many who did not find the weather bright enough to continue taking pictures on plates found pleasure in listening to his sermons from stones."

Roslin.—We thought it rather strange when the announcement was made regarding the Roslin Chapel trip, to be informed, "But you are not to be allowed to photograph in the chapel." It seemed slightly out of place for the Convention to make a trip to a place where they were debarred from photographing the chief point of interest, but it seems the right has been sold to some large photographer, hence the reason. But, at such a time and for such a purpose, we think the right might have been waived for one day.

There must be a Mistake somewhere.—We overheard the following conversation: "Oh, Mr. Cembrano, you might sing us a song." "Oh, dear no, I never sing." "That's not so, you know. When at St. Andrews I heard you singing to yourself." "At St. Andrews," the youth replied, thoughtfully, "Surely never, I was not so bad as that! Oh, no, it couldn't be! that was the day I was drinking water." "Drinking water! what do you mean?" "Well, you see, Warnerke was telling me that he could photograph for a whole day and drink nothing stronger than water. I wanted to show him I could do it also. So I drank nothing that day but water. I could not sing on water, you know; there must be a mistake somewhere."

Does the Cap Fit?—When at St. Andrews we overheard a conversation that led us to consider that our worthy president posed as an impressionist of the first water. He was telling how, in the hurry, he had left part of his apparatus at home, and so was unable to photograph. We were wondering what part of his kit it could be that had been forgotten that rendered the impossibility to make pictures; but, seeing that the only part of his set that he had brought was the cap of the lens, we quite understood why he could not take even a pinhole picture. But the impression he left upon us was, that under the circumstances he looked himself a very pleasant picture.

By Road and Rail.—We were rather astonished to see one of our members (Anckorn) careering through the streets of St. Andrews on a bicycle, and more astonished when he told us that he had come all the way from Edinburgh on it, and further, that he was going right on to Arbroath (we think he said) that night. He was quite fresh and lively, and looked as if he enjoyed it. The train was good enough for the rest of us.

They didn't see the Point.—"What's the use of telling you a good thing?" said a humourist, at a post-Convention meeting, after giving a story that fell flat. "You never see the point!" "Never see the point!" exclaimed Mr. Bothamley, "and here have I been leading off the laugh at everything you've said to-day; you are ungrateful, sir. I must go work for other chestnuts."

On the "Columba."—It seemed as if many of the members of the Convention had found Scotland a pleasant country, as we found them in detachments for days after wandering up and down all over the place. Some days after Convention we found a contingent of them on board the *Columba*, and it would have done Mr. Hastings' heart good just to have got one good snap-shot at Mr. Kidd and Mr. Cembrano as they stood at the stern of the vessel, inducing the sea gulls to hover near by filling the foaming main with broken biscuits. We wonder how these bird pictures turned out. Mr. Seaman was on board the same day, and, getting on the right side of the captain, he was allowed on the bridge to photograph; he was so excited over his success in this matter, that he made, he said, four exposures without drawing his shutter once. Of course, that was a waste of time more than a waste of plates.

The Cramond Trip.—We got rather mixed at the Cramond excursion, although it turned out one of the most enjoyable of days. We undertook rather too much for one day, and the party got broken up, which did not help things. Some were taken to the village of Cramond, and some to the bridge; and by the time they met each other and had lunch the day was too far gone to get to Dalmeny and the Forth Bridge. We came quietly home, but a few of the party voted for the Forth Bridge and others for Dalmeny, which feat they accomplished; but it pressed them rather hard to be back in time for the Convention dinner. The open-air lunch at *this* outing was very enjoyable.

Snap-shots.—We have always been of opinion that snap-shot pictures, to be successful, require some little education, and that pressing the button is not a guarantee for a picture in all cases. We have had word from one or two of our friends, who promised to send us on pictures (if right) in which we took some interest, and in most cases failures from short exposures, too much stopped down, &c., &c., proving to us that the matter in hand has not had study enough. One of the best hand-camera workers we know was saying at the Convention that at the beginning of each season he works out his distances, say, six, eight, ten, or twelve feet, and practises on them till he is quite sure that he can judge correctly, and then he feels right for the season; and we feel that, if this is necessary for distance, so is it necessary for "time" and "stop" before the operator can fire away successfully.

REPORT OF THE DELEGATES OF THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION TO THE EDINBURGH CONVENTION OF 1892.

"Big Ben" was booming twelve when the tender conveying one of your delegates left the Westminster pier *en route* to the good ship *Seamew*, picking up on the way delegates from other societies. Your other delegate was found already on the *Seamew*, completing various arrangements made for the comfort of our party, which numbered ten, ladies and gentlemen. Off Greenwich we discerned friend Haddon quietly taking a shot at our passing vessel. We gave him a hearty cheer, regretting at the same time that he was not with us.

Time on shipboard passed pleasantly; what with deck quoits, cards, and discussions as to developers, especially the new one, "Rodinal," the spirited representative of which popular combination was one of our party. Indeed, so deeply were its merits discussed, that the very engines we fancied, seemed to say "Rod-i-nal, Rod-i-nal, Rod-i-nal," in their revolutions.

Many groups on board were taken; the captain himself, seeming to be rather fond of the operation, was posed several times. He also kindly "slowed down" when passing the "Bass Rock," and sounded the steam whistle, causing the gulls in thousands to fly off the rock, making a very fine picture.

At all times a gay and beautiful city, Edinburgh was certainly looking its best as your delegates approached its ancient port, and continued to do so, without a break, during the continuance of their stay.

At seven o'clock on Monday evening we assembled in large numbers to be welcomed by the Lord Provost, who, in the course of his remarks to us, referred in a most able manner to the great strides photography has made in recent years. He was followed by Mr. C. H. Bothamley, who, in the absence through illness of our retiring President, Mr. W. Bedford, introduced our new President, Mr. Georgs Davison, whose exhaustive address, coupled with his genial manner, was much appreciated by every one present.

Our first excursion, which was to Melrose and Dryburgh on Tuesday, under the leadership of Mr. Blanc, was most successful, particularly for the stand cameras, subjects being mostly of an architectural nature, and the light not being particularly good, it was not so favourable for the large contingent of hand-camera men, and so (and here let a mild protest be put in) they accordingly amused themselves by taking shots at unoffending groups of their fellow-pilgrims.

The drive from Melrose to Dryburgh, through the charming Lowland scenery, was most enjoyable, and a thing to be remembered. Our leader, Mr. Blanc, was most assiduous in pointing out the various beauties of the architecture, and coaching us well up as to the historical associations of both Melrose and Dryburgh. The post-Convention meetings on Monday and Tuesday evening were held in a large room in the Royal Hotel, kindly placed at our disposal by your popular member, Mr. H. M. Smith. Here toast and song, interspersed with anecdote, prevailed till the small hours, then came changing plates, and many and amusing experiences

could be related, particularly about the member who always backed his plates in his bedroom, in a very dim light, and found in the morning, on waking, that his night shirt, face and neck, to say nothing of the sheets and pillow-cases, had all been liberally treated with the same excellent mixture. "Whisky" was suggested as a possible cause, but the effect was not generally admired. After two or three performances of that nature, added to which, in some instances (when very bad), was the labour of washing the stains out, before leaving the bedroom, that member omitted to back any more plates.

On Wednesday morning a large party of hand-camera men, headed by "Poor little Mr. Brown," started off very early for Newhaven, to take "Fish Wives," and partake of "Fish Breakfasts;" both objects were satisfactorily attained, one gentleman owning to having exposed 24 plates within an hour on the former characteristic subjects; indeed, in such a pursuit, it is surprising what early risers photographic enthusiasts can be, notwithstanding the special licence granted by the Lord Provost and magistrates for the prolongation of our post-Convention conviviality at Daish's, and doubtless many characteristic pictures of Scottish fisher folk have enriched the collections of the number of hand-camera men who were "up in the morning early."

At the annual meeting at ten, it was decided to hold the next Convention at Plymouth, in 1893. The Council was duly elected, and then all adjourned to Princes Gardens, where Mr. Alexander Ayton had selected a splendid background of the Castle Rocks; with the assistance in grouping of our member, Mr. F. A. Bridge, a very fine picture resulted. A large battery of other cameras was also directed at the group, and we may hope to see results of all those other exposures in due time.

In the afternoon, a paper by Mr. H. P. Robinson, entitled "Individuality in Photography," was read by Mr. Hepworth. Another paper on "Photography in Relation to Painting," by Mr. Arthur Burchett, was read by Mr. C. H. Bothamley, in discussion on which Dr. Mitchell, of Philadelphia, alluded to quick exposures representing objects as the eye did not see them, the image on the retina never being shorter than one-tenth of a second, in proof of which he cited Professor Muybridge's pictures, as being so unlike what the eye really catches.

The President referred to Mr. Burchett's use of coloured glass with the camera when making exposures.

Miss Catharine Weed Barnes then read her paper on "Amateur Photography in America;" she alluded to the fact that far too many workers there, as here, begin and end with detective cameras, they procure one expecting that it will do every kind of work, and very naturally soon get disgusted; no one could appreciate photography at its full value till they had realised all the possibilities of time exposures. Miss Barnes also alluded to American workers not giving enough consideration in choosing a subject and to the poverty of her country in historical objects; she did not consider the clear atmosphere of America was so well adapted for general landscape work as the always blamed English sample, and claimed that American-made cameras were far more suitable than those of English make for use in her country; they were lighter, had more improvements, the plate-holders also were more compact and lighter. American sizes in both negative and lantern plates were the best. She also alluded to a violet-coloured lens for the truer rendering of half-tones to be used in place of the back combination of a rapid rectilinear lens, giving, with portraits especially, a remarkably improved effect.

In the discussion which followed, Mr. H. Sturmey said no doubt America was far ahead of England in the use of photography in certain studies, and for book illustrations, but he could not agree with Miss Barnes as to the superiority of American cameras, and the American slides might be lighter, but they were quite as bulky.

Mr. Howard Farmer's paper on the "Deficiencies in the Training of Photographers" was read by Mr. Cembrano. It treated the subject very cleverly from nearly every standpoint, and caused a large amount of discussion.

Mr. George Mason stated that, as to the limited supply of good assistants, the matter rested with the assistants themselves; so few tried to make themselves all-round men, contenting themselves with perhaps one branch, and even the use of one maker's lenses.

Mr. Bothamley then, by desire, opened a discussion on development. He stated that he had not found much difference in results between pyro and hydroquinone, and had not yet been able to find out any great superiority of pyro and soda over pyro and ammonia, or *vice versâ*. He questioned whether the greater softness in negatives claimed by the users of ammonia would not be due to general fog. He could not agree altogether with Messrs. Hurter & Driffield's theories, as he thought that the experiences of distinguished workers should be taken into account; if Messrs. Hurter & Driffield were right, then nearly everybody else was wrong.

On Thursday evening, Dr. Mitchell, of Philadelphia, gave us a most interesting paper on the "Colour Screen in Landscape Photography," which he considered indispensable for its power of materially lessening the difficulty of obtaining even and harmonious exposures; for both foreground and extreme distance he described a very simple way in which he prepared his own screens, and spoke highly of the great comfort in using celluloid films when on a tour, also remarked on the necessity of giving full exposures when using "ortho" films, stating that they would bear an amount of over-exposure which would be ruinous to ordinary plates.

In the discussion that followed Mr. Bothamley stated that he agreed with Dr. Mitchell that if was possible to overdo the yellow screen, and so yet a worse result than an ordinary plate would show; but he did not agree as to the necessity for such lengthened exposures. He had used "ortho" plates for shutter work with great success, using from *f*-8 to *f*-16.

Mr. Weir Brown said that pictures taken late in the day with ortho plates showed great advantages over ordinary plates. He found that, using them then, without the screen, they were one-half quicker than ordinary plates.

The President wondered why they were not more used than they were, for it was a fact that they were, comparatively speaking, very little used. He accounted for it, to some extent, by the different conditions under which they had to be worked, both in the field and dark room.

On Thursday morning the greater number of us went to St. Andrew's, and an enormous number of plates were exposed on the cathedral ruins, the old castle, and the beach and harbour, and the fine golf links. We were blessed with splendid weather, and it was acknowledged that the Edinburgh Committee, in selecting such interesting places for the outings, deserved the most unqualified praise. Some complained of the long distances that had to be traversed by rail; but the heated political discussion that generally arose, owing to the great victories the Gladstonians were gaining every day, seemed to make the train journeys less irksome, if sometimes they were rather noisy.

On Friday your delegates went to Cramond Bridge, securing some fine views there and along the river Almond, and in the evening the annual dinner was held at the Waterloo Hotel. It was attended by a very large number, the presence of ladies, for the first time, giving the banquet a most enjoyable appearance. Many were the toasts, and deep was the regret expressed that some of our most popular members had been unable to attend the Edinburgh meeting. The musical arrangements were under the management of Mr. George Mason, who eclipsed himself, and induced a number of ladies and gentlemen to entertain us by song and recitation.

On Saturday morning, at ten, the Council Meeting was held. Mr. George Mason, of Glasgow, was elected President of the next Convention, to be held at Plymouth; the accounts were passed, showing a balance to the good; and so ended the most pleasant and successful Convention meeting up to date.

It was very gratifying to your delegates to observe that at all the outings, and meetings, and dinner there were more members of the London and Provincial present than of any other Society, not even excepting the local (Edinburgh) Society), whom we must take this opportunity of thanking for the great trouble they had been put to in arranging all the excursions, luncheons, &c. To Mr. Blanc, the President, and Mr. Barclay, the Hon. Secretary, great praise is due, and also to many other Edinburgh gentlemen, who laid themselves out to amuse and entertain us; indeed, nothing was wanting on the part of the Local Committee to make the meeting what it has been—"a thorough success."

"Auld Reekie" has seldom been seen to better advantage, and the Clerk of the Weather was decidedly on his good behaviour.

On Saturday morning we all dispersed, many going north, amongst others your delegates, who went, *viâ* Callender, to spend a pleasant time at the Trossachs, then through Loch Katrine and Loch Lomond to Helensburgh, on the Clyde, and sailing down the estuary of the Clyde to the Isle of Arran, where more plates were exposed, and your delegates parted, one coming home by the west coast, and making a pleasant little jaunt into Tipperary, thence home *viâ* Southampton and Dover, having had a very enjoyable time on the water; the other delegate returning shortly after by the east-coast steamer.

R. P. Dradge.
J. Weir Brown.

JOTTINGS.

If Mr. Timothy Healy, M.P., and his friends have their way in the Parliament just opened, it may be necessary for the Photographic Convention of the United Kingdom to somewhat modify its title before

the Dublin meeting of 1894, since, in the event of the passage of a Home Rule Bill, the Kingdom will no longer be "United." Writing of the Convention, I am glad the Editor is to give us a reproduction of Mr. Ayton's group. If the print is up to the quality of last year's, everybody will be satisfied. In a picture of the group which one of your contemporaries gave its readers a few weeks ago, "Cosmos" comes out so badly that neither he nor his wife can trace any resemblance to himself in the figure which is meant for him. Please therefore, Mr. Editor, let that part of the picture in which I have a place be nicely printed, so that the partner of my joys and sorrows will be able to recognise me, and thus have to withdraw her furtive hints as to my having gone to Paris instead of to Edinburgh!

Although the term "detective camera" as applied to what is now generally called the hand camera, has fallen into almost complete desuetude, there was a degree of fitness and applicability about the original title which, in my opinion, so forcibly indicated the uses, or rather the abuses, to which it is too frequently put, that on the grounds of correctness of description I am sorry for the change. An unchartered private detective, such as Divorce Court and other cases limn for the public gaze, is a low, despicable being, and I have no higher opinion of the photographer who employs his "detective" or "hand" camera for a parallel purpose—that is, for securing records of the doings of persons in strange, unusual, and, perhaps, apparently compromising situations. I am glad to perceive that the editor rebukes a hand-camera correspondent for having photographed a group of men in a condition of semi-inebriety. Such a proceeding is, to say the least of it, uncharitable and impertinent. It is because I frequently see hand-camera pictures, which are undoubted outrages upon the privacy and freedom of movement of the individual, that I venture to protest against the impudent, thoughtless, and indiscriminate purposes for which the hand camera is so often employed. As a matter of strict right, I consider one person absolutely disentitled to photograph another without the latter's permission; but, when it comes to "snap-shotting" him under ludicrous, uncommon, or equivocal conditions, the hand camera is simply converted into an instrument of backbiting and scandal-mongering proclivities. So order, gentlemen, please!

What a lot of prizes that mysterious body the Amateur Photographic Association gives for competition among its members! I think I shall join it—for, to judge by the report published in your last number nearly, if not every, competing member secures a prize. I observe that Mr. W. Jerome Harrison was elected a member on July 27, and awarded a prize the same evening. How nice! I wonder what "Talbot Archer" will have to say of the Amateur Photographic Association, presided over by his Serene Highness of Teck, in the next number of *Anthony?* Something pretty, I'll be bound.

That negatives actually, as well as apparently, lose density in fixing is a contention both unsound in theory and not borne out in practice. The eyes of individuals are, doubtless, occasionally deceived over the matter, and so the conclusion is come to that some makers' plates "lose" more in the fixing than others (*vide* Mr. Albert Levy). Possibly; but to generalise that loss of density in fixing is therefore a common phenomenon is a fallacy. Mr. John Sterry's proposed method of ascertaining to what extent reduction would be likely to take place during the short time required for fixing negatives, by immersing plates of known densities in hypo for a given time, and then measuring the densities after immersion, is an admirable one; but why did Mr. Sterry keep his plates in the baths sixty and forty-eight hours respectively, and from the results conclude that the loss of density in half an hour must be slight; why not try the experiment for the average length of time fixation occupies, say a quarter of an hour? Nobody in his senses leaves a negative for sixty or forty-eight hours in hypo.

I see that, at a meeting of the Brixton and Camera Club the other night, the following question was asked: "For sea pictures, is it advisable to use a quick plate and a small stop, or a slow plate and a large stop?" and that "the meeting 'seemed' to favour the latter view." I should like to know on what grounds, and why the comparison was confined to sea pictures. Those gentlemen who preferred the slow plate and the large stop must have forgotten to bear in mind that, if the rapidity in both cases were equalised by the enlargement of the lens aperture employed with the slow plate, a quite different kind of image as regards definition would be obtained. I assume *f*-11·3 and *f*-45·2 as being the large and small stops respectively, which would mean that the rapid plate would require to be sixteen times quicker than the slow plate. COSMOS.

THE INACCURACY OF DESCRIPTION OF PHOTOGRAPHIC OBJECTIVES BY MANUFACTURERS AND EDITORS.

[American Journal of Photography.]

BARRING the last two words, the above is the title of a paper by Mr. W. A. Cheyney that particularly attracted my notice in your issue for April. The paper is to the point, and is on a subject that ought to be thoroughly ventilated.

OPTICIANS AT FAULT.

Put briefly, the matter is this. A number of opticians make lenses especially for photographic use. Many of these lenses are, considering the conflicting requirements of a photographic lens, so good that they are a standing wonder. The opticians charge a pretty stiff price for them, but of that we, the buying public, do not complain. We ask, however, if it is not unreasonable to demand, that the descriptions of these lenses, in catalogues and advertisements, be at least fairly accurate, that they be not disfigured by a lack of intelligence that would bring ridicule on the advertisement of a tailor or shoemaker.

It is probable that the catalogues and advertisements of most manufacturers of photographic lenses are a relic of the time when the greater number of photographers were ignorant of the most rudimentary facts, not only of optics, but even of the properties of the lenses they used; when anything about the ratio of aperture to focal length was a mystery profound, when it was commonly supposed that there was some fetish in a "portrait lens," apart from the angular aperture, making it particularly suitable for portraiture; when, particularly, there were wonderful delusions about depth of focus, when, in fact, it would have been useless to afford the information now so generally demanded.

There are exceptions to every rule, and there are some (English, at any rate) opticians who issue catalogues giving all the information wanted. I think of one in particular who sends out a large sheet giving the equivalent focus and the maximum working apertures of all the different sizes of the different classes of lenses that he makes. I know, too, that with this optician the actual equivalent focus is always very nearly that stated in the sheet, that the apertures are actually those stated, and I believe that, if a lens of precisely the focus mentioned is wanted, the fact has only to be stated.

How different it is with many opticians was forcibly brought to my attention a little time ago. My advice was asked about buying lenses for a particular kind of work. I soon decided on the class of lens wanted, but it was necessary to determine from whom the lenses should be ordered, and hence a great rummaging through catalogues. It was quite essential to know the equivalent focus and also the maximum working aperture before ordering the lenses. Now, in the catalogues of three English opticians of high repute, there were found the following anomalies. One gave, throughout, the equivalent focus of the lenses, but nowhere stated the working aperture. Another gave the equivalent focus of the lenses and their diameters, accompanied by diagrams showing that the working aperture was in most cases much less than the diameters of the actual combinations. In the catalogue of still a third optician, there were given, for some lenses, both the equivalent and the back focus (almost a work of supererogation), for others the equivalent focus only (just what was wanted), for still others, merely the focus. In this last case, it was only actual experience of the lenses that enabled me to know that it was the back focus that was stated. It is some slight consolation to think that these opticians lost all chance of at least one order, simply from the idiotic way in which their catalogues were put together.

There are other offences committed by manufacturers of lenses. Why, for example, should the intelligence of the photographic public be insulted by advertisements of wide-angle lenses headed, "These lenses include an angle of more than 100°," whilst below there is a table of the sizes of plates that the lenses will cover with "large, medium, and small stop," which table shows that the lenses will not include an angle approaching 100° even with the small stop, and taking the diagonal of the plate into consideration?

As for lenses not having the apertures advertised, I think that perhaps English opticians are a little more conscientious in this

matter than Americans, although I can be by no means sure. Very often, where "aperture" is mentioned, or is inferred by stating that the angular aperture is so-and-so, and giving the equivalent focus of the lens, it is found that the diameter is actually that of the glasses of the lens, and that the cell cuts it down very appreciably, or that a fixed stop contracts the working aperture. In judging of the latter matter, however, it should always be borne in mind that, in the case of double combination lenses, the fixed aperture may be a little less in diameter than the front combination without cutting off any light, because this light is somewhat concentrated by the front lens before it reaches the stop.

There has been a great improvement amongst English opticians within the last few years in the matter of the accuracy of cutting stops. It is not so long ago that they were cut at pure random. Even for some time after certain opticians professed to have adopted the Universal Standard, the stops were seldom even approximately in accordance with it.

"Editors and Lenses."

Now for the editors and others who write in the periodical press about lenses. To the like of myself, living thousands of miles from the nearest place where photographic lenses are made, it is of the first importance that the descriptions of new lenses given in the photographic periodicals should be intelligible. Sometimes they are; but, alas, how often they are not! By the same mail that brought the issue of the *American Journal of Photography* above mentioned, there was brought a copy of an American contemporary—a journal that I value much, because it is edited by two people of talent, and the reading matter is generally excellent.

Under the head of "Editorial Comment," I came on a paragraph beginning, "An improved lens." This at once attracted my attention, the more particularly as, after a few preliminary remarks on the "wonderful discoveries made in optics and chemistry," it was stated that the lens is made of the new Jena glass. Now, I particularly want to know something definite about the results of the use of the new Jena glass for photographic lenses. The next statement, however, is, to say the least of it, confusing. It read that "it is made . . . . single, rapid, rectilinear, and wide-angle, and does, as the makers claim, work with full aperture, sharp to the edges of the plate." This remarkable statement wants a deal of consideration. Is there actually one lens that combines all the qualities here mentioned—that is, at the same time, "single, rapid, rectilinear, and wide-angle?" Although there is nothing in the "Comment" to clearly indicate it, I am forced to suppose that there are three different kinds of lenses, because, for one thing, I imagine it is impossible, even with the Jena glass, to make a lens having all the qualities indicated above. What on earth use it is to know that "it . . . . does . . . . work, with full aperture, sharp to the edges of the plate," without any statement of focal length, maximum aperture, or size of plate, is a thing that I leave to your readers.

A little lower we learn that "those of long focus are something like the new lens of Dallmeyer, which is making such a sensation abroad." One is inclined to interpolate, "Something like a whale."

But at this stage comes the most interesting part of the whole description. We learn that "the great value of the lens lies . . . . in an attachment which can be put in place of the rear combination, and produces actinically modified rays of light, thus reducing harsh contrasts, and obviating in portrait work the necessity of retouching. The results as described are remarkable, and give much the same effect as orthochromatic plates." Remarkable! I should think so, with a vengeance! A lens obviating the necessity of retouching, and giving the same effect as orthochromatic plates!

Leaving on one side the extraordinary property of a "rear combination" that can "produce" rays of light—whether in the vulgar sense of originating, or in the geometrical of extending in the same straight line—what in the world can this attachment be? At first it seemed to me that it might be a diffusion of focus arrangement, although it is difficult to see how that could give "the same effect as orthochromatic plates," and I hailed the information with pleasure, for a landscape lens with a diffusion-of-focus arrangement is still a *desideratum*. What comes farther on seems, however, to contradict this idea.

It presently transpires that "we have only tried the ordinary rapid rectilinear, but have ordered the violet light attachment." Angels and ministers of grace defend us! What does this mean? I thought that all the lenses, if there were really three of them, were not ordinary, but extraordinary, particularly considering that "those of long focus are something like the new lens of Dallmeyer." Then, if only "the ordinary rapid rectilinear" was tried, how about the implied evidence that it, this three-in-one lens, in all its forms was found to work with full aperture to the edges of the plate "as its makers claim?" But the "violet light attachment" beats all.

For the nearest approach to definite information that we have in the "Comment" is that "Miss Barnes will probably use the lens in her European tour the coming summer."

Surely we may demand with reason that the manufacturers of lenses shall describe their goods a little more intelligently than they do, and that commenting editors, unless they can tell us something more definite about lenses that they have tested than do these referred to, should hold their peace.

Over the editors we have no control. Over the opticians we have to a certain extent, and I suggest that all photographers should do what they can, by promptly returning lenses that are not in accordance with catalogue description, demanding either a return of their money or a lens that is in accordance with the description. Farther, that, where other things are equal, they give their custom to those opticians who issue intelligible catalogues, and whose goods are found to be in accordance with their advertisements.

W. K. Burton.

ADVANCED PHOTOGRAPHIC WORK FOR AMATEURS.

VI.

In a former article I referred to platinotype printing on cloth, materials for which are readily procurable from the Platinotype Company, and no sooner will an enthusiastic worker have entered fully into and enjoyed the satisfaction of what may justly be termed an uncommon phase of photography than most probably he will fly at higher game and long to produce his own printing material. In so far, however, as the production of sensitised nainsook, or other similar material, in platinotype is concerned, I fear there is but little prospect for any one not thoroughly conversant with the intricacies of the process ever being able to successfully prepare this in an amateur manner.

There are, however, other methods of printing on textile fabrics which an enthusiast may with ease undertake in the knowledge that perfect results can be obtained. These are sensitising the fabric by silver, or practising what is termed the blue process. Most exquisite results can be obtained with the latter, and the entire operation may be conducted without any great outlay or acquisition of any special apparatus. As I have said previously, the first necessity is a suitable negative, without such no success can possibly attend any attempts at printing on cloth. Having, therefore, a bold, vigorous negative which possesses clear glass in the shadows and strong density for the high lights, an amateur may, however, set about the work with the utmost confidence. In selecting a suitable fabric, there are quite a number of materials at hand in any lady or gentleman's wardrobe with which a start may be made, to wit, a good linen pocket-handkerchief; let it, however, be a good thick one. This is first washed, and all soap and other matters carefully rinsed out; it is then well ironed without being folded. The next operation is the preparing of the surface of the handkerchief with a partially insoluble solution of gelatine, whereby the sensitising solution, which is afterwards to be applied, is so held *in situ* as to yield a good print when exposed in the ordinary manner in a printing frame. This gelatine solution is prepared by dissolving fifty grains of gelatine in twenty ounces of hot water; when dissolved take into the dark room and add to it thirty grains of bichromate of ammonium dissolved in an ounce of water, stirring vigorously. Keep this in a stone bottle.

Let it now be supposed that it is desired to print a portrait on the corner, centre, or any other portion of the handkerchief. Whatever part be chosen is carefully marked off with the aid of a soft lead pencil (let us suppose it to be the centre). The handkerchief, previous to the application of the gelatine solution, is carefully laid down on a clean sheet of glass or other suitable support, and then, by means of an oval, round dome, or any other suitable shape, the exact spot is marked with the pencil (a very convenient round shape may be had by using a saucer or wine-glass). The handkerchief, after being pencil-marked, is stretched drum-tight over a common school slate (if you are not a good hand with the needle yourself, get a lady friend to do it for you); now, with a tuft of cotton-wool or clean flannel, in the dark room, swab well the part marked with the pencil with the gelatine solution, and set aside to dry in the dark. Now get a large sheet of black needle-paper, or, what is better still, stiff, blue sample paper (the latter cuts better, not being so fibrous), place the same flat on a sheet of glass, and with a narrow-pointed penknife, using the same round shape, cut out in the centre (or wherever it is required) a nice, clean-edged mask; try and get the edges free from jags (the blue sample paper, being nice and hard and crisp, will permit of this being done, provided a very sharp knife is used). This cut-out centre, with its large margin (the entire sheet of paper), is

pasted carefully on a 15×12 sheet of glass, or sometimes smaller sizes may be employed, but a large frame is more convenient.

When the handkerchief which has been swabbed with the gelatine solution is perfectly dry it is folded so as to be capable of being placed in a 15×12 printing frame; the circular pencil mark will now correspond with the cut-out portion of the mask, which is a fixture on the glass of the printing frame, and in a room lighted by ordinary gaslight the prepared portion of the handkerchief is so adjusted that the pencil lines correspond with the edges of the mask. The back of the printing frame is then placed over the handkerchief, the springs tightened, and the handkerchief exposed to sunlight for several minutes, say about five. The next step is the preparation of the blue sensitising solution.

Get two stone gingerbeer or stout bottles, and in 8 ounces of water dissolve 830 grains citrate of iron and ammonia. (Label, No. I.)

In 8 ounces water dissolve 600 grains ferridcyanide of potassium. (Label, No. 2.)

These solutions are not to be mixed until immediately before sensitising. The handkerchief and the solution must be kept from the light.

The operation of coating the linen fabric had better be delayed till nightfall. The handkerchief is then stretched out flat by any convenient method, and the portion marked with the pencil is then well swabbed over, using a piece of flannel, with the sensitising solution mixed in equal parts of No. 1 and No. 2.

The handkerchief is then set aside to dry in a dark room. This is conveniently done in a warm kitchen just before going to bed, but care must be exercised that it is removed before daylight.

The handkerchief is now ready to be printed. Let us suppose it is a suitable half-plate negative that is about to be used. I have always found in practice that when such large articles as handkerchiefs, or in cases where the sensitised portion of the fabric has not been cut off in suitable sizes to fit small-sized negatives, that it is advisable to use as large a frame as possible for the purpose of printing, therefore a 15×12 size at least ought to be employed. I have known a pupil of mine bring into requisition an oak picture frame having a good thick glass set in it, but a good printing frame is the correct thing to employ. The 15×12 sheet of glass upon which has been pasted a cut-out black mask, of the same shape, but slightly smaller than the negative, is inserted, and then the negative is carefully laid over the cut-out portion, and fixed in position by binding the edges to the glass with strips of gummed paper. Pieces of cardboard of the same thickness as the glass of the negative are then placed on the large sheet of glass so as to pack the negative as it were. This is done to prevent any liability of the glass to break when the springs of the printing frame are tightened up.

As a rule, this class of printing is best done with the aid of suitable masks laid over the face of the negative, but such can be vignetted if desired. When amateurs are merely printing small-sized negatives, say not over whole-plate in size, any photographic dealer will supply cut-out masks from lantern up to 8½ × 6½ sizes, and these in all shapes, including ovals, domes, squares, &c., &c. When the negative has been fixed on the printing glass a suitable cut-out mask is placed over the face of it, and fixed by means of slight application of gum to the corners. All is then ready for the printing operation, and the handkerchief is then placed so that the sensitised part occupies its correct place on the negative. As a rule, very full printing is desirable, and now will be seen the need of using only such negatives as are bold and strong in contrast. When fully printed, the handkerchief is taken and washed in clear *cold* water; this will remove the unaffected gelatine, and develop out the picture. Don't be afraid to wash well if you have properly prepared the gelatine solution and exposed same to sunlight, the image will stand good washing, and be all the brighter and cleaner for it.

In reality, there is no difficulty in this class of work, and I have known ladies and gentlemen who have derived more genuine pleasure from producing one good print on linen than fifty on paper.

T. N. Armstrong.

MARINE PHOTOGRAPHY.

Too little attention is, we think, says *Anthony's Bulletin*, given to marine photography. True, we have seen many dismal failures—black hulls sailing on a mingled sky and ocean of such dazzling brightness that sails, masts, and ropes were but theoretical and paltry accessories, faintly suggested by certain dim and ghost-like outlines. On the other hand, views of such entrancing beauty and clearness have been submitted to us, showing the results of proper care in composition and lighting as to make it a matter of wonder how such dismal failures as those first referred to could have been produced when all necessary materials for such perfect pictures were at hand. It is with the view of giving some fundamental principles necessary to success in this direction that this article has been written.

A hand camera is, of course, well-nigh indispensable for this sort of work, both for the sake of portability and by reason of the fact that instantaneous exposures are here the almost invariable rule. As to lens, nothing, to our mind, can exceed an ordinary single-view lens, focussed for a distance of, say, fifty feet. In this way an extended sea view, even while including a generous foreground, will not be lost in mistiness on the horizon, and an effect similar to the indistinctness of a portrait background will be avoided.

For yacht views pure and simple, a wide-angle lens is preferred by many, depth of focus being in this case secondary to crispness of definition in the centre of the field. A rather large stop, with excessive speed of shutter, will be found to give, perhaps, the best results, as, in a brisk breeze running free, the velocity attained by one of the crack yachts is by no means something to be despised or overlooked. Couple this with the fact that, in many cases, the standpoint of the operator—often a naphtha launch—is violently pitching, as well as moving ahead at the rate of ten miles an hour, and it will readily be seen that quickness of exposure is everything.

By all means use a shutter with a pneumatic release. It is almost always necessary to make the exposure on the instant, or the chance is lost. A quick, sudden pressure on the button is almost certain to seriously jar the camera, while a vigorous and impulsive squeeze on the bulb is free from any disastrous effect. Brace yourself securely against the gunwale of the boat (if it is high enough), and you will often avoid an ignominious tumble, broken camera, and a magnificent expanse of cloudless sky on the plate, where you vainly hoped to see bulging canvas, straining ropes, and prow half buried in foam from that big billow which was the cause of your own downfall.

The objection may be made, that an enthusiast is needed for this kind of work, together with a camera endowed with qualities nearly approaching those of mackintosh. Even granting this, we say that such a combination is easily to be found, and, when working in unison, it will produce a collection of views in which gracefulness and vigour of action are combined in a manner impossible with any other class of subject.

The lens should, if possible, be shielded completely by the shutter; this will prevent the spray from injuring, for the time being, its picture-making qualities. Avoid bright metal-work on your camera, lens, or shutter. Have all blackened, and as little of it as possible, to avoid the corrosive action of the sea water. A hard-rubber shutter is best, as it is less liable to stick when wet than any other kind. Of course, we have chiefly depicted a rough-weather experience, knowing that the trouble and wetting will be amply compensated for by the results, these, to our mind, being far in advance of any mirror effects, so far as yachts are concerned. Not that we wish to be understood as decrying the merits of the beautiful reflection work so often seen; but something full of vigour and snap, showing Neptune in his wilder moods, is preferable to a tranquillity, which, while beautiful and suggestive of the fabled lands of the lotos-eaters, is more suitable to a landscape than a sea view. A roll of film is preferable to anything else in this case. Often you will pass a yacht and then another in quick succession, too quick to change your plate-holders, which perhaps are wet, and the slides stick. Or you want two views—one approaching, and the other receding. With plate-holders you can, of course, get the first, but by the time you are ready for the second it is just tantalisingly out of reach. Besides, the illumination is almost always intense, and many a fogged plate will result from a hurried and careless withdrawal or replacement of the slide.

The lighting in a marine view is all-important. Remember that the sky in your picture will be a dazzling white background, unless filled with clouds, and a white sunlit sail will not show up against it with anything like the distinctness apparent in looking at it in nature. Again, the water is a powerful reflector, and, though apparently dark in colour, will, under a noontide glare, come up in a developed negative almost, if not quite, as dense as the sky above it. Have your camera so pointed that the sun is to your right or left at an angle of about 45°. By so doing, ropes, sails, and hull will be thrown in partial shadow, and ensure a contrast in your finished print which would otherwise be woefully lacking in this respect. Make your exposures in the morning or afternoon rather than at noontime.

Never take a beam view of a vessel with her sails trimmed flat as boards; there will be neither life nor action in it, and the mass of white, if brightly illuminated, will be scarcely distinguishable against the high lights of the sky and water background. Even with a cloudy sky, and but little direct sunlight, there will be enough reflection for a quick exposure, and a full light on sails and hull will then

give both contrast and detail. Under any other conditions, it is better to have the sails in shadow, or, at most, but partly lighted.

Almost any good developer will serve for marine exposures, but it should not be used full strength, as with snap-shots on land; otherwise plenty of detail, but insufficient density, will result. Develop slowly, and with rather dilute solution to start with. Hydroquinone is especially adapted for use here, as the image comes up slowly, and with plenty of density.

Beware of over rather than under-exposure, as it is hardly possible to fully realise the immense amount of added light, due to reflection, in a seascape. It is usually possible to make a satisfactory instantaneous exposure, even on an overcast day, on the water, and many prefer for development the iron and oxalate solutions so largely used on the continent of Europe.

Pretty moonlight effects can be obtained by having the light shining directly in the camera, making a short exposure, and developing for density. In this case a film is again preferable to a plate, owing to the freedom from halation in the negative produced.

We have made no mention of surf or combined shore and sea photography up to the present, but, properly handled, these subjects are capable of producing grand results. Bold masses of rock in the foreground, over which huge swells are breaking, can be made most effective use of. Have the rocks, if possible, in shadow, and the sun at a right angle or rather more to the direction in which the camera points. The crest of the waves will then reflect the light, while the reflection from the main body of the water will be avoided, and the true effect of the dark billow breaking into white foam along its crest will be obtained.

The extreme dampness and corrosive properties of the atmosphere at the seashore must be taken into careful consideration. The metal parts of the camera will rust and stick if not carefully watched. If plates are used, unusual care must be taken not to touch the sensitive surface, as finger marks will surely result. This applies to films as well.

Have hard-rubber slides to your plate-holders, if you would avoid sticking and jamming, and the consequent loss of many a picture. Your woodwork is liable to stick, and tight fits become impossible ones when exposed to long-continued dampness.

But, with all this appalling list of drawbacks, the enjoyment of one good yacht race, and the collection of negatives that care to the details of lighting and exposure will give you, will far more than make up for the incidental wettings and mishaps that may fall to your share.

PHOTOGRAVURE.

Photographic Society of Great Britain.]

This subject presents itself to the mind in a changing aspect as time goes on. Indeed, most things do. The early stage has a different air from that of progress or maturity. A romance and a feeling of expectancy gradually changes into a critical and judicial attitude.

That which most induces this thought is the immense thing that photography itself has become. In nothing has the expectant aim and that anticipatory joy of the mind in the future achievements of our sciences been so marked as in photography and its artistic aims. It is too great a diversion to even name the leading branches of the art-science and their relation to our aims and desires. But it is worth while to give a definition of the aim of all photographic art as "that which can autographically place on record all that can be seen with the eye, or that might be seen if we had powers as great as our methods or chemicals," as these go so far beyond the optical power of the visual organs. When a photograph not larger than a halfpenny shows 50,000 stars, one, of course, is bound to wonder greatly at the result: fifty years ago it would never have been dreamed of. The bare idea that we should ever be blessed with such an all-potent thing would simply beggar the mind of any one living one hundred years ago.

This it is which puts each of the branches of photographic art into line. Photogravure is only one of the very many and growing methods of making a photographic picture. And the operator of one method—such as collotype, for instance—is as far removed from the one who takes a portrait as possible. The many details that belong to each and every branch quite separate them, and so separating cause the whole to spread out in one enormous field of work that few of us ever consider as a whole. It seems to me impossible for one man to grasp all the multitudinous details of every branch of the photographic art. Those details constantly expand; from year to year new details are introduced and discovered, and it is quite impossible for one mind to master all of them.

Of general remarks I will only name one more; it is that concerning progress. One can never try, or learn, or practise too many details and methods in the particular branch that you study. The steady working of a formula is very well, but the vast accumulation of trials and failures recorded in the mind, or in some more tangible form, go steadily to make progress, because one or another *long-disused method*, combined with *new materials* and in a *new way*, produces a new discovery of great value. The very wrecks of the past are sorted over, and morsels picked out to find out an important place in some grand new method. I apologise for this long introduction, but a great respect for the workers of the past, and also of the present, compels this form of acknowledgment. To how many workers living and dead is the photogravure operator a debtor; and how many apparently insufficient things are brought forward to produce better results now. This is the leading idea which I would emphasise, for it is the golden thread of future victories in this and every branch. We appreciate, of course, the charm of an old ruin—there is nothing like it. An old ruined abbey adds a quite peculiar grace to an English landscape; but it could never have existed had there not been a most expensive building to ruin, and the charm would never have been there had there not been an enormous expenditure of time and labour in producing the delicate tracery. You must view the work of those men before us very much in that light. Dr. Hunt, of Redruth, Cornwall, was such a worker. His knowledge and patient care in studying the physical phenomena of light met with but little reward, you might say, in his time; but he lived long enough to see a great many results, and he was one of the noblest workers of his time. Our results at the present time largely follow from the work of men who have been a good deal less fortunate in seeing those results than Dr. Hunt was.

The "Main Aspects" of Photogravure.

Photogravure presents itself to my own mind in three main aspects:—

1. Its economic aspect as regards "cost," "outfit," "speed," and their bearing on the different classes of published matter.
2. Practical aspect, methods of production and relation to the class of work in hand, together with all technical details.
3. Suggestions for the future, and particularly as to new openings.

The economic or the practical aspect would, either of them, furnish enough points for a long essay; but I will run quickly through the principal ones in each case. In the paper which I had the honour to read before the Society of Arts some years ago the economic aspect was only touched upon. This time we will look into it more fully.

The first and most important item on the economic side is that of printing cost. The limitations of printing cost are almost as well fixed as those of getting coals, or any such service that you can think of. For printing we employ a class that we find ready to our hands: the copper-plate printer of many years' standing is our printer, and thus we are in front of a standard cost in production which cannot vary very much; and the chief point that one ever notices is the greater or less ease with which one or another plate can be printed, thus getting more prints in a day from an easy-printing plate than a difficult one. One plate must cost sometimes twice as much to print as another, and yet to the public and the customer is apparently no different, and they say, "Oh, why should you charge twice as much for this as for the other?" But, if you do not, you will lose; you cannot help it. Mezzotint engraving is very slow to print, and photogravure, if it is of that full nature, is also slower to print; but a slight, sketchy effect, however catching, is quicker to print. The mezzotint is the slowest of all methods to print. The little impressions in the old mezzotint are something like V. Big and little, big and little, all of a certain shape. Now, a V-shaped impression does not hold so much ink as U, the cavity is not so capacious; if the points go off a very little bit, the cavity has still less capacity. Yet there is one charm of the old mezzotint which we never can get; when it is scraped away to produce a light tint, you retain those little punctures. Now, processing, in so far as I have seen, is unable to produce that detached puncture for the light tint. That little puncture, producing comparatively widely separated dots, gives a large area of perfectly clean paper; thus the lights of a mezzotint are more beautiful than the lights of our process plate. The process plate has a tendency to be like ~~~~~~~~~~~~~~~~ in the light—it does not matter by what method the plate is made—and the consequence is there is not much clean paper between them. The colour is easily got out by the press, but it is not clean work. Then, if you scrape it out with the scraper, it is a very clean white; but with the former it goes in a sweet way, leaving a little bit almost to the last. The necessity with regard to the mezzotint plate is that V, not holding so much ink as U, requires very stiff ink. The man has to grind that ink till it is as stiff as putty; and, when ink is as stiff as putty, it takes a good deal of patience to clean it off, leaving a nice layer all through the plate so that it may print full and nicely, because, if it is not stiff, it comes

out of the cavities and will not print a dark tint. Now, we have good deep cavities, and with a comparatively thin ink we can leave enough to print a dark tint. Consequently, the photogravure print is economical to make. You have to remember that the old plate is more expensive to print than any chemical plate that we can make, so that on that ground you can talk to the old printers and say, "Yes, they are expensive; but they are not so dear as mezzotint plates." Having now shown the mezzotint plate to be a hard plate to print, we go off to another point. The cost of printing and paper seldom gets much below one penny per impression for ordinary sizes. (We pay 8*s.* for the portfolio size, which is about *Art Journal* size, ten inches long. That costs a penny per impression for labour only in printing. You have to remember that engravings would cost five or six times as much; they must print 7000 to 10,000 to make it down to a penny per impression, to pay for the plate—in fact, I could have shown you a plate which cost 100*l.* to make. I suppose there would be 3000 or 4000 printed from it; but, of course, that does not pay 100*l.*, except at several pence. When you go piling on the pence, then comes the difficulty with the public; they do not see it.) And when for a penny paid out you have, according to the modern economic situation of the bookseller, to charge the public twopence, it is easily seen what a charge this becomes. This is the greatest drawback, economically, to photogravure. Many a job is done by the collotype method because it has a low cost for the first print made, while photogravure is high; but, for a record, collotype depends on its negative, which is more frail than the costly copperplate, and therefore unsuited to a standard edition of a book. Of course, you could with collotype go back to one impression and say, "That is a record." But I dare say you all know how "process on process" degrades the result. You take a photograph from a photograph—it is so much—behind it. It is better if you can go back to a standard that you can depend upon.

Methods of Economising.

For a book of small or moderate size the old method of grouping four subjects on one plate is good; for one pull of the press, and just a little more time at inking, produces a lot more prints, and the printing cost can be brought down to, say, half of the former figures. The cost of making the plate with four pictures on it is, however, no less per subject—probably more.

Another method is by printing several subjects quite close together on thin China or Japan paper, and then cutting up the sheet by hand and inserting where required. This, though not economical to the extent one would wish, opens up methods of accommodation of great value. Thus prints may be made long before the book is ready, and they can be used for any purpose or book by simply pasting them down. You can put the prints by for years, and when the list is complete you can print the book. The book is printed with the blanks, and that work is cheap; but, if you try to print in these blanks from the press, you would find it extremely expensive. We have tried it for a Scotch publisher; but it was no use, it could not be done. The best way is to print on very thin paper—China paper preferably—and then paste them in. You cannot put a thin paper through the press and expect it to print. You have to put a piece of thick paper at the back, and then it will take the ink.

The printer has to use a backing of thick paper to get a proper impression on the thin, so that economy is not apparent unless five or six are on a plate; and, if they are neatly brought together, they can be cut up for a trifle. Then comes inserting or mounting, for which no great skill is required, so that you can get very cheap labour—girls, for instance—for it. Drying the sheets flat is yet another expense, and it seems either to want redamping to do this, or to have them already damp when the pictures are inserted. This all costs something, yet with a willing staff and a good shop it is inexpensive and certain.

The large work by W. J. Linton, a copy of which is here, is got up in this manner, the subjects being grouped on the plates and then printed on thin China paper, and so cut up and mounted. The same method may be used for the many little elegancies which are now so much in vogue—memorandum cards, birthday cards, &c., subjects being stocked in a cut state ready for mounting on cards or leaflets, of any size, or shape, or kind. Collotype, of course, gives some idea of copper-plate work: but, unless it can be printed on the thin paper and without any gloss, it cannot have the rich, velvety character of an intaglio print.

The great point is that, however thin the paper, you can get the rich effect of the print upon it; there is no inferiority. (The pictures in the *Life of Samuel Palmer* were quoted as an instance.)

I have dwelt rather long on this branch, because of its true importance, it being charged in every phase with questions of economy and the balancing element of quality, how much quality to how much money? That is the question for to-day in every business.

Speaking before photographers, I may record my surprise that photogravure portraits are not more commonly made use of as presentations where a large firm employing numbers of persons desire to remember an honoured employer by executing a plate of his portrait, and using the copies as the presentation. Many similar purposes suggest themselves, the favourite secretary or chairman of some association, not to speak of ladies of similar eminence, head masters and principals of schools and colleges, officers, captains of ships, &c. At present we have heard of Members of Parliament doing something of this kind, but it might go further with great advantage.

Art Aspects.

The failure of so much of the old copper and steel-plate engraving follows rather from the business demand than from the artistic, or, at least, it is equally divided. Cheapness was called for, and photogravure plates of a fair quality can be made cheaply, but they cannot be printed cheaper because the process is identical. Line engravings in steel are printed very cheaply, because a clean surface is all that is desired and steel easily yields it, but steel engravings are slow and hard to produce. Copper etchings are not so hard to produce, but even when steel-faced they generally give trouble through being finished with very fine work. Mezzotint costs a deal to print, but here is the closest rival of photogravure, and it costs, say, twice as much to print as the photographic rival. The artist's own particular feeling is far different, and merits chief attention, because, sooner or later, it is what the artist feels that the public will also feel, and it is right that the creative mind should lead the receptive mind. This being granted, it follows that the artist's idea of a perfect rendering in printing ink should be consulted. When we cannot consult it, it will be needful, on our own responsibility, to render it not with a mean and niggard neatness, nor with a rough, blundering ruggedness. If I might define the ideal photogravure, I would say that the touch should be clearly perceived, but so also should the transparency or opacity of the original be rendered. This is a hard thing, but let it be remembered that the old mezzotint engraver would, in his best work, give two or more distinct tints, one fine, another coarse on top of it, and the result was increased transparency.

When they rock a plate there is one tint all of one size—that is, when they first prepare a plate. When they scrape that, it is converted into a gradation of one degree. They find it does not hold ink enough. They now take a bigger rocker and go over all that work, and the peculiarity of it is—the rocker that they pass over it having a larger arc—that it goes lightly on the hollows, and the hollows are the lights. In the mezzotint method *these* (hollows) are the lights, having the little digs in them; *these* (hills) are the darks, having the deep digs in them. So that, when the rocker goes over it, it opens the hollows a good deal, so that re-rocking does not destroy detail to the extent that one would think; and a very light scraping over all these parts is easily done, and the result is that you have two tints, a bigger tint and a smaller tint. Now, if you go over the road to that institution (British Museum), you can see in the Print Room all sorts of mezzotint engravings, and you will find that the best are those which are twice rocked; some are even three times rocked, and three times scraped out, and sometimes they rock and scrape out portions only. The consequence is that the old plates were extremely rich—I cannot see my way to do that in processing.

Thus I do not like a hard equal tint in photogravure if it is to render the best result. Rather let one granulation cover another, and one procedure be seen through another. I am very particular about this, because now we approach a very big subject—half-tone in relief. Let one texture be seen through another texture. It is a better thing than graduating the texture according to the colour. That is very good, I will allow; but every part of the plate should have more than one texture upon it, and then you get transparency. Then, I find the great difficulty in meeting art requirements lies in the narrowness of the photographic scale as compared with that of the painter. Our modern dry plates certainly, when well handled, give a nice range of tone, but the negative is not the end of the work, and in all the *physical work* which follows I have found the scale much cramped at both ends. I have to make my lights and also my darks to a large extent artificially. We cannot help it. Bichromate, to satisfy an artist, ought to bite into the blacks deeper and deeper as it goes, but it does not—it stops. Where the gradation of light is in a steady ratio, the gradation of printing starts with a fair effort, and then it gradually gets more flat; and where we want the tones to grow and grow they do not grow, the reason being generally that it is full of pigment. It is only when there is no pigment in it that you get a really good scale. I steadily refuse to see in work turned straight off at one operation any good result if from a full-toned subject.

A. Dawson.

(To be concluded.)

RAYMENT'S IMPROVED CAMERA.

In the early part of the year this instrument came under our notice for review, when we had to record several very important improvements which had then been applied to it. Now a still more elaborately perfect instrument is presented to our attention. Throughout the camera and dark slides are bound with aluminium.

A roller-blind shutter is now enclosed within the very thin front or lens board of the camera. The lens projects inwards towards the focussing screen—both the shutter and lens are entirely hidden from view, and neither requires to be altered when the camera is set up for exposures, as the same space and position is occupied by them whether the instrument be opened or closed—thereby saving considerable time over the old mode where the tedious necessity exists for the lens to be first screwed to the front of the camera, and then the shutter to be connected with the lens. The "Optimus" lens flange is now employed, so that, should a number of lenses be carried, one can be instantaneously substituted for another. A further handy arrangement now exists which, when short-focus lenses are used, enables the operator to rack the telescopic portion of the base-board backwards towards the focussing screen. The screen being made to slide towards the front or lens board makes it convenient for lenses of the shortest-known focus to be used.

Coupling these conveniences with those already enumerated in our earlier notice, we have no hesitation in ranking this as one of the most comprehensive and perfect cameras which have yet come under our observation, while the superiority of workmanship and general taste displayed in the get-up of the whole apparatus are probably unsurpassed.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
August 15	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 15	Hastings and St. Leonards	
,, 15	Leeds (Technical)	Mechanics' Institute, Leeds.
,, 15	South London	Hanover Hall, Hanover-park, S.E.
,, 16	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 16	Southport	Shaftesbury-buildings, Eastbank-st.
,, 17	Bury	Temperance Hall, Bury.
,, 17	Manchester Camera Club	Victoria Hotel, Manchester.
,, 17	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 17	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 17	Southsea	
,, 17	West Surrey	St. Mark's Schools, Battersea-rise.
,, 18	Brixton and Clapham	Gresham Hall, Brixton.
,, 18	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 18	Oldham	The Lyceum, Union-st., Oldham.
,, 19	Cardiff	
,, 19	Holborn	
,, 19	Leamington	Trinity Church Room, Morton-st.
,, 19	Maidstone	"The Palace," Maidstone.
,, 19	Richmond	Greyhound Hotel, Richmond.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

August 4.—Mr. G. W. Atkins in the chair.

The following gentlemen were elected members of the Association. Messrs. A. Black, E. A. Leblanc, J. F. Shew, J. Guardia, and W. D. Welford.

It was decided to accept the invitation of the Photographic Society of Great Britain to contribute a collection of lantern slides for display during the evening exhibition.

Mr. R. P. Drage read the report of the Association's delegates (himself and Mr. J. Weir Browne) to the Edinburgh Meeting of the Photographic Convention of the United Kingdom [see p. 518]. A vote of thanks was passed to the delegates for their report.

Portraiture Without a Studio.

Mr. W. E. Debenham gave a brief discourse on this subject, remarking that, though studio portraiture gave the most agreeable effects, on account of the lights and shadows falling in different directions, which brought out the features in relief, photography without a studio could be made to approximate to studio conditions. If the person to be photographed were placed on an open heath, they would have the light in all directions, but get a flat representation, the effect on the whole being weak, the top light predominating. With a house on the heath, and the sitter in front of it, the house would keep a great deal of light from the face, but the top light would be excessive. Matters would be reversed, however, by placing the sitter near the house, the light being cut off by the house behind, while a wall at the side would fulfil studio requirements, and they could thus get portraits scarcely distinguishable from studio work. He had taken successful portraits in this manner in collodion days which would have been almost impracticable to get indoors, and showed several examples. As regards portraits indoors, lighting by reflection made one independent of windows. Rembrandt effects could be obtained by placing the sitter near a window, and lighting the shadow side by reflection, using a large surface. The reflector, however, should not be placed at a great angle.

Mr. A. C[illegible]an had taken portraits out of doors of the Khedive of Egypt, in the manner suggested by Mr. Debenham, and it had been impossible to tell whether they were studio pictures or not.

Mr. Debenham remarked that portraiture out of doors was practised before studio portraiture.

Mr. Beckett said out-of-door portraiture was easier for amateurs than studio work.

Mr. Debenham said the side reflections should not be carried too far back. In regard to the use of magnesium and daylight, he thought the flash would cause a second high light in the eye. He did not think a silvered mirror as good as a sheet, as the latter had a larger surface.

Mr. J. S. Teape had used a small flash on the dark side, and found it a great improvement. He had not found the two lights in the eyes. The daylight overpowered the small flash.

After a vote of thanks to Mr. Debenham, the meeting adjourned.

North Middlesex Photographic Society.—August 8, the President, Mr. J. W. Marchant, in the chair.—Thirty members were present, and four new members were elected. The Secretary was called upon to open a discussion upon the various methods of obtaining harmonious prints from harsh negatives. During the evening Messrs. Pither, Cherry, Cox, Forbes, Gill, and the Chairman spoke on the subject. The method of harmonising harsh negatives by rehalogenisation and redevelopment was chiefly dealt with, and prints from negatives before and after treatment by this method were shown, and a demonstration of the process was given. Prints from negatives taken at the outings to West Drayton and Boxmoor were entered for competition. The vote of merit was accorded to Mr. Wall for West Drayton, and to Mr. Cherry for Boxmoor. A vote of thanks to the chairman concluded the business. The next meeting will be held on August 22nd, when Mr. Wall will take the chair, and Mr. Debenham will address the Society upon "Carbon Transparencies." Visitors welcome.

Hackney Photographic Society.—August 2, Mr. W. P. Dando in the chair.—Members' work was shown by Messrs. Capel, Nunn, & Reynolds. Mr. Dando showed a series of views taken whilst with the Convention. Question asked: Why does the P. O. P. print sometimes purple and sometimes red; and which gives the best toning? Reply; when fresh, it gives the purple tint. With absorption of moisture the paper prints the red tone, which is preferable, as it tones to a richer shade. On Bank Holiday the Society had a whole-day excursion to Dorking and Gomshall.

Harlesden and Willesden Photographic Society.—August 7.—Mr. Clapton gave a lecture upon the subject of lenses. The Secretary, Mr. Woodbury, of 23 Fairlight-avenue, Harlesden, is particularly desirous that the existence of this Society be made known to the numerous amateur photographers residing in this and neighbouring districts, and will be happy to give all information to those likely to join.

South London Photographic Society.—August 4, the President, Mr. F. W. Edwards, in the chair.—The evening was devoted to the explanation and demonstration of various "printing processes." Mr. G. H. Moss described at length the method of preparing and coating of paper by the collodio-chloride printing-out process, and showed specimens of work on paper of his own preparation. The Fry Manufacturing Company exhibited some pictures printed on their Soltype paper. The manipulation of this paper appeared to be very simple, and the tones of the finished prints were much admired by the members present. The Honorary Secretary suggested, as an aid to focussing, the fixing of microscopic cover glasses to the focussing screen with Canada balsam, which enabled a focussing eyepiece to be used with great facility. It was announced that the President offered a prize for the best picture produced on the sample Paget plates, a large number of which were distributed at the meeting; the result to be judged on the 5th September, 1892.

Bath Photographic Society.—July 29, excursion to Castle Combe and district.—The party, including several ladies, left the city by brake, and, proceeding through Box, Corsham, and Pickwick, reached Castle Combe about two o'clock. Here they were received by Dr. Sudlow, who drove with them to Grittleton House, some two miles distant, the seat of Sir Algernon Neeld, Bart. The house is of very beautiful proportions and design, with richly ornamental grounds. Having viewed these outside attractions and photographed them, the doctor, armed with the necessary permission, conducted the Society through the two spacious picture galleries, filled with very valuable paintings and statuary. Returning again to Castle Combe, and after a brief rest, the doctor piloted the Society through Mr. Lowndes's beautiful park, where more photographs of the Manor House and adjacent attractions were obtained. At seven o'clock the party returned to the Dower House, Dr. Sudlow's residence, where tea was awaiting them, and two hours later the departure from this delightful valley was taken. During the return journey a hearty vote of thanks was passed to Dr. and Mrs. Sudlow for the arrangements and their hospitality.

Rotherham Photographic Society.—August 2, Dr. Baldwin (President) in the chair.—Petition against proposed restrictions on photographers at the World's Chicago Columbian Exposition, was agreed to. Hon. Secs. exhibited a series of ordinary silver prints, made twenty-eight years ago by a local worker. Although mounted, and no special pains had been taken with regard to them, they had undergone very little, if any, change. Prints on Eastman's gelatino-chloride paper were also shown, and were very favourably criticised. It was agreed that the third excursion of the season should take place on Saturday, August 13. The place chosen was the Ilsevlin Valley, near Sheffield. Mr. A. T. Cocking, mining surveyor, and one of the staff of the Frith College, Sheffield, then gave an address on photographic chemistry, confining his attention principally to change which salts of silver undergo in printing, and after-processes. His remarks were illustrated by several experiments. On Friday, the 5th inst., the council of the society made arrangements for the annual members' competition. There will be five classes, viz., A, six untouched negatives; B, three untouched negatives and prints therefrom (1892 excursion

work); C, four negatives and prints, open only to those who have not hitherto gained an award; D, six prints; and E, six lantern slides. At an Art and Industrial Exhibition, held in connexion with the Rotherham School of Science and Art, on July 28, 29, 30, and August 1, several of the Society's members sent specimens of work done. Certificates of merit were awarded to Mr. Rackstraw and Mr. Hemmingway.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 13,926.—"Improvements in Photographic Cameras, and in Films for use therein." J. F. PARSONS.—*Dated August* 2, 1892.

No. 13,977.—"Improvements in or relating to Photographic Processes." N. B. KENEALY.—*Dated August* 2, 1892.

No. 14,108.—"An Improvement relating to Photographic Cameras." J. T. GRAY.—*Dated August* 4, 1892.

SPECIFICATION PUBLISHED.

1885.

No. 12,972.—"Holders for Photographic Films." Communicated by Eastman. BOULT.

PATENT COMPLETED.

IMPROVEMENTS IN PHOTOGRAPHIC DARK SLIDES.

No. 3598. WILLIAM MIDDLEMISS, Alice-street, Bradford.—*July* 9, 1892.

MY invention relates more especially to solid slides, and is intended to take the place of the small buttons or other fasteners usually used to keep the sensitive plates in position. At one end of the slide, on one or both sides, I fix a plate of brass or other metal. This plate is pivoted at one end, and the other end is made to move about a quarter of an inch. When it is required to fill the slide with the sensitive plates, this brass plate is moved back, and the plates dropped in; then the brass plate (having a spring behind it) moves forward, and projects slightly over the sensitive plate, and keeps it in its place.

One end of this plate is made to project through the side of the slide, so that it may easily be moved from the outside.

Correspondence.

ORTHOCHROMATIC PHOTOGRAPHY.

To the EDITOR.

SIR,—Returning from travelling, I find Mr. Edwards's letter in your issue of July 15. If Mr. Edwards is still of opinion that he *successfully* opposed my patent, I must leave him to the enjoyment of that view, in face of the *facts* put before him and your readers by Messrs. Allison.

I can duly appreciate counsels' opinion, but, as pointed out before, it rests on "*the evidence adduced*," and, that evidence being biassed beforehand, such "opinion" must necessarily be one-sided.

Let us, on the other hand, bring it against the uncontestable facts of scientific evidence, such as we have in this case—evidence attested by the highest authorities in such matters, and based upon *facts known*, and about which there can be little doubt of its correctness.

Such evidence, both English and Continental, we have, showing that, for instance, eosids of silver *does not form* when eosine is introduced with "ammonia as a vehicle" into the emulsion. Hence we have a right to conclude, with Dr. Acworth and others, that it is Mr. Edwards who uses Dr. Vogel's process, and not Dr. Vogel who infringes on the Tailfer patent.

I have sufficiently dealt with the question of keeping qualities, and if plates by my process do not keep, why should Mr. Edwards go out of his way to use it, as he evidently does. Have his plates never gone wrong? We know for a fact that they have.—I am, yours, &c.,

Berlin, August 3, 1892. DR. H. W. VOGEL.

THE NEW EASTMAN GELATINO-CHLORIDE PAPER.

To the EDITOR.

SIR,—I am a busy photographer, and am seriously inconvenienced by the slowness of the printing paper I have hitherto used. In my despair I turned to Eastman's gelatino-chloride, as it certainly seemed to have some advantages over the best albumenised paper, but I am rather disappointed with it. It certainly prints quickly, but, as far as I have gone, the advantages seem, in my hands, to end there. The prints tone unevenly, while the film is so delicate in manipulation that, if you mount the prints in the usual way, they stick together, and it is impossible to get them apart; as for burnishing after you have mounted them separately (a great waste of time), your work is all undone. Are there no means of easily working this paper, in order to get good and uniform results?—I am, yours, &c., C. D. V.

London, S.W., August 8, 1892.

[In our experience of the new Eastman paper, we have not met with the difficulties detailed by our correspondent; but having placed his communication before a professional photographer who, we are aware, is extensively and successfully working the new paper, we have received the following reply, which may assist "C. D. V." and others.—ED.]

"The great advantage of the chloride paper is, first, its quick printing qualities; second, the brilliant results obtained, the delicacy of tone, and fineness of definition, and, above all, permanency of image. Then there is the saving of time in manipulation; there is no need to wash before toning; the paper, not being soaked, does not take up so much hypo, and therefore the final washing is curtailed; and I have found that washing all night in running water, so long as alum has been used, does not soften the film nor make the paper pulpy.

"With Eastman's gelatino-chloride paper I find that I can get every shade of tone, from a brick red, through chocolate brown, purple, to almost black and white. It all depends on the length of time the prints are allowed to remain in the bath. A brilliant *glacé* or a matt surface can be obtained with the same paper.

"In the first place, the prints are squeegeed on to a ferrotype plate, which has been previously polished with a solution of three drachms of spermaceti wax dissolved in twenty ounces of benzine. This should be rubbed in, and then polished off with a dry duster. For matt surface I treat fine ground glass in the same way, and allow the prints to dry. I do not use talc or powdered French chalk, as it sometimes refuses to act. When mounting the highly glazed surface or the matt surface, I find it is best to use fine Scotch glue of a thin consistency. This, however, to the busy photographer would be a tedious process; but, if the following hints are acted on, there is no reason why any one should go back to albumen paper when chloride has the above advantages.

"*Toning.*—I do not insist that only one bath should be used; but photographers must please to remember that, whatever formula they make up, potash alum MUST be used. The neglect of this will throw all their careful work out, and failures will be the result. It is, however, only fair to say that, if a paper or a plate is to be given a proper and just trial, the formula issued by the makers should be used. Therefore I strongly recommend the following, which I have tried successfully:—

No. 1.

Hyposulphite of soda	20	ounces.
Alum potash	5	,,
Potassium sulphate	2	,,
Sodium sulphate (Glauber salts)	10	,,
Water (distilled)	160	,,

"First dissolve the hypo and alum in the water, then add the potassium sulphate and sodium sulphate. Allow to stand for two or three hours before using.

No. 2.

Gold chloride	15	grains.
Acetate of lead (sugar of lead)	64	,,
Water (distilled)	8	ounces.

"For use: No. 1, 8 ounces; No. 2, 1 ounce. Shake No. 2 well, and add to No. 1.

"*Washing.*—I omit the washing before toning, and find that two hours is sufficient afterwards.

"*Drying and Mounting.*—I proceed as indicated formerly, or lay prints face to back and drain the water out. This is where the non-use of alum will frustrate one's efforts. It is possible, however, to mount the prints damp, and for a mountant I use Field & Tuer's Stickphast. Rub down with a fluffless, chemically pure paper, or a soft sponge. I do not use a highly glazed paper or blotting paper to a gelatino-chloride print. The prints may be allowed to dry naturally, and mounted in the usual way.

"*Burnishing.*—The prints must not be burnished (hot burnisher) until they are thoroughly dry, and should be passed through straight and quickly, and not corner-way nor slowly. It is not necessary to have the burnisher quite so hot as formerly used for albumen. Gelatino-chloride prints do not require lubricating.

"A few general observations may here be made. The prints do not go back much in the toning, so time is saved because they need not be printed so deep as for albumen.

"The combined toning and fixing bath has been attacked, and the chemical question can be left for chemists to fight out. All I know is, that the results are perfect in practice, whatever the theory may be. It is, however, quite competent for your correspondent to be assured that the prints are absolutely fixed after two minutes' immersion in the bath. With Eastman's paper I find that blisters are unknown. It has been a generally expressed opinion that gelatino-chloride paper is the paper of the future, but so many hang back because they fancy it is not so easy to use, and will require a change in the routine of work."

A NEW DEVELOPER.

To the EDITOR.

SIR,—I have been told by a friend lately returned from Germany, that a new reducing agent has been discovered by a foreign chemist, which

will develop plates without the need of an alkaline accelerator being employed. As such a developer would be a boon to amateurs, may I ask you to be kind enough to tell me where it can be obtained, also price, &c., and much oblige?—I am, yours, &c., DEVELOPIST.

August 9, 1892.

[We are unable to give the particulars asked for in the last sentence of our correspondent's letter, but if he will turn to another part of the JOURNAL (p. 517), he will find that his information as to the new developer is correct.—ED.]

THE DECAY OF PROFESSIONAL PHOTOGRAPHY.

To the EDITOR.

SIR,—I read your editorial in last week's JOURNAL on the above with dismay, and surprise that your JOURNAL, running ostensibly in support of photography as a trade journal, should go out of its way to run a tilt at its chief supporters, and slate the profession generally. This is, to say the least of it, "bad form," and is not easily understood. Your remarks about the causes commonly assigned for depression in business being *bad trade, severe competition*, &c., are not wise. These are usually the cause of any depression. Photography being practically a luxury, is bound to suffer more or less in a time of depression, as the necessaries of life make first and often last demands upon the purse when money is tight, therefore photography has to stand aside and wait the advent of a more prosperous season. The remarks about the once-despised but not potent amateur are, to my thinking, far-fetched. In what is the amateur all-potent? In plate spoiling, I should say, and bringing them to the photographer with elaborate suggestions as to how they should be printed. Lads fifteen years of age, clerks in banks, and others having leisure time, and elated with having secured some sort of an image on a plate, immediately begin to instruct the professional, thus proving that "a little knowledge is a dangerous thing." Your remarks about a boy fifteen or sixteen years of age learning the business in a year are most absurd. Then, what have the twenty-five years' workers been doing, especially as they are still learning? They must either be complete duffers, or else your remarks won't hold water.

You say, What is to be learnt in the studio beside lighting, posing, exposure, and development? I reply, Nothing more than these four; but they take learning, and boys of fifteen don't know them, Mr. Editor. Then you go on to say that all, or nearly all, the work is "put out"—printing, retouching, enlarging, and even taking the negative. This is not the case with myself, and I can hardly think the picture true of the profession as a whole. I have had twenty-five years' practice, and been all through the wet-plate process, being in full swing with that before dry plates were brought in commercially at all. I speak disinterestedly on this matter of apprentices, not having an apprentice in the place at all, all my assistants being paid workers at current rates and have been with me some years; still, I think I should be a fit and proper person to teach an apprentice his business, if I had one. Why should a photographer not be a fit person to teach a lad his business? You put them down as a lot of footpads! under-the-weather sort of chaps! seeking whom and what they may devour in the shape of apprentices and premiums, and then, having secured them, not able or willing to teach anything in return! I don't think this is a true estimate of the great body of photographers, and I repudiate this view of them on their behalf. Then you say that, fortunately, the future of photography does not depend on the professional. Who does it depend on, then, may I ask? They are the practical exponents of the art, and the most interested people in it. Does it depend on cheesemongers, or the all-potent amateur? Speaking for myself, I know I have laboured conscientiously and vigorously to master photography in its various branches, and, when I have done with it, shall leave it better than I found it. If all of us work, not to get a living, but out of a sheer love for the art science we have taken up, I say that is just what the future of photography *does* depend on—the art, education, ability, and enthusiastic endeavour of its professors and workers.—I am, yours, &c.,

August 8, 1892. A PROFESSIONAL PHOTOGRAPHER.

[We congratulate our correspondent upon his non-mercenary devotion to photography, a sentiment which, were it more general, would have obviated the publication of the article that has so unaccountably stirred "A Professional Photographer's" ire. The object of that article was, as, indeed, our object always is, to point out opportunities for our professional friends to promote their own advancement. Were they invariably so well up in their art as "A Professional Photographer" claims to be, and just as competent to teach it to apprentices and students as he also wishes us to infer he is, we should, in recent times, not have had such innumerable pleas for the establishment of technical institutes, and it would not have been our unpleasant duty to draw attention to the frequent disqualifications of photographers as teachers and instructors. Of course, there are many exceptions to this rule; while there is one important qualification for business success in which we are happy to find photographers (with the exception of "A Professional Photographer") seldom deficient, and that is the useful art of politeness.—ED.]

EIKONOGEN FOR BROMIDE PAPER.

To the EDITOR.

SIR,—In using eikonogen for bromide paper, I find that I can seldom get the shadows other than of a blackish-brown colour, which gives an appearance of rustiness to the print. The formula I use is as follows:—

Eikonogen	4 grains	to each ounce of water.
Soda sulphite	20 ,,	
Potassium bromide	1 grain	
Soda carbonate	10 grains	

I notice that at a meeting of the Photographic Society, Mr. Clifton spoke very highly of an eikonogen formula by Mr. Cowan, with lithium carbonate. Would either of those gentlemen kindly give your readers the benefit of the formula, and say what advantage the lithium has over the other carbonates?—I am, yours, &c., G. G. DRUCE.

West Kensington, August 5, 1892.

LOSS OF DENSITY IN FIXING.

To the EDITOR.

SIR,—Mr. Benham and Mr. Albert Levy disagree with you in your proposition that a negative appears rather denser when wet than when dry. I was always under the impression that such was really the case, so that your correspondents' denial took me by surprise. Upon putting the matter to the test, in the only practicable way, that is by comparing the portion of a negative still wet with one that had dried, my impression and your statement were decidedly and unmistakably confirmed.

Perhaps my eyes are different in power to those of Mr. Benham and Mr. Levy; but, singular to relate, my wife and several friends (among them two amateur photographers) agreed with me on inspection that the wet parts of the negative were denser than the dry. Will Messrs. Benham and Levy oblige me by casting theory to the winds, and putting my experiment to the proof?—I am, yours, &c., A. C. MANNERS.

London, August 8, 1892.

"CUTTING THE SHADOWS."

To the EDITOR.

SIR,—My attention has been called to a paragraph in your report of the proceedings of the London and Provincial Association dealing with the question, "What is the meaning of 'cutting the shadows' in a plate?" The paragraph I particularly refer to is as follows:—"It appeared that the question referred to an editorial notice of the 'Barnet' plates by a contemporary, in the course of which pyro *soda* was said to 'cut the shadows.'"

Now, Sir, what your contemporary stated was, that I had said that pyro and ammonia cut the shadows (your report says pyro and soda); but, unfortunately, neither of you are correct. What I actually said was, that any good formula worked well with the "Barnet" plates, but I did not like sodium sulphite in combination with pyro and ammonia, as it tended to cut out the shadows (*i.e.*, leave them too bare). The "it" referred to was sulphite of soda (which your contemporary omitted), as in my experience a good, clean emulsion, such as the Barnet plate, does not require the assistance of sulphite of soda to clear the shadows (although it may be necessary with some makes of plates), and such a developer tends, with these plates, to leave the shadows too bare, or, in other words, cuts out the delicate detail in the shadows. Apologising for trespassing on your space,—I am, yours, &c., BIRT ACRES.

Clovelly Cottage, Barnet, N., August 9, 1892.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Wanted good cabinet portrait lens in exchange for whole-plate portrait lens.—Address, A. WILKINSON, Photographer, Bradford Road, Dewsbury.

Wanted three-inch compound slide rest for Lancaster's fifty shilling quarter-plate camera and leather case.—Address, "MERBLE," 61, Newman-street, W.

Exchange capital tricycle for battery of quarter-plate lenses, half-plate kit, or Aptus universal camera.—Address, W. P. WIENMAN, Painswick, Gloucestershire.

Will exchange Marion's *Retouching Book* (2s.) and *Ilford Manual* for the *Indispensable Handbook of the Optical Lantern*.—Address, LEMMANN, Photographer, Mold.

12×10 single lens, by Ross, eighteen-inch focus; exchange for four-inch portable symmetrical or Dallmeyer's four-inch wide-angle rectilinear.—Address, T. HADDOCK, 27, Chapel-street, Leigh, Lancashire.

Will exchange THE BRITISH JOURNAL OF PHOTOGRAPHY 1886 to 1891. Missing numbers are three numbers in January, one in April, three in May for 1886, month of February in 1887, two numbers in December, 1891. Exchange for materials for carbon process.—Address, W. C. BAX, Morden-street, Rochester, Kent.

Exchange 9½×9½ square bellows studio camera, four single slides and carriers, also half-plate Lancaster's Instantograph, three Tylar's metal double slides, and Lancaster's wide-angle landscape lens, for good whole-plate modern camera and three or four double backs.—Address, J. T. PICKLES, Lloyd Works, Hebden Bridge.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges" must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

Egmont Augustus Usherwood, Norwich.—*Photograph of Frederick Williams, late railway guard.*

William Harrison, Leeds.—*Photographs of the Hunslet Football Club, and of the following members: A. Goldthorpe; W. Golthorpe, J. Rathmell, and A. Goldthorpe, in a group.*

DR. L. GIOPPI (Milan).—The book has not reached us.

A. J.—Spot the printa in just the aame way as you would if they were on albumenised paper.

A. JAMES.—Probably your celluloid films "buckled" in the carriers, hence the inequality of the definition.

R. NICHOLS.—If the photographs are copyrighted, you can proceed for the recovery of penalties for the infringement.

E. MARTIN.—We should recommend you to apply to a picture dealer. The photograph is, we should say, an excellent one.

E. LIESEGANG (Düsseldorf).—Xylonite suitable for the purpose may be obtained of the British Xylonite Company, Homerton, London, E.

E. B.—Possibly the granularity would not appear with pyro soda. We have never experienced the trouble complained of with the plates you name.

H. WILKINS.—If lightness is such a great *desideratum*, why not have the stand made of bamboo? It is very rigid, and much lighter than either oak or ash.

W. A.—Quite right. Hydrofluoric acid cannot be kept in glass or porcelain vessels. For its storage, bottles of lead or gutta percha have to be employed.

D. J. W.—Pine will do quite well for an enlarging camera, but it will not prove so durable as one made of mahogany, particularly if it be subjected to rough usage.

A. NICHOLS.—Brilliant prints twenty years old, and still showing no signs of fading, are by no means "great curiosities." There are many nearly double that age which show little or no change.

GEL.-CHLOR.—You may be able to derive some assistance in your difficulties with the new gelatino-chloride paper by perusing the letters on the subject which appear in our correspondence columns this week.

M. D. (Birmingham).—If the dealer puts his name on an apparatus of foreign make, without an intimation that it was made abroad, so as to represent it being of his own manufacture, he certainly infringes the Trade Marks Act.

S. DAWSON.—About the best material for rendering paper photographs transparent, for colouring from the back, is paraffin. It is not so liable to discolour as varnish or resins. Beeswax is also good, but not so good as the paraffin.

C. W.—Orthochromatic plates ought to be better for photographing flowers than others not so treated. The greater part of the flower studies of Mr. H. Stevens were taken on ordinary plates. All Mr. and Mrs. Payne's were by the wet-collodion process.

T. ELLIOT.—1. What is known as "four-pound" lead will be quite thick enough to line a small water-cistern with. 2. Xylonite dishes should not be used for spirit, as that is a solvent of the material. 3. Probably only a rumour that has no foundation in fact.

BOWMAN says: "Will you give me a hint as to the use of mercuric chloride to obtain warm tones on bromide paper, or refer me to any source of information on the subject?"—See an article by Mr. Thomas Bedding on page 549 of the volume of the JOURNAL for last year.

SILENDO.—The picture was produced by an adaptation of the carbon process called chromotype, full particulars of which you will find in Hardwich & Taylor's *Photographic Chemistry*. The process is practically obsolete, although at one time it was extensively worked.

LEEDS.—The rain water caught from house pipes in large towns is usually far more impure than the ordinary tap supply. It certainly should not be used for any purpose for which distilled water is necessary. We believe you may attribute much of the trouble to the water employed in compounding the solutions.

ARC says he has a single landscape lens of twenty-five inches focus, and four and a half inches in diameter. The smallest stop is about three-quarters of an inch. He asks what size picture this ought to take.—With that size stop the lens, if a good one, should cover well an 18×15 plate, or, perhaps, one a little larger.

W. MAYS.—The converging perpendiculars are not due to any fault of the lens, but are caused by the camera being tilted and the swing back not being brought into use, or not sufficiently so. That form of lens will give perfectly straight lines when used in its entirety, but not, of course, when its components are employed as single lenses.

A.—If a photographer, or any one else, uses the Royal Arms, and styles himself "By appointment to Her Majesty," unless he holds the royal warrant, he renders himself liable to a heavy penalty. The mere fact that he has taken the Queen's portrait, when attending a ceremony with a number of other persons, does not entitle him to use the terms quoted.

A. MCANDREW asks if indiarubber paper is now used for double transfer carbon printing, as on making inquiry he is told that its use has been discontinued for many years. That is ao in thia country, but we believe it is still used at some places on the Continent. In England the method with rubbered paper has been quite superseded by the "flexible support."

LITHO.—It may be relied upon that the want of density in the negative is not due to the collodion. The brand mentioned is one of the best for the purpose. In all probability the bath is not in good condition, or the development is not carried far enough in the first instance. If there is not a good body of ailver in the image to begin with, it will be impossible to get an intense negative.

W. GOSS aska, if a ailver print be fully coloured in water colour, and the ailver image after a time fadea, the picture will be deteriorated—that is, will the fading show through the colour?—Yes, the fading will show; indeed, the picture would be spoilt. The fading will even show through oil colour. If the pictures are to be expensively finished, they ought to be printed either in carbon or platinum.

Q. E. M. S.—If the apparatus has been kept long enough in the damp to cause the glue to exude from the joints of the camera and dark slides, it will, we fear, be a job for a camera-maker. The best treatment we can suggest is to put the apparatua into a dry room, fully exposed to the atmosphere, so that it may dry slowly. In no case should it be subjected to heat, which would certainly cause the wood to warp.

R. COOKSON.—Yours is not an exceptional experience. When shellac is dissolved in spirit, it does not form a clear solution, but a muddy one, as described. If, however, the solution be allowed to stand undisturbed for a week or two, the thick portion will subside, when the clear may be decanted. Keeping it in a warm place will materially hasten the subsidence. It may be still further hastened by heating the solution.

E. R. C. asks how those elaborate gilt picture-frames which are frequently sold for gold ones are made. We believe they are moulded in the same manner as the gold ones, but, instead of being gilded with gold-leaf, Dutch metal is employed. They are then varnished with a colourless varnish. The cheaper kind of German bead is first coated with silver-leaf, and then lacquered. Both these frames discolour rapidly when the varnish perishes. Some, however, wear well for some few years.

R. FORTUNE asks: "1. What is the sensitometer speed of the 'Excelsior' and 'Nameless' plates? 2. Where can I obtain half and whole-plates to work from the one-hundredth of a second up to the two-hundredth with the 'Newman' shutter? if possible, give aensitometer number and price. 3. What is the price of oxgall, which is mixed with alcohol and used for enamelling? I do not see it in any of the catalogues I have at hand. 4. In the YEAR-BOOK there is a formula for delicate transparencies—pyro, citric acid, and water. Is this for chloride or bromide, and have you to add any other chemicals?"—1. The plates are unknown to us. 2. Most, if not all, rapid plates would work at those apeeds under favourable circumstances. 3. Any artists' colourman's catalogue contains the information. 4. Pyro, citric acid, and water will require the addition of an alkali for either chloride or bromide plates.

PHOTOGRAPHIC CLUB.—August 17, *Photographing Interiors.* 24. *Kallitype.* Saturday Outing, August 13, Waterlow Park. Meet at principal entrance at half-past two.

THE success which attended the lectures in connexion with the last Photographic Exhibition has decided the council of the Fine Arts Institute, Glasgow (where the exhibition was held) to give nightly, during September and the first week of October, a series of lectures illustrated by lime-light views. Arrangements have already been entered into with several popular lecturers, including Professor Young, Messrs. A. Rennie, G. G. Napier, G. Thompson, F. Clibborn, G. Patin, G. Mason, T. N. Armstrong, Rev. Thomas Somerville and others, and, probably, Mr. A. Pringle. Mr. Armstrong is assisting the Secretary of the Institute in arranging the scheme.

THE CONVENTION GROUP.

With this week's JOURNAL *we give a collotype reproduction, by Messrs. Thevoz & Co., of Geneva, of the group of members of the Photographic Convention of the United Kingdom, assembled at Edinburgh, July* 11–16 *last. The negative was taken by Mr. Alexander Ayton, jun., of Edinburgh, and, as our readers may judge by the reduced print, is a very fine one.*

Owing to the difficulty of identifying the large number of persons in the group, and in order to make it as complete as possible, we are obliged to defer the presentation of the Key until next week.

CONTENTS,

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1685. Vol. XXXIX.—AUGUST 19, 1892.

PURCHASING OIL-FREE METHYLATED SPIRIT.

We are now, by the kindness of a provincial correspondent, able to put our readers in possession of the routine to be observed in obtaining the old kind of methylated spirit, that is to say, without admixture with petroleum oil, in which way alone is it now purchasable in small quantities. It may be well to recapitulate the ordinary conditions of storage and sale. To obtain spirit of wine duty free, the Board of Inland Revenue permitted its sale when its potable condition was destroyed by the admixture of ten per cent. of impure wood naphtha. Retailers could sell it without a licence if they added shellac or other resin to it in a certain proportion, the resulting mixture being known as "finish." Last year, owing, it is stated, to these conditions being insufficient to prevent its being used as a beverage, it was further decreed that a further addition of mineral naphtha must be made to the spirit before selling it.

For varnishes any of these forms of spirit are not unsuitable, but "finish" is inapplicable when any purpose involving the addition of water is intended. While for all other ordinary requirements it has been considered that the mineral oil would render the spirit quite useless, as a matter of fact we have received few complaints as to ill effects occurring in actual practice; but, at the same time, there is no doubt that a strong desire to be able to procure the old-fashioned sort exists among photographers generally.

Our correspondent's first step was to send a messenger to the local Inland Revenue Office to obtain the necessary documents. The message was sent that it would be better to make a written application to that office. The letter was written, and a week or so afterwards the head of the office personally called upon the writer of the letter, and, in a most courteous manner, required a considerable amount of information: How much every year was likely to be wanted? what purposes it would be put to? where it would be kept? was there any communication with any establishment for the sale of spirits? was there a still on the premises? and a variety of other queries were put and answered. For a while no further action was taken, but a little over a month from the date of the first letter an official communication from Somerset House was received. It conveyed the Board's authority for our correspondent to "receive annually twenty gallons of ordinary methylated spirit for use in photographic purposes."

This letter was followed by another a few days afterwards from the local office, conveying the same information. Shortly after its receipt another urbane official made a personal call, and brought for signature a printed form called an entry paper, a document to give the authorities power to enter the premises whenever desired to inspect the spirit and the place in which it was stored. There had to be described the place of residence, the "rooms, places, vessels, or utensils intended to be used, the marks or numbers by which they are distinguished, and the purposes for which they are to be used." There was then handed to the would-be purchaser a book of blank forms for Requisitions for Methylated Spirit, and this book "must be produced when required for the inspection of any officer of Inland Revenue." It was further expressly pointed out that, "before a requisition is separated from its counterfoil, both must be properly filled up. Should a form be accidentally spoiled, it must not be separated, but preserved for the officer's inspection."

After the first issuing of the decree about the new spirit, it was necessary for the would-be purchaser of the old kind to find a security to be bound in a penalty for the due performance of the conditions by the purchaser, but this is now unnecessary. It will thus be seen that, though there is a certain necessary amount of red-tapism to be got through before the old kind of spirit can be purchased, it is after all very simple, and where five gallons of spirit can be taken at once there can be no doubt that the old form of spirit will be far preferable to the new. It can be used for all purposes that the latter is available for, and for many that it is not.

We must, however, in conclusion, give a few needful warnings. The purchaser, under such permissions as we have described, must not on any account, if any business friend requires any, sell any portion of his spirit. He must be careful not to have a still without permission, and on no account to try experiments in purifying the spirit; he must only store it in the prescribed room or rooms; and, above all, he must take care of all the papers in connexion with its purchase and receipt.

EXHIBITIONS—OLD AND NEW.

The tongue of rumour is busy with an alleged scheme for the promotion of a photographic exhibition to be held in London next spring or summer, and designed, it is hinted, to open an avenue for the peculiar aspirations of those who fail to find sufficient scope for them at the "old-fashioned" exhibition of the Photographic Society of Great Britain. If rumour speaks truly, and we have every reason in this case to believe that she does, we shall hail the projected venture with great pleasure, for the simple reason that, while photography itself will not improbably derive some appreciable if indirect gain therefrom, the exhibition which it will be set to rival is not in the least likely to sustain the smallest damage, but, on the other hand, stands, to our thinking, every chance of surviving

the rivalry, and of emerging from the friendly competition with a public esteem and reputation highly enhanced and confirmed.

We shall not seek on this occasion to look below the surface for the primary reasons which are said to be at the foundation of the new venture, since they are of far too personal and particular a nature to admit of discussion in these columns, but we shall risk the assumption that the guiding spirits of the affair are a number of esteemed and undoubtedly clever photographers, who differ from the vast majority of their fellow-artists in the focal treatment of their pictorial studies. We are aware that among a limited section of the outside critical public that treatment receives higher commendation than the old-fashioned and conventional but thoroughly logical superiority of definition, upon which, on the whole, photography has thus far contrived to sustain a creditable existence; but as we have before pointed out, it is difficult to estimate what degree of favour the "out-of-focus" school of photography will attract from the intelligent general public, who have hitherto derived their impressions and knowledge of the progressive capabilities of photography from, among others, the annual exhibitions of the Photographic Society of Great Britain. Considered from this point of view, the projected rival exhibition will be a most interesting experiment, the result of which will be highly instructive. If, however, the assumption upon which we are basing these remarks is incorrect, the *raison-d'être* of the scheme is difficult to discover.

In the art world, revolt against what is contemptuously but unreflectively styled conventionality is constantly breaking out. The Grosvenor Gallery was, if we remember aright, a species of protest against the policy of the Royal Academy, which displeased the rump of the pre-Raphaelite brotherhood and some of its impressionistic imitators and hangers-on. But the Grosvenor Gallery has had to close its doors, while the "conventional" establishment in Piccadilly still lives, a prosperous institution. We shall resist the temptation to draw any analogy, merely relying upon its obviousness to point a moral for those to whom it is of more immediate concern than ourselves.

We should be among the first to rejoice if the new exhibition, should it ever take practical shape, were an artistic, and—shall we add?—financial, success. Most photographic exhibitions suffer, we think, more or less from the facility with which they create a sensation of monotony in the minds of many who are not interested except as ordinary visitors. Be the walls never so well covered with clever photographs, among which are representative examples of the great variety of modern printing processes, we ask why in most cases little, or no attempt is made to widen the scope of the exhibition? Surely, for instance, touched and untouched negatives of the prints on the walls would be instructive to many. Again, why are opal pictures, enamels, pictures on silk and other fabrics, and examples of the numerous decorative uses to which photography may be placed, so frequently absent from exhibitions? How few, as a rule, are the examples of photo-mechanical work, and how is it that to-day, when photography is employed by science to a hundred times the extent of a dozen years ago, the examples of scientific photography generally shown are not more numerous now than then?

It appears to us that any new exhibition which proposes to depend for success merely upon a display of "wall" pictures, does not stand the rosiest chance of securing a remunerative share of public favour. Indeed, we may be permitted to complain that several of the old exhibitions are too prone to restrict their attractions to so few classes of work. We do not suppose that any such suggestions as these will be entertained by the promoters of the new exhibition, as their adoption would, of course, frighten away the critical gentlemen upon whose good opinions such high store is placed; but they are, we think, worthy of the attention of the managers of those exhibitions in London and elsewhere which have, up to the present, not unsatisfactorily filled the office of showing the world what photography is and can do. In fine, not enough encouragement is given by exhibition committees to many branches of photography which are capable of supplying most attractive and instructive exhibits.

THE FERROUS OXALATE DEVELOPER.

II.

The green double salt, mentioned in our previous article, forms an important item in the process of recovery of the more valuable constituents of the spent developer. Starting with a solution made on the principle of Messrs. Carey Lea and Willis, we need only refer to the equation given in last week's number to show that the result of the complete oxidation of the developer, whether by use or by age, is the production of this salt together with the precipitation of a portion of the iron in the form of oxide; and that practically the whole of the constituents that are worth the trouble may be recovered by carefully collecting and suitably treating the crystalline residue after freeing it from the adherent ferric hydrate.

In the case, then, of a spent developer, or one that is so far exhausted as to be practically useless except as a restrainer—a purpose which it serves very well—the first thing to be done is to collect the green crystals of potassio-ferric oxalate already formed, and then to expose freely the remaining solution to the atmosphere in order to ensure its complete oxidation, the second crop of crystals being then collected and added to the others. For this purpose the solution should be poured out into a glass or porcelain dish, and left in a warm, dark place, under a light covering of paper or similar material, to protect it from dust without interfering with the free circulation of the air about its surface. It is probable that the end might be gained in a more rapid manner by the use of oxidising agents, but we consider it in every way preferable to avoid the introduction of foreign substances which would prove difficult to eliminate afterwards.

Before proceeding farther we may say a few words on the composition and properties of the crystals. If the equation given last week be analysed, it will be noticed that the ferrous and ferric double salts differ only in the proportion of iron contained in them, the latter consequently, if the elements be rearranged, being found to contain an atom of free oxalate acid, while the proportion of oxalate of potash to ferrous oxalate is fifty per cent. greater. In order to reconvert the solution of the crystals into an active developer, it is therefore necessary to add an atom of iron, which, being first converted by the free acid into oxalate of iron, is then taken into solution by the excess of potassic oxalate.

The simplest plan of restoration would therefore seem to be that just recommended by the I. W. Swan, of boiling the spent solution, or the solution of the green crystals, with metallic iron, though in practice some uncertainty of result arises, possibly from the great tendency to oxidation of the hot solution. Still, the process is a practical one, and we may

therefore describe it. Let the crystals be separated from the precipitated ferric hydrate, and if necessary washed in a small quantity of cold water. They may then be further purified by recrystallisation from the smallest possible quantity of boiling water, the great difference between their solubility in cold and hot water respectively rendering this an easy matter. The washing water and mother liquors are to be added to the original solution, which still contains more or less potassic oxalate, the only ingredient worth saving.

The purified crystals are then dissolved in a volume of hot water, equal to about three-fourths of the original solution, in a glass-boiling flask into which a coil of bright iron wire has been introduced, and a gentle heat kept up. Gradually the almost colourless solution assumes a ruddy tint from the formation of the potassio-ferrous oxalate, and eventually, if the quantity of water used is not too great, it will acquire the deep ruby colour of the freshly mixed developer. If an excessive quantity of water be employed, the colour will be lighter, and it will be necessary to reinforce it with additions of potassium and ferrous oxalates. If, on the other hand, too little water be used, a portion of the compound iron salt will be thrown down and probably decomposed; but if this should occur—as the decomposition only consists in the precipitation of ferric hydrate and re-formation of the potassio-ferric oxalate—a continuation of the process with a larger volume of water will set matters right. There is almost invariably a certain amount of muddiness in the solution produced by the slight oxidation of the ferrous salt under the influence of heat; indeed, this occurs even in forming a new developer, and disappears if the oxide is allowed to subside. The conversion may be allowed to take place in the cold, but the process is then a very slow one.

The operation of reduction should be conducted by gaslight or in a subdued diffused daylight, owing to the fact that the solution is sensitive to light, and complications might be introduced if a strong light were allowed to act upon it. This brings us to a second method of restoration, which for various reasons we prefer to the one just described.

The solution of potassio-ferric oxalate, like that of plain ferric oxalate and other organic ferric salts, is, as we have said, sensitive to light, suffering reduction to the ferrous state with liberation of oxalic acid, which splits up into carbonic anhydride and escapes, while ferrous oxalate is precipitated. The reaction is shown in the following equation:—

$$\underset{\text{2 atoms.}}{2\,K_3Fe(C_2O_4)^3} = \underset{\text{2 atoms.}}{2\,FeC_2O_4} + \underset{\text{3 atoms.}}{3\,K_2C_2O_4} + \underset{\text{2 atoms.}}{2\,CO_2}.$$

Potassio-ferric oxalate = Ferrous oxalate + Potassic oxalate + Carbonic anhydride.

This is the result if the solution at normal temperature be exposed to a strong light, and the fact has been utilised in the attempt to construct actinometers which should measure the value of the light by the quantity of carbonic acid gas given off. None of them, however, have proved practically useful, as the evolution of the gas continues for some time after the action of the light has ceased. Ferric and uranic oxalates are the salts that have been chiefly employed, and their ready solubility in water enables them to form very sensitive solution. The solution of potassio-ferric oxalate in cold water is, however, so comparatively dilute that the process of reduction is very slow, and the potassic oxalate formed is too weak to exert any solvent action on the ferrous oxalate formed, which is consequently precipitated, leaving the solution clear and colourless.

But, if a hot concentrated solution of the green crystals be exposed to sunlight or strong diffused light, the action is very rapid, and the original yellow tint of the liquid gradually deepens until it reaches a pure ruby. In this case, as in the last, the proportion of water employed should be regulated according to the quantity of the original solution, otherwise a portion of the iron will be precipitated in a partially oxidised state.

When the solution has become perfectly colourless, and no further precipitate of yellow ferrous oxalate occurs in the case of the cold solution, or when the colour ceases to deepen in the case of the hot, the action is complete. The cold treatment is of no practical value, as the volume of liquid is too great for any useful purpose, and, as already stated, the small proportion of ferrous oxalate is thrown down instead of being taken into solution. In the other case, an active developer is formed, though it is not at its full strength, since it contains an excess of potassic oxalate, or, more correctly speaking, there is a deficiency of ferrous oxalate. Before allowing the solution to cool, therefore, some ferrous oxalate should be added, and time allowed for the free potassic oxalate to become saturated; or, if preferred, a solution of ferrous sulphate may be cautiously added, until a precipitate just begins to form, though this will produce a less energetic solution than the other.

Thus far the economically inclined photographer will find all tolerably plain sailing, the manipulations easy, and the result perhaps worth the trouble if the system of saving the solutions be carefully followed out; but, if he is desirous of proceeding any farther to recover the potassium salts from the muddy solution whence came the crystals, his troubles will begin, and he must be prepared to perform a series of operations requiring a great deal of care and skill in chemical manipulation, for which he will secure but a poor return. We may just sketch the course to be followed, though we doubt whether it can be made remunerative, even on the most extensive scale.

The first operation in this case must be to filter the liquid clear of the sediment which, in the case of an unused developer, will consist almost, if not wholly, of ferric oxide or hydrate. In the case of a developer that has been in use, there will be present in the sediment also a certain amount of ferric oxybromide, dependent upon the amount of use to which it has been subjected and the length of time kept. The sediment, however composed, may be at once thrown away as valueless.

The remaining solution, which will vary in colour from a dirty brownish red to a decided yellow, according to circumstances, will now contain chiefly potassio-ferric oxalate, with, perhaps, a little unoxidised ferrous salt, together with, in the case of a used solution, some ferrous or ferric bromide. Both the latter salts are most probably formed by the hydrobromic acid derived from the sensitive films, the first being gradually oxidised and converted into oxybromide, while, in the form of ferrous bromide, it communicates a yellow tinge to the solution, the ferric salt contributing a brown colour. In the case of a developer made by mixing solutions of ferrous sulphate and potassic oxalate, there will also be present the ferrous sulphate produced by double decomposition.

The next operation is the elimination of the remainder of the iron which is totally useless. This is effected by the cautious addition of solution of potassium hydrate, by means of which the iron is thrown down in the form of ferric hydrate, potassium oxalate being left in solution. At the same time, any bromide of iron present is converted into potassium bromide with separation of ferrous hydrate, and the solution becomes colourless or nearly so.

Next we have to deal with the soluble bromide present, which, if allowed to remain, would play the part of restrainer whether wanted or not. This can be eliminated by shaking up the solution with excess of silver oxalate when the bromine goes to the silver to form silver bromide, and oxalate of potash is again formed. As oxalate of silver is very slightly soluble in cold water, a minute trace may remain in solution, but this will be instantly reduced on the addition of the ferrous salt in the process of preparing the developer.

Lastly, we have to eliminate the sulphuric acid present in the form of sulphate of potash, which, though but a mild restrainer, cannot be allowed to accumulate indefinitely, as would be the case after repeated rejuvenations of the solution. This is got rid of by means of barium oxalate, employed in the same manner as the silver oxalate, barium sulphate and potassic oxalate being formed by double decomposition.

If these various operations have been well and carefully performed, we shall now have a solution containing only potassium oxalate and accidental impurities from which the salt may be separated by crystallisation, when, if the result satisfy the operator, it will be satisfactory, though, as already said, we do not expect it.

On a large scale and systematically worked, the first part of the process—the reduction of the green crystals—may, no doubt, be profitably carried out; but, so far as we can see, except as an interesting experiment, the latter operations are useless and pecuniarily unprofitable.

The Price of Silver.—A few weeks back reference was made to the extraordinary low price of metallic silver. Since then its value has further declined, again "beating the record." It was quoted on Friday last at 37⅞*d.* per ounce. Some years ago the metal was worth over 60*d.* per ounce, and at that time eighty and ninety-grain baths were in vogue for sensitising paper upon. From this it will be seen the production of photographs was more costly then than now. But, then, *cartes-de-visite* were not done at half-a-crown a dozen.

Science and Art Report.—In the annual report just issued, on the subject of chemistry, the examiners complain that only comparatively few candidates possess any real knowledge of chemical principles, or show accurate observation of facts. The conclusion arrived at by the examiners is that the students are left very much to themselves by the teachers, and therefore have to work at their text-books without assistance, and in many instances without properly understanding them. Reform is certainly needed, if this be the case, in teaching practical chemistry, and the department should see to it, as it is liberally supplied with funds. In some instances we fear that the teachers have only a superficial knowledge of the subject themselves. If this be so, how can it be expected that they can impart sound tuition to others? Many of the certificates now obtained are the result of cramming and coaching, rather than that of well-grounded knowledge.

Manufacturers' Reputation.—In advertisements, when anything is to be disposed of, the name of the maker is generally quoted as a guarantee of its quality—that is, if the maker happens to be one of renown. This is done quite regardless as to the treatment it may have endured since it left his hands. Every one knows that cameras, and suchlike apparatus, suffer deterioration by use; but all may not be aware that lenses may do the same. A lens, by a first-class optician, may, after a few years' use in some hands, be no better as a photographic tool than one by a second or third-rate maker. Therefore too much reliance must not be placed on makers' names. Indeed, with some second-hand apparatus, their reputation may suffer. The most amusing instance of trading on a manufacturer's reputation that has come under our notice was when, in reply to an offer in our "Exchange Column," a number of lantern slides were offered, and, as a guarantee of their excellence, it was stated that they were all made on Blank's plates.

Foreign Reproductions.—Reference has more than once recently been made to the fact that a very large proportion of the photogravure reproductions of English pictures are made on the Continent, and asking the reason why. It is rumoured that, at the closing of the Royal Academy Exhibition, several of the best works were dispatched abroad to be reproduced by photogravure or other processes. Should the rumour prove correct, it would certainly seem to be a reproach on British photographic engravers. One thing seems pretty certain, which is that the photographic reproduction of works of art is made more a speciality of abroad than it is here. One seldom sees in the shop windows photographs, silver prints of the scrap type, of English paintings, though they are full of copies of foreign ones. Although these copies are sold at a very low rate, every one who examines them critically must be forcibly impressed with their technical excellence, and the way in which the different colours of the original are translated into monochrome. Indeed, it is almost difficult to conceive that many of them are copies of paintings. Of course, the more perfect the negative the better will be the photogravure made from it.

Collotype Views.—For some years past it has been a matter of surprise to many, ourselves amongst the number, that the collotype process has not been more extensively employed than it has in the production of views of seaside places and other holiday resorts. We are fully aware that the process has been utilised for this kind of work, but usually under its most unfavourable aspects—that is, as regards quality. A high-class collotype is in every way equal, if indeed it is not superior, to the finest silver print. At the same time, it has the undoubted advantage of permanence—no mean advantage to those publishers who supply the trade "on sale or return." Collotypes, such as will compare with the best silver prints, cannot be produced at a low rate, but they need not cost more than the silver. The usual run of collotype for this class of subject is generally of a very low type, and the process is not shown to its best advantage. There are to be seen at the present time, in the shop windows, views of London mounted in optical contact with glass with bevelled edges—"opalines," as they are termed—made by this method. Now, if there is a way by which a collotype can be shown to a disadvantage, it is when it is treated in this fashion. If the print be of a mediocre character, by this treatment its vigour is reduced, while its granularity is apparently exaggerated. These remarks suggested themselves when looking at some of the London views alluded to, bearing the initials of a well-known publishing firm, which we can only assume are piracies of their work, as we feel assured they would not issue pictures of such quality.

Practice v. Theory.—Much has been said of late in the pages of this and other photographic journals on the subject of technical education. Now, there is no question that the man who has a good theoretical knowledge of the work he is engaged upon possesses, or ought to do, material advantages over the one who only works, so to speak, by rule of thumb. It has been said, with regard to apprentices, that there are very few masters who are themselves competent to teach the business for which they have received a premium. That this is the fact with some who take apprentices, or, to use the modern term, "articled pupils," cannot be denied for a moment—that is, if we take photography even in only a few of its many phases. On some parts of the Continent there are schools where the photographer may acquire a theoretical knowledge of his art. But do those who avail themselves of them turn out better workmen than those who do not? They should do, though some Continental employers say that they do not, until they have unlearnt a great deal of what they have been taught. The principal of a large photo-mechanical establishment on the Con-

tinent remarked to us, some little time ago, anent this subject, Where is the teacher in any of the technical schools who can himself produce collotypes, or engraved plates, or even negatives, equal to the experienced operators to be found in every establishment? adding that the majority of these know comparatively very little of theory, though they are sure of their work in practice. Still, as we have said before, a theoretical knowledge should be of value when combined with practical experience. But, if the teachers themselves cannot produce the best of work in practice, how, it may be asked, can they instruct others to do so?

CELLULOID FILMS.

Your answer to a correspondent as to the "buckling" of cut celluloid films, and the consequent loss of definition of the image, would, I should say, serve as a reply to a question which I myself might put before you with reference to the mysterious manner in which, despite the most careful focussing, some parts of my negatives on cut films often unaccountably approximate to an unwelcome furziness, while, on the contrary, other negatives exposed under similar circumstances, and during the same day or outing, are all that can be desired as regards general definition. Two years ago, when, on taking up cut celluloid films in place of glass plates, I met with this trouble, I was inclined to ascribe it to an optical cause; but the simple experiment of equalising the conditions of working as regards aperture and focus showed me that my conclusion was wrong.

This difficulty of getting uniformity of good definition with cut celluloid films is such a frequent one, not only with myself, but, as I am aware, with very many others who are working them, that I am induced to draw attention to what I consider their principal and almost fatal defect, in the hope that means will ultimately be found to remedy it, and thus prevent them (as seems to me probable) being abandoned by good workers. The economical and extrinsic advantages of cut celluloid films over glass plates are so well known and have so often been pointed out and admitted that it is quite unnecessary to mention them; but, in view of those advantages, it is all the more to be regretted that they are likely to be outweighed by one disadvantage which is a little difficult to remove.

I have, I think, used most, if not all, the film-carriers in present use, and the conclusion I have come to is that, for unvarying efficiency, they leave something to be desired. I have succeeded admirably with them at times, but my observation goes to show that success hinges to a great extent more upon the inter-relation of the film with the carrier than of the capacity of the latter to stand a variety of demands which are likely to be made upon it. An ordinary dark slide, made full in its measurements, will take a great number of glass plates of varying thicknesses and accuracy of cut. The fault of most film-carriers is, I find, that they are too accurately cut; and thus, if the film itself is also cut full, it is impossible to fit it in without considerable pressure, which is fatal to its "planularity." The knife or the scissors have then to be used, which is a nuisance.

Again, the tendency of all films, thick or thin, is to "curl in" with the coating, a property peculiarly liable to be influenced by temperature and other conditions. I find that this tendency is often not destroyed by the film-carrier, so that the film is not held in a perfectly plane position, hence it presents a concave surface to the lens. Theoretically I suppose, with an objective having curvature of the field, this would not be a disadvantage; practically, I find that the concavity is so considerable that it is impossible, no matter to what extent I stop down, to get universally good and even definition.

Of course I am here speaking of occasional experiences only. These are, however, so frequent as to seriously reduce the advantages of the use of cut celluloid films. Sometimes these are convex towards the lens, and then, in addition to the centre of the picture being out of focus, scratches from the shutter of the dark slide make their appearance on the film. I feel sure that any contrivance for holding these films, thick or thin, always plane under any circumstances, would be a great success. My experience of commercial film-carriers is that they generally fail in that regard, and a further drawback to their use is that they themselves usually buckle and bend on the smallest provocation.

JAMES R. HOPWOOD, Ph.D.

CONVENTION JOTTINGS.—IV.

A Run through Some of the Scotch Studios.

M. & T. SCOTT (West Saville-terrace, Edinburgh).

WHEN in Edinburgh, we paid a visit to the new photographic works of Messrs. M. & T. Scott. At the beginning of this year we made a notice of this place as a novelty when it was opened. Since then it has been completed, and we found it in full working order. We use the term photographic works advisedly, as the premises at West Saville-terrace are specially constructed for turning out large quantities of work, and that for the trade only.

Mr. Scott informed us that they had got their arrangements so complete, that they could turn out a plain enlargement and send it on to their customer on the same day that they received the negative—when such haste is demanded of them—but in ordinary circumstances four days are about the usual time to make, mount, spot, and send off an ordinary enlargement, from the time at which the negative is received.

When high-class work is required, however—and that is a special feature in their business—it takes fourteen days to finish and supply pictures of this class. One of the departments just introduced into the business is to undertake the finishing of photographers' own work, so that any photographer can send on his plain enlargements, and the Messrs. Scott will work them up at any price stipulated.

The arrangements and staff are so complete—this we doubt not—that engagements will be kept and orders sent out up to time in any department.

To convey some idea of the extent of the place and its appointments, we made the following jottings:—The ground occupied is about a third of an acre. The buildings on it cover 500 square yards. The enlarging and dark rooms are large, airy, and well appointed. The enlarging room is thirty feet by twenty feet. The enlarging camera is the usual—travelling on rails—pattern, with reflectors outside. For carbon work they have swing-covered dipping baths, large enough to take in a 60-inch plate. These baths and camera—and general apparatus in this well-appointed room—looked like a gathering of old familiar friends, belonging to the time when carbon, and nothing but carbon, was all the rage, before bromide and platinotype had come to the front.

All the sinks throughout are made of teak wood, and some of them large enough for the development of the extra-sized plates. In one section of the sinks we observed a very good arrangement, there being two outlets, one for the saving of the residue, and the other to carry away the waste water. All the pipes are glass-coated. The doors of the dark and enlarging rooms run on rails, and move along the surface of the wall; a heavy curtain is hung inside each to exclude all light. In one of these rooms they have a hot-water tank fitted, and, to utilise the space into which it is built, they have squared it up, thus forming a press, in which negatives, &c., can be quickly dried. The hot-water apparatus for supplying the establishment with hot water possesses the united advantages of doing a great deal well, and that at a very small cost. The boiler is a Cook's Star Boiler, with a circulating tank for sixty gallons. It produces hot water in twenty minutes, and continues all day at a constant, steady heat. You can have the water boiling if you so desire it, and Mr. Scott told us that, for an outlay of some twelve pounds, the whole thing was supplied and set up.

The studio, which is constructed and used principally for copying, has a double-ridged roof, so that it may be used as one, or divided into two studios, when necessary; the size of room is thirty by twenty-eight feet. The blinds for arranging the light are framed and run in grooves; there is a set of three grooves, and each fitted with blinds, so that any light, and any quantity of light, can be obtained at will. The arrangement works well, and seemed to us very complete.

The artist's rooms, printing rooms, and offices are all constructed for the meeting of any reasonable extension or requirements, and, in case of having to extend in any given way, the partitions are all composed of lath and plaster, so that at any time they can be removed without difficulty.

The Messrs. Scott's work, both artistic and plain, is so well known to the trade, that a passing comment is all that is necessary on that

point. The finished platinotypes in their place were many, and bearing the stamp of artistic feeling and careful handling. The demand for carbons seems large, both in engraving black and brown. Bromide work seems also to be gaining ground with them. We saw an etched negative and proofs from its very clever production turned out on the premises. We have seen the same class of work from America; and this sample we considered quite up to the American work.

We were shown some untouched enlargement views and groups, twenty-four inch, made from carbon negatives, as fine in finish as small work; and samples of opals as large as thirty-six inches; also pictures in carbon on ivory.

The professional who requires it can have all kinds of enlarging work produced here, and, as the proprietors hold, in the shortest possible time, whether plain, in black or white, water colour or monochrome.

Messrs. Tunny & Co. (13, Maitland-street and 19, Salisbury-place, Edinburgh).

We visited J. G. Tunny and Co.'s places, situated at 13, Maitland-street, at the west end of the city, and 19, Salisbury-place, Newington. These businesses are now carried on under the proprietorship and management of Mr. J. H. Balmain, who for some years previous to Mr. Tunny's death held the active management of the entire business, Mr. Tunny being laid aside from active work by lingering illness for a considerable time previous to his death in 1887.

In Maitland-street, which is the principal studio of the two, the entrance-hall and show-rooms are well and profusely decorated by all the various classes of work produced by the newest processes up to date. We found Mr. Balmain standing out far beyond the usual position of the ordinary artistic photographer, having embraced, and now working, some of the more complicated processes commercially.

In this business vitrified enamels are now a department of some considerable importance, and one that continues to grow. This is a natural consequence, seeing one of the first and best enamellers has retired from business, viz., Mr. A. L. Henderson, and the enamels produced by Mr. Balmain being of such a fine quality that the demand for these pictures will naturally come his way. His exhibits in this class of work have taken many awards, and the profession who visit our exhibitions have had many opportunities of seeing the fine quality of these enamel productions. Mr. Balmain is also an adept in *photo-gravure* work, which he undertakes and produces commercially for the trade. We have, on previous occasions, commented on the high state of proficiency Mr. Balmain has attained in this by no means easy branch of photography; but, as most of the profession has handled his work at one time or other, it is familiar to most.

In photo-lithography he also takes a part, and that one of the most important. He does not go to the length of producing the photo-lithographs, but from the originals he supplies the transfer to the printer ready to lay on the stone. With all these irons in the fire, so to speak, you can quite understand that Mr. Balmain is a very busy man.

In a talk which we had about printing-out paper, with which for some months back Mr. Balmain has been making a series of experiments, "For permanency the collodio-chloride coated paper is the best." Why so? we asked. "Well, you know, I find it much easier washed than gelatine, and I believe ever so much easier freed from hypo."

He brought some samples of collodio-chloride paper prints which he put into the frames in April to test their permanency, covering up one part of the print and leaving the other exposed in the usual way. When bringing them, he told us that he had not looked at them since the beginning of July, and at that time they had not changed a bit, keeping the full rich purple tone all over; but on opening the frames before us—alas!—all the purples had gone out of the exposed parts, leaving the pictures half purple, half brown. The brown, of course, was quite vigorous, looking more like a change in tone than fading.

"We will have to do a little more experimenting," said Mr. Balmain, as he laid the frame aside.

Pictures on opals are one of the prominent features in this business. Both Maitland-street and Salisbury-place studios are well known for the artistic class of work produced.

Mr. Tunny's was a name familiar as the art-science itself since the early days of photography. That the late Mr. Tunny stood during his valued career in the first rank of workers and investigators is a fact well known to all the practical photographic world, and that Mr. Balmain follows in the footsteps of his predecessor and keeps steadily moving ahead we feel assured, and we doubt not but the result of his labours will be profitable.

PHOTOGRAVURE.*

Relief.

Photogravure has now strangely invaded the letterpress department. It is one of the most curious and also most attractive marks of progress to see this thing—for the many blocks in half-tone now made are really photogravure plates in negative form—giving smooth places for black, and rough for light, instead of the reverse; but physically the difference is slight. (Mr. Dawson here exhibited four prints on one sheet, two being on a copperplate, and two on letterpress, remarking that the little plates in the various art *brochures* now so popular were all identical with photogravure plates, even to a large degree physically. There were differences, but they were slight.) It still remains to be noted that all the previous rules as to detail and transparency must apply, there can be no hard, flinty uniformity in the tint if it is to be approved by careful judges. Of course, some printing by machine is much rougher than others, and always must be; but it will not alter the proposition. It thus follows that the hard, square, crossed tint, however neat and regular, must be superseded sooner or later; indeed, regular mechanical work must give place to sympathetic rendering. Of course, this lies in the future, but it presses already, and has pressed; all artists say, "I hate that square grain," and a publisher will say, "I hate it too, but, if it must be there, let it be too fine for me to see it."

It should thus be borne in mind that when worked with that special view various methods hitherto employed for making an intaglio plate are suitable for the making of a relief photogravure. The vast bulk of this work is done by the old process of Niepce without and variation, by printing into a thin layer of bitumen, developing, any biting out with several stoppings. In France intaglio plates are constantly produced in this way. There is a large republished series of Albert Dürer, and they are all done in that way; they are bitten through a thin film of bitumen, and to make them deeper a man goes over them with a graver. The Pretsch process is a simple swelled gelatine surface. It has the advantage of not having pigment in the gelatine. These (shown) are Pretsch plates. Pretsch himself died long ago, and, so far as I am aware, no one has ever worked the process but myself. They can be printed in relief as well as in intaglio. Another way is by the Klic process, which renders most of the tints sweetly and consecutively, but is rather fine in the grain, and wants very careful rebiting to produce a printing block. And the worst part of rebiting, however skilful, is the necessary stopping out, which will always show itself. It is the want of a real, true, good method of photogravure in relief which keeps back its employment for scientific work where it is not lawful to touch with the hand to help out any matter of detail. If a man brings a scientific subject, he wants it correct, he does not want a sight of handwork on it, it would destroy its value. In anatomical plates it is impossible to have a method that demands the help of the hand. Of course, there is a difference in *demanding* the help of the hand, and having a little now and then occasionally; but I do not despair of arriving at this point of perfect reproduction in relief where management and skill can be made to supersede any mere hand work.

Colour.

Printing in colour shall conclude my rather vagrant paper, but there is a strong affection in the English mind for colour in prints, and from the earliest days of printing this has been observable. The missals which the monks were given to illuminating were followed by early printed books with the printed illuminations coloured by hand.

By the plate method colour is most suited to the lighter class of subjects. As the tint gets darker, the colour is found to be unable to give the required depth and power unless the plate is correspondingly deep. It, however, remains that the photogravure intaglio plate is the sweetest method yet known for printing in colours. Sometimes a water-colour drawing comes out so perfectly that you really cannot tell the copy by the side of it, and, when it is known that this coloured

* Concluded from page 524.

copy is a production of the press capable of multiplication, the result is all the more surprising. This way of colour printing lends itself to very subtle blendings of tint, such as are quite unknown to other modes; but, although producible in number, they are not very easy to do excellently well, and it is very usual to have to go over them afterwards with water colour. Consequently they are valuable, and, as prints go, rather scarce; but they are well worth producing, for the simple reason that the photogravure gives us the artist's touch, and this adds the charm of colour, thus bringing us very near to the artist. And, as I began, so I conclude, with the keynote that nearness to the artist is the most worthy aim of all reproductive methods. When water colour in its light touches is produced, it still remains to produce oil colour in its power, and very lovely I feel it will be to see this happy result.

It may be asked of me if I see any way of printing naturally reproduced plates with nature's selected tints. There was a method years ago for doing parcel plates in three or more colours by extracting them from an already prepared plate engraved in the ordinary way. There would be a mezzotint plate, and the areas of green and blue, and so on, were mapped out. Then you would electro copies, and scrape out from one what was not wanted for blue, from another what was not wanted for red, from a third what was not wanted for yellow. The consequence was, that by printing in careful register you got a very decent colour result, and one of my copperplate printers once used to print them. They were very nice at times, but, of course, entail three or four printings, and register in copperplate is a very difficult business. The process was patented, and some old printers still living have printed them. The paper was good and strong, so as to print three or four times in the copperplate press for the various colours without expanding and destroying register. Now, the nature-selected tints will depend on their results upon the limitation of this old, old process. I do not see how there is any way of inking a plate by an automatic method, and of course it must be by the medium of printing ink that the thing must be done. I do not see any way of inking a plate in nature's colours. And, on the whole, I incline towards making a nature monochrome plate and inking it in to taste. It must be remembered that by parcel or register printing on the copperplate press the delightful plate mark and broad margin are impossible, but by colour printing as above described these are preserved.

I must here conclude, but would in doing so throw out a hint that a fair history of the whole of the photogravure processes would form an attractive subject for such a Society as this, especially if small examples could be given from each. I think examples from the earliest days ought as soon as possible to be got together in a proper form, either as a single album deposited at the British Museum, or multiplied and distributed in the usual way.

[At the conclusion of the lecture, Mr. Dawson handed round examples of various processes of photogravure, and the Chairman remarked that the lecturer was so familiar with the different methods that he had referred to them simply as "the so-and-so process," but probably there were many gentlemen present who would be glad of details.

Mr. Dawson thereupon remarked, that all photogravure methods were based upon the autotype process, the Pretsch process being an exception. The Waterhouse method consisted in covering the tissue, when in a state of soft jelly, with sand or ground glass, which produced little notches over the entire surface. When dry, the business was to get the sand off again, and that was a business, for, of course, it was glued on, but the method he had adopted was very simple. He put the sand or glass into a ladle, together with a little knob of stearine or spermaceti, and heated the whole, by which means each particle of sand or glass became coated with the stearine or spermaceti, and, when put on the tissue and dried, could be easily rubbed off. Sometimes it would stick; but, as a rule, it all came away, leaving granulation on the surface. The fault was, of course, that it went up and down too much, and held as much ink in one place as in another. Then, there was the perforated method—his own. Before the tissue was placed under the negative, he rolled a mixture of tallow and stiff oil all over it, and then powdered it all over with bronze powder. In printing, the light only got through in the little cavities (shown by diagram), and it developed in little knobs—big knobs and little knobs—producing what he called a perforated mould. The great difficulty was that the picture could not be very well seen on the plate, the little bright remainders were so glittering. The great charm of the Klic method was that the details were clearly visible upon the plate. It was most important that there should be a healthy grain in the plate, and that the details should be clearly visible for working up. The large pictures exhibited were all done by what was called the Goupil method, although it was invented by Mr. Woodbury—an Englishman—and was an English method. He hoped that would not be forgotten. The process was kept strictly secret, but he believed it consisted in the preparation of a pigmented gelatine tissue over-saturated with soluble lumps of some hard salt. After printing, these lumps were dissolved out, leaving the picture like a sponge on the plate. It was undoubtedly the finest method known, and he was sorry it went abroad and that it was concealed. He also drew diagrams on the blackboard to explain the working of the Klic process.]

A. Dawson.

ADVANCED PHOTOGRAPHIC WORK FOR AMATEURS.

VII.

Perhaps, within the whole range of photographic practice, there is no more attractive style of printing to those intimately associated with, or who are outside the pale of, photographic knowledge than that of vignetting.

An operator who knows well his business will, at the outset—especially in the case of portraiture—select only such backgrounds as will lend themselves more particularly to this especial style of printing (and, as a rule, those of a light tint are best suited for such). But there are, unfortunately too often, cases where copies have to be made from prints, or where portraits have to be abstracted from groups in negatives under circumstances where the original backgrounds are not in any way suitable for vignetting, and therefore it frequently devolves upon a worker to make the necessary alterations upon such prints or negatives as will permit of their throwing off pleasing results in vignette form.

A very common case is when some figure forms part of a group, and which it is desired should be abstracted, either with the view of printing singly such portrait in *carte-de-visite*, cabinet, or other similar, or of slightly enlarged size. Very seldom indeed will such cases be found to have suitable backgrounds, and in nine cases out of ten, on the contrary, they will most likely be almost certain to offer just about the most unsuitable conditions for being printed singly in any form, and hence many even clever operators are frequently puzzled how to treat a case of this kind. In such cases, when the original negative is forthcoming, it is always preferable, in my opinion, to deal with it, and not from any print from such, and therefore every exertion ought to be made to obtain the negative with such in any one's possession, no matter how unsuitable the background or surroundings may be, much may be done towards pulling off, either in an enlarged or similar size to the original, a vignetted print from such. To do this, the first step to be taken is a careful block out on the original negative of all the surroundings; and there is one right, and many wrong, ways of doing this blocking out. To many the operation may seem extremely difficult, but in reality, when thoroughly understood, the work is one of much simplicity and ease, provided it be gone about in a businesslike manner. And, first of all, a good retouching desk is necessary; then a good camel's-hair brush, with a long point. (I say camel's-hair, because experience has taught me that, no matter how others may advocate sable, I have always found suitable camel's-hair brushes better than sable for blocking-out purposes), but they must be well selected, and only those that have fine, tapering points used. When such are obtained, they ought to be most carefully guarded from injury, for a good brush is a great acquisition. The next item of importance is a good stock of Indian ink, and here a few words of advice to a novice is necessary. For a modest penny a stick of Indian ink can be purchased from any stationer, and it does seem such a simple matter to those not accustomed to water-colour or blocking-out work, such as we are considering, that with such, and a good brush, all that is necessary is to wet the brush, very likely by placing same in the mouth, and then by rubbing on the Indian ink to obtain sufficient colour as will block out the portions required. Now, I know this is a very common practice, but it is a very slovenly and wrong one to acquire, for it will, before long, ruin the best brush that was ever produced; therefore never attempt filling a brush in such a way. When a cake or stick of Indian ink is acquired, get a common egg-cup and proceed to rub the entire stick down, or melt it in a small quantity of water—say, about as much as will half fill the cup. To do this some little time will have to be taken, and also a fair stock of patience, but this will be amply repaid when the entire stick is melted and the work of blocking out has begun; and, should it, in future time become somewhat dry or too thick, all that is necessary is to apply more water till it is of the proper consistency.

With such prepared, a worker is now ready to proceed to block out the most intricate class of work. To those whose eyesight is all that is desired nothing further is necessary than to lay the

negative on the retouching desk, and proceed carefully to go round the outline of the figure on the film side of the negative (which should have been previously varnished); but, alas! how often does it happen that, before any one sufficiently advanced in photography is called upon to do such work, their eyesight is not what it was, and mostly likely such will require the aid of a magnifying-glass of some kind to enable them to trace closely the finest lines in the work before them. Now, when such is the case, I have no hesitation in recommending a worker to simply employ a pair of strong spectacles in preference to any magnifying-glass. When such are used they permit of both hands being free, and far better and finer work can be accomplished than by the use of a magnifying-glass held in one hand whilst the other wields the brush. To any retouchers, or those who have never tried the comfort of spectacles *versus* magnifying-glasses, I say, not only on grounds of economy, but for solid comfort of working, use strong spectacles, if it is only for a very few minutes when the utmost fine work has to be done, such as touching out very fine spots, or by taking out dark portions with a needle point; then spectacles will be found a friend indeed, and they need not be constantly used.

Having gone carefully round the outline of the face and the figure well over the breast only, proceed to completely block out for some distance the rest of the surroundings with the Indian ink, it is not necessary to fill in the entire negative; this may be done by pasting on paper on the glass side. The parts, most likely, that will give anxiety and trouble are the outline of the face; but this never bothers one who has experience in the work, and all that is necessary is for even a beginner to exercise the smallest amount of care in following, as nearly as he can, the exact outline even in profile work. Should it be found that, from nervousness in a first attempt at blocking out a profiled face, the colour has been allowed to impinge beyond the true line of the face, do not, as one is very liable to be tempted to do, proceed to attempt with the finger, or any other means, to remove the ink; rather let it remain (like weeds sown with good seed) until the whole is finished, then set aside to dry, and, when such is accomplished, get the missus to give you a coarse darning-needle, and with the point of this lightly touch off the colour from the parts the ink encroached upon. Provided the blocking out has been allowed to dry well, there is no risk or trouble in what I may term mere trimming up the work with the aid of a darning-needle, there is danger in using such, although I know many of my pupils at first stand aghast at my suggesting the use of a needle; but they soon get to be quite adepts in its use, and the real difficulty lies in keeping them within reasonable bounds in using it.

When such a figure has been carefully blocked out, take an ordinary piece of albumenised paper and place in contact with the negative in a printing frame, and print to necessary printing depth. We have now a print with a pure white background, and the next step is to vignette the print. This is also a matter of great simplicity when once understood. Of course, it would never do to place the printed image in printing frame without some protection to the face, &c., therefore recourse must be had to some method of shielding the face and figure whilst the white background is being tinted by exposure in a printing frame to daylight.

Now, some workers advocate the use of a cut-out mask, carefully adjusted over the face of the print; but, after a somewhat lengthened practice, I have come to a very decided opinion that a much better method is not to use any mask or cut-out shield, but to subject the print itself to a further blocking-out process, and this is easily done with the Indian ink and brush previously referred to. Take the print into a darkened room and, with the aid of good candle or gaslight, lay it flat down on a suitable support, and, with the aid of the spectacles (if such be necessary), proceed to cover over the entire image with Indian ink.

Taking care not to block out beyond, or to go into, the white background, it is by no means a difficult job, and really resolves itself into a tracing operation, which any schoolboy can and does often practise at school. This done, set aside to dry. Don't be afraid that your operation will hurt the surface of the paper—that won't take any harm. When dry, your picture will have the appearance of a silouhette of olden times. Place same on a printing frame carrying a sheet of glass, and proceed to adjust a vignette cover over the frame; this done, expose to daylight—a few minutes will suffice to tint down the background round the face and figure, and, when dark enough remove from the frame, and proceed to tone and fix the print. The first washing water will, with the aid of the fingers lightly rubbed over the surface of the print, remove the Indian ink, then toning and fixing goes on just as usual. One or two trials will enable any worker to easily accomplish what was considered a most difficult feat in photography. This is one way, and a very reliable method of removing an undesirable background.

There is another very common trouble of a similar kind met with, more especially when printing lantern slides from negatives that are thin, or in cases where the faces are not relieved with light or suitable backgrounds. I refer to such cases where it is desired to print a slide in vignetted form, the negative of which has a dark background. I have known this operation puzzle many workers also, and yet it is very easy when properly gone about.

Take the negative, no matter what size it be, and place it on a retouching desk. Then, with the aid of some oil paint on the glass side, with a brush draw a suitable vignette shape round the head and bust. Crimson lake, or Prussian blue, or any other transparent colour, should be used, and, having drawn a suitable shape, with the pad of the finger proceed to dab down the inner edge of the circle of paint. Set aside to dry, and to assist such it will be found the addition of a little pale drying oil to the colour will tend to facilitate matters in this respect. Next take a colour of a non-transparent nature, such as black, and go round the outer edge of the transparent ring. If the first attempt does not sufficiently blend or soften the inner edges, go over it again with the colour and finger until the negative itself has been virtually turned into a vignetting glass, then go ahead and print with an absolute certainty of success. This is a very useful dodge to follow in many cases, and I have known instances where the outside edges of the negatives ran close into the image where it was the only possible way of vignetting such. T. N. Armstrong.

ON DEVELOPMENT OF "INSTANTANEOUS EXPOSURES."

[London and Provincial Photographic Association.]

When our Secretary unfortunately (for me) asked me to open the discussion to-night on the development of instantaneous exposures, I asked to be excused, as I do not think that I can add any new facts to the already voluminous instructions, formulæ, and treatises on the subject; all that I can do is to state a few of my own experiences and methods of working. I must premise my statement by assuming that what is meant by development of instantaneous exposures I presume to interpret as the obtaining the best results from plates that have had a bare or insufficient exposure, because, although full exposure is often attained and even over-exposure occasionally met with, I take it that the difficulty lies in obtaining the maximum of detail—with other good qualities—with the minimum of exposure. Bearing this in mind, I will now state the different developers that I have used and the advantages and disadvantages that I have found with them.

I started with pyro and ammonia, and quickly found that, if used beyond a certain strength (the ammonia, I mean), chemical fog invariably ensued; the same effect was caused by longer development with a weaker solution, and in both cases iridescent surface markings were produced, while the smell of ammonia is very objectionable to me. Of course, if bromide is used, the fog can be prevented, but only by the sacrifice of shadow detail and good gradation.

When hydroquinone was introduced I hailed it with delight, as I thought that the above defects would be cured; and so they were, but other disadvantages cropped up. With carbonate of soda, the time taken to develop a plate was abnormally long—with potassium carbonate it somewhat shortened, but frilling was much in evidence—but the most serious objection in both cases was that the scale of gradation obtained was bad, the high lights completely blocked up, the half-tones weak, and the fine detail in the shadows worth nothing when printed; in fact, the negatives were very hard. Then the caustic alkalies were tried; and with caustic soda I worked for some time. More detail was obtained, and at the same time the high lights were less like lumps of coal, the gradation better (apparently), and the negatives nicer to look at; but their prettiness was deceptive when you came to print. Although they looked sparkling and strong, the prints were very much the reverse. I also fancied that the grain of the deposit was much coarser, owing, perhaps, to the rapidity of development, which was extraordinary compared with the carbonates in warm weather, but temperature played havoc with the time taken, and also with the results. In the winter half an hour would sometimes pass before the image began to appear, and when development was finished the plate had all the defects common to those done with carbonate.

In hot weather, the deveveloper was quite unmanageable; bromides certainly made it usable; but the resulting negatives were again hard, so this was given up. Caustic potash gave the same characteristics, with the addition of causing frilling "in excelsis."

Eikonogen I tried, but not extensively. I could not get sufficient

vigour, although detail was abundant, and the grain of the deposit very fine indeed.

I now come to a developer that I think fulfils all the requirements that one can desire, that is to say, all the detail in the shadows that is possible, vigorous high lights, without the undue blocking up characteristic of hydroquinone; no chemical fog with even prolonged development, the half-tones well rendered, and the printing capacity all that can be wished, the grain of the deposit is fine, and the colour of the deposit a greenish black, which I, and I think many others, prefer to the bluish and greyish blacks produced by hydroquinone, eikonogen, &c. The developer I refer to is pyro and soda compounded in the following proportions:—

Pyro	480 grains.
Soda sulphite	4 ounces.
Citric acid	30 grains.
Water to	10 ounces.
Anhydrous carbonate soda	480 grains.
Soda sulphite	160 „
Water to	10 ounces.
Take of pyro solution	20 minims.
„ „ soda „	240 „
Water up to	1 ounce.

I have said, Take of soda solution 240 minims, this is the quantity I generally limit myself to per ounce; but I of course do not add it all at once, in five cases out of ten not more than half the quantity will be required. Bromides I never use excepting I fear much over-exposure, I prefer to increase the quantity of pyro.

You will notice that the quantity of soda sulphite added to the carbonate solution is in the proportion of 1 to 3 of the carbonate, this I have found to be the best adjustment of the quantities in order to obtain the colour of the image I have previously mentioned, namely, greenish black. If more is used, a pure black image is the result. If it is absent entirely the negatives are liable to get stained, I lay stress on the use of pure anhydrous carbonate of soda. In my idea it does not stain the gelatine so much, it is a definite compound, is not subject to deterioration, and is stronger. I must ask you, gentlemen, to understand that what I have said only refers to my own individual experience, I have no right to assume that others, having more knowledge and experience than myself, are not equally and more successful with the developers that I have maligned. Other reducing agents I have not tried because I am quite satisfied with the one mentioned, and I very much deprecate constantly changing and experimenting with developers and plates.

E. W. Parfitt.

THE PHOTOGRAPHIC MAP OF THE HEAVENS.*

The first number of the second volume of papers published under the auspices of the Permanent Committee charged with the execution of the photographic map of the sky has made its appearance, says *Nature*, at a sad moment in the history of the undertaking, for, simultaneously with its appearance, is announced the death of him who, more than any other man, has contributed to its success and brought it within the range of practical science. Admiral Mouchez has known how to secure, not only the active co-operation of many astronomers, but also how to make them zealous in the great work, the arrangement of the details of which has occupied the last years of his life. He has awakened enthusiasm for the success of his scheme, and smoothed many difficulties which might have hindered its progress, and probably few undertakings of equal magnitude and equal importance, breaking new ground in many directions, have been got under way with less friction and fewer disappointments. We may well hope that the same suavity and diplomacy which has characterised the conduct of the late Director of the Paris Observatory will be found in the counsels of his successor, and that a work begun in so much hope will be carried to a successful issue.

The papers in the volume before us can be brought roughly under two heads, both, notwithstanding the lapse of time from the inception of the scheme, betokening an initial stage in the preparation. One of the topics under discussion has for its aim the selection of a method which shall secure on the photographic plates, destined ultimately to furnish a catalogue, the impression of stars of the eleventh magnitude with certainty and uniformity; the other, a means of deriving the co-ordinates of the star images so impressed with the greatest facility and sufficient accuracy.

To deal with the second of these proposals first, we may remind our readers that, whatever method of measuring the positions of stars on a plate may be adopted, the resulting co-ordinates must be purely differential, and probably referred to the axes of the *réseau* impressed upon the plate as a latent image, and developed under the same conditions as the stars themselves. To pass to the determination of R.A. and declination, a great deal of information, entirely independent of photography, will have to be made available. The readiest means of effecting this last step in the reduction, as it appeared to a committee of experts appointed to consider the question, was to determine, by meridian instruments, the actual co-ordinates of six stars on each plate. It is needless to comment upon the magnitude of the labour thus undertaken, or, at least, contemplated. This preliminary work would demand a catalogue of some sixty or seventy thousand stars, most of them below the ninth magnitude, and not found in existing catalogues. In order to give to each determination the necessary accuracy, it is desirable that each star should be observed twice in both elements, and at two observatories. When we remember the length of time that the re-observation of Argelander's zones has consumed, and is still incomplete, we can form some estimate of the time that must inevitably elapse before the results of the photographic catalogue can be made available for astronomical purposes.

In presence of these difficulties, and many more which occur to the practical astronomer, we must be very grateful to M. Loewy for elaborating a scheme which, if it be found practicable, will materially shorten the time necessary for the production of the catalogue. M. Loewy proposes to avail himself of the fact that the plates are taken in two series, in such a manner that each corner of a plate in one series will form the centre of four other plates in the second series. When, therefore, the astronomer has determined the rectilinear co-ordinates of the stars on *one* plate relative to the central lines of the *réseau*, each of these stars will belong in common to the plate considered, and to one of the four plates in the second series, partially covering the first. M. Loewy's scheme consists in making the stars on the four plates thus connected available for the reduction of the first. And, on paper at least, it is not difficult to extend the scheme still further, and to make the plates contiguous to these four contribute to the reduction of the original plate by means of an extended triangulation. In this way a plate would not be considered as an isolated fact, but a considerable area, of 36, 64, 100, or more square degrees could be woven into an harmonious scheme of reduction. And such a plan possesses this very obvious advantage, that on even a lesser area, as of 36 square degrees, we may well expect to meet a sufficient number of bright stars whose places are already so well determined that the reduction of the plates could go on immediately without waiting for the observations of the stars on the meridian. And, independently of this evident advantage, it seems highly probable that two of the elements of reduction—viz., the orientation of the plate and the value of the scale—will be determined more accurately if the stars which are used for the derivation of these corrections are separated by a considerable distance—that is, greater than a single negative would permit.

M. Loewy considers the various sources of errors and their necessary correction with all the detail required to submit the plan to practical application, and this is precisely the test that is needed. This appears to be also the opinion of Dr. Gill, expressed in a very cautious approval of M. Loewy's scheme, and he further quotes a remark of Professor Anwers, which contains a very salutary caution. That astronomer points out that the reduction of the catalogue plates will be most accurately effected from to position of *faint* stars, rather than from bright ones. In that case, since our present most accurate catalogues do not give the position of the fainter stars, those catalogues will still need to be supplemented by many meridian observations. Dr. Sande Bakhuyzen, however, expresses the opinion that the zones of the *Astronomische Gesellschaft* will, when completed, furnish the necessary data for all reductions, or, at most, require additional observations in some portions of the sky, which he is able to point out from a careful examination of the number of the stars contained in these zones.

The second topic which has received much consideration in this volume is, as before mentioned, the adoption of a method to secure the registration of stars of the eleventh magnitude. It will be remembered that the International Congress of 1891 proposed to place in front of the object-glass of the telescope screens of fine metallic gauze, identical in manufacture, and of such construction that the amount of light impeded should be equivalent to two magnitudes, the coefficient 2·512 being employed as the ratio to express the relative brilliancy between two consecutive magnitudes. A Committee was appointed to carry this plan into execution, but the report which this Committee has issued is unfavourable to the adoption of the method. The signatures of the Astronomer Royal, Professor Pritchard, and the brothers Henry are attached to this report; but M. Vogel, the remaining member of the Committee, has not found the reasons assigned by his colleagues sufficient to warrant the rejection of the scheme, and consequently his name does not appear. The Presiden

* *Bulletin du Comité International Permanent*, tome ii., premier fascicule.

of the Permanent Committee thus sums up the case against the proposal. Light, in traversing a metallic screen of bright threads and very narrow mesh, seems to experience, besides the ordinary effects of diffraction, certain modifications, whose cause is not yet explained, and which the Congress could not foresee when they framed the recommendation. This peculiar behaviour of the light demands further study, and renders the application of this means very difficult, if not useless, for the purpose for which it was proposed, since the discrepancies of the results obtained are greater than the error which an experienced astronomer would make in estimating stars of the eleventh magnitude.

The experiments on which this conclusion is founded are set out in considerable detail, and a careful study of these experiments ought to convince an unprejudiced critic that the Committee was justified in advising the rejection of the screens as an adequate and efficient means of deciding upon stars of the eleventh magnitude. It should be stated that the gauze screens, identical in character, were furnished by Professor Vogel, and, though there is no mention of the experiments or processes which induced the Potsdam astronomers to select a screen of this particular obstructive power, it is to be presumed that in his photographic telescope they stopped the amount of light proposed by the Congress. It is not the least curious feature in the discussion (controversy would be far too strong a word to describe the courteous paragraphs in which the various astronomers set forth their reasons for dissent from the able physicist) that Professor Vogel takes no part in it nor vouchsafes any information as to the principles by which he was guided in the selection, but leaves the onus of rejection entirely to his colleagues, who are thus placed at a disadvantage.

Professor Pritchard, whose photometric researches permit him to speak with authority, has stated concisely the result of his experience. He found that on the ordinary astronomical telescope, achromatised presumably for D, the amount of light obstructed was equivalent to 2·4 mag., and on the photographic telescope, with a minimum focal length for G, the amount of light lost was not less than 2·8 mag. The Astronomer Royal reports that the action of the screen on the Greenwich telescope is to stop 2·5 mag. This result was deduced by comparing the seventh and ninth magnitude stars of Argelander. Some further comparisons of the obstructed and unobstructed light of stars of the ninth and eleventh magnitude, photometrically examined by Professor Pritchard with the wedge photometer, confirmed this result, and further proved that the scale of Pritchard and Argelander was in very satisfactory and close agreement. It will be necessary to return to this point. M. Henry, at Paris, offers results in close accordance with those of the two English astronomers just quoted. He finds that the screen proposed by M. Vogel as effective in his instrument stops between 2·5 and 2·7 mag. on the Paris telescope, and this effect is still further confirmed by some observations by M. Trépied, while M. Rayet, at Bordeaux, finds 2·7 mag. represents the effective action of the screen. Very different is the experience of M. Donner, of Helsingfors. His method of estimating the loss of light is different from that employed in the other cases, and is perhaps not without objection; but the result which he derives from his observations is that the light of a star, in passing through the screen, loses only 1·6 mag.

It is now necessary to describe very briefly the methods employed in the various observatories which have led to these discordant results, the more so as one eminent authority, Dr. Dunér, of Lund, who apparently holds a brief for Professor Vogel, has taken exception to the results deduced. Leaving on one side the experiments conducted by MM. Henry and Trépied on artificial stars, and against which Dr. Dunér urges no objection further than that they are founded on artificial stars, we find that one principle pervades the examination conducted at Greenwich, Paris, Bordeaux, and Algiers. The several astronomers have determined what length of time is necessary to produce a blackened star disc of the same diameter from the same star with and without the screen. In this way it has been found necessary to expose for ten or eleven times as long with the screen before the object-glass as without, and from this fact it has been inferred that the loss of light occasioned by the screen amounts to 2·5 or 2·6 mag. It is urged that, if only two magnitudes were lost by obstruction, the necessary exposure would have been $(2{\cdot}512)^2 = 6{\cdot}3$, that required by the unobstructed object-glass. Dr. Dunér remarks on this that those who have condemned the employment of the screens on these grounds have argued in a vicious circle, and to be logically correct it would be necessary to show that the intensity varies as the time of exposure or—

$$it = \text{const.}$$

Against the accuracy of this law Dr. Dunér urges that reports of the observers themselves show three distinct proofs. In the first place (1(Dr. Donner states that only 0·58 mag. is gained by successively multiplying the length of exposure by 2·5; (2) that the Astronomer Royal proves that a gain of 1·7 or 1·85 mag. is secured by multiplying the length of exposure by 6·25; and (3) that MM. Henry have found that to obtain similar discs from stars of the 9·3 and 11·3 mag. the exposure has to be increased from 28 sec. to 240 sec. (1 : 8·6). These three experiments give instead of 2·512 respectively,

3·28, 2·69, 2·93,

results apparently incompatible with the formula—

$$it = \text{const.}$$

MM. Trépied and Henry reply at length and effectively to these strictures. They do not regard 2·69 and 2·93 as differing so greatly from 2·512 but that the discrepancy may be fully explained by inaccuracy and paucity of observations. The Helsingfors result (3·28) they refuse to accept as unequivocal evidence in the face of established facts. The method of Dr. Donner consisted in comparing photographs of the Pleiades, taken with and without the screen, with the map of M. Wolf, and marking the number and magnitude of the stars which have black or grey images. This method, as already hinted, does not seem to be entirely free from objection. Admitting that the comparison of the images was made, as we are sure it was, with all the care possible, there is still room for the varying exercise of individual judgment as to what constitutes a black and what a grey image, and the final result is likely to be less exact than a process based upon rigorous measurement.

The method employed by Professor Pritchard is, perhaps, as free as any from objection or misinterpretation. He exposed the plate for *equal times* with and without the screen, and then measured the diameters of the resulting star discs. If two discs, produced one with, and one without, the screen were found equal in diameter, then the effect of the screen is equivalent in photographic action to the original difference of magnitude between the two stars. This difference of magnitude was determined by the wedge photometer, and the only exception that can be taken to this determination is that the scale of the wedge photometer may not be accurately applicable. But here we have the distinct assertion of the Astronomer Royal, reiterated again by M. Trépied, that the Pritchard Argelander scales are in very satisfactory accord. This circumstance is the more gratifying for two reasons. First, because it is distinctly stipulated in resolution 19 (1889), "Chaque observateur devra s'attacher à obtenir sur ses clichés destinés au catalogue la grandeur 11·0 déterminée aussi exactement que possible *au moyen de l'échelle d'Argelander*." The maintenance, therefore, of the scale of Argelander becomes of paramount importance, and this one could scarcely hope to effect by means of the gauze screens. The second satisfactory point is, that Professor Pritchard is endeavouring to secure uniformity in the photographed stars by distributing among the participating observatories small charts of particular regions of the sky on which are marked stars of the ninth and eleventh magnitudes approximately. Naturally, in the determination of the magnitudes of the stars on these charts, the scale of Argelander will be perpetuated; and, inasmuch as the testimony of several astronomers is distinctly in favour of making use of these typical areas, it seems very probable that Argelander magnitudes will be prolonged in the catalogue work down to the faintest stars impressed.

HARMONISING HARSH NEGATIVES.

[North Middlesex Photographic Society.]

THE subject of my paper is one for which, if dealt with by a competent person, probably no apology would be necessary. I am fully impressed with a sense of my unfitness for the task, and the only excuse I can offer for touching it is that when, in the course of my duty, I have requested some of our members to take up the corner of one of the large subjects as the theme for a paper or demonstration, I have been met with the rejoinder, "Why not try it yourself?" I am consequently in the unenviable position of a man who attempts to put his own precepts into practice.

Probably the most scathing and unanswerable criticism upon pictorial photography is that our prints are too black and white, too violent in contrast, that when viewed at arm's length they appear to be masses of black and white without relief in the shadow or gradation in what should be the lighter half-tone, or, if both are to some extent secured, the general effect is poor and flat. This criticism, though not applicable to the pictures produced by our better workers, is, unfortunately, too true when applied to the prints made by the majority of our rank and file, among whom I may claim to have a place.

The cause is not far to seek. A moment's reflection will serve to show that no process can reproduce nature's black—the total absence

of light as in the case where our darkest shadow is some spot where light cannot penetrate; nor can it reproduce nature's highest light—light itself, or light reflected from water or other bright surface. Our deepest black and whitest paper fall far short of these extremes; and, even if it were possible to secure in a negative the full scale of light and shade as seen in nature, it is certain that no printing process on paper can give the gradation found in a strong negative.

If we expose a plate rich in silver, and preferably isochromatic, on some well-lit subject, showing deep shadow in the foreground, and having strongly defined clouds in the sky, and develop in the ordinary manner, we will have a negative in which the shadows are nearly clear glass, and the cloud-forms, though extremely dense, will yet be clearly perceptible. On making a print, we will find that, long before the faint shadow markings in the clouds are impressed upon the paper, possibly even before the distant portions of the landscape are visible, the darker half-tone will be one mass of black. Our printing process is only capable of rendering one end of the long scale of light and shade in the negative. Some compromise must be attempted. Artists have their own methods of overcoming the difficulty, and vary them to suit their subjects. In some cases they may use up the longer portion of the scale at their command in translating the lighter half-tone and compress the shadows into the remaining portion. In another case they may employ the opposite method, the shadows and darker half-tone may be fully rendered, and the lights compressed. In a third case the whole scale may be uniformly compressed within the limits of the medium of expression; but the favourite method appears to be to introduce two or more scales into the composition, with the result that, while the lighter half-tone may be much darker than in nature, yet, the local contrasts being preserved, the painting or drawing conveys to the eye much the same impression it would receive from the scene in nature.

It is for us to consider to what extent we can make use of these methods in photography.

When we mask the landscape portion of a negative to allow the clouds to print out, or when we combine in the prints clouds from another negative, we are introducing two scales of light and shade into our composition. Masking and double printing, or sunning down parts of the print, are the readiest methods of obtaining harmony in what would otherwise be harsh prints. But, when the lights and shades are intimately mingled, masking is difficult, and sometimes practically impossible, and the results of running down are sometimes far from pleasing.

If now we attempt in making the negative to compress the full scale of lights and shadows within the limits of our printing process (and this is quite possible by the method recommended by Captain Abney, *i.e.*, by developing first with full quantity of ammonia, and just a trace of pyro and continuing the development of the ghost image so obtained with full quantity of pyro and little ammonia), we are met with another difficulty, that of flatness, and here I would like to quote from an article in the *Photographic Quarterly* for April in this year, entitled "Nature's Light Scales as Rendered by Photography," by Mr. H. Dennis Taylor. Mr. Taylor says (pages 180, 181, 182):—

"——the eye's appreciation of rather high contrasts and great variations in them is clumsy and indiscriminating; extreme contrasts of 1 to 10, or, better still, 1 to 20 in a photographic print yielding to the eye much the same sort of impression as extreme contrasts of 1 to 50 or more in nature, would yield, especially when the print is not directly compared to the original scene. But it was also shown that, although to the eye one high contrast is much the same at another high contrast, nevertheless the eye is extremely sensitive relatively to variations in those moderate contrasts which exist between contiguous features and details of natural views, and which give them their distinctness and relief.

"Hence it follows that, while such extreme contrasts as 1 to 15 or 20, which are available in a photographic print, will do very good service for giving an idea of very much higher contrasts existing in nature, still those moderate and delicate contrasts existing between the essential details of the natural view cannot be lowered in value (by that compression of the light scale which is necessary and unavoidable in the print) without the eye being at once struck by the divergence from reality, and being disappointed by a flatness and want of vigour which does not do justice to the original."

And again:

"As a still more telling illustration or proof of the above statement, let a long series of small rectangular spaces be imagined in immediate contact, each being exactly $1\frac{1}{99}$ (or 2 per cent.) brighter than its neighbour on the left. If there are 325 of these strips, the photometric contrast between the darkest on the extreme left and the brightest on the extreme right will be as 1 to 100. Now, a difference of two per cent. in brightness between two strips in immediate contact is easily perceptible to ordinary eyes; therefore all the strips would be clearly distinguishable from another, and would constitute the *details* of the series. Now let a photograph of the series be produced in such a manner that the contrasts between the two extreme strips is reduced from 1 to 100 down to 1 to 5 (a trifle over). The light scale is thus very strongly compressed, and it then follows that the contrast between any two contiguous strips will now be as 1 to $\frac{1}{99}$ or a difference of $\frac{1}{2}$ per cent. instead of 2 per cent. as before. Now it has been proved by careful experiments with the experimental top that such a small contrast as this is absolutely imperceptible to ordinary eyes. Therefore it follows that the rectangular strips will *no longer be discernible*, and that the whole effect would be that of a gradual and unbroken shading from one extreme of the series to the other. In other words, the details of the original have been altogether obliterated by the compression of the light scale, although a passable degree of contrast between the extremes is still preserved. The pith of the matter may be summed up thus:

"While photography enables one to compress a very extensive natural light scale into the much narrower limits at the command of the printer, still it performs the operation in a strictly mechanical and accurate way by modifying all contrasts, great and small, according to photometric laws, whereas human vision does *not* estimate or appreciate natural and artificial contrasts in a manner directly related to their photometric values, but is far more sensitive to modifications in the smaller contrasts than it is to modifications in the greater contrasts."

It follows that only in a few exceptional cases the compression of the whole scale within the limits of our process will yield satisfactory results. A practical difficulty will also be found in gauging in the dark room, during the process of development, the exact amount of compression necessary. The introduction of two scales into the composition, or the compression of one end of the scale, will be found more generally useful and pleasing. Reduction or intensification will effect the latter result.

The intensification of a flat negative showing too compressed a scale will show a result somewhat as if a darkish print had been made from the negative in its original state, and the lights put in with white crayon; or, when the negative happens to be dense as well as flat, relief may be obtained by clearing out the shadows with a reducing agent. If this be crisply done, the result will be as if a light print had been taken from the negative in its original state, and the shadows strengthened with black crayon. If these methods be applied locally, two scales are shown in the print; if applied generally, the effect is that of compressing one end of the scale and rendering the other more fully. For some classes of subjects these methods will yield pleasing results.

In the case of harsh negatives, where the shadow detail is already too thin, and the lights too dense, neither of these methods is quite satisfactory. In attempting to reduce the high lights which penetrate through the film to the support, it will only be by the exercise of an amount of manual dexterity not usually possessed by an amateur, and then, at the expense of a vast amount of time and patience that, we can avoid clearing away the shadow detail lying on the surface of the film when the light and shadow are intimately mingled.

When the lights and shadows are in masses, and soften into each other, the lights may be satisfactorily reduced by means of Mr. Howard Farmer's reducer (hypo and ferricyanide of potassium), applied by a sponge. A member of our Society (Mr. Beadle) is very skilful in the use of this agent, and has kindly lent me some prints from negatives, before and after reduction, which I pass round for inspection. In the prints of the chapel interior you will note the great improvement in the columns, font, and the wall, upon which the light falls so strongly. In the landscape you will note how charmingly the distance prints out from the reduced negative.

The difficulty in using this method is to avoid reducing the shadow detail adjacent to the lights, and to avoid a patchy appearance, due to unequal reduction. The same remark will apply still more strongly to the use of spirit applied with wash-leather, as some pressure has to be applied, and, if the portions to be reduced are at all large, the difficulties become very great. I have never seen an instance of a large portion of a negative reduced with spirit without patchiness appearing, generally accompanied by a smeary effect.

It is not necessary for me to give here formulæ for the many intensifiers and reducers extant, each of which has its own advantages for special purposes. A full list of these, with useful comments and explanations, will be found in the admirable paper read before our Society last year by Mr. Roland Whiting. I may, however, call your attention to one which has been referred to lately at some of the Societies. The formula as given by Mr. Teape at the London and Provincial is

Bichromate of potassium saturated solution	1 drachm.
Sulphuric acid	1 „
Water	8 ounces.

This is a stock solution to be diluted for use according to the purpose for which it is required. For instance, if it is only necessary to clear away a slight surface fog before intensification, it should be diluted to

a pale lemon tint. When dense negatives have to be reduced, a stronger solution may be used. I have found it speedy, and, when applied to the whole surface of the negative in a bath, regular in its action. The effect is visible during the operation, and as hypo, is not used, a lesser amount of washing is necessary than when that useful but troublesome chemical is employed. J. McIntosh.

(To be continued.)

THE PHOTOGRAPHIC SOCIETY'S STANDARDS.

[The following is reprinted from the Society's Journal.]

The Standards adopted by the Society in 1881 have been carefully reconsidered to see what additions or modifications were desirable.

The following statement is complete so far as the subjects it deals with are concerned:—

Lens Diaphragms.

It is recommended:—

1st. That the aperture of the standard-unit diaphragm have a diameter equal to one-fourth the equivalent focal length of the lens.

2nd. That diaphragms with smaller openings have apertures diminishing in area to the extent of one-half from the unit standard downwards.

3rd. That every diaphragm be marked with its intensity ratio, and also with the relation that the diameter of its aperture bears to the equivalent focal length of the lens, thus:—

$$1\frac{f}{4};\ 2\frac{f}{5{\cdot}6};\ 4\frac{f}{8};\ 8\frac{f}{11{\cdot}3};\ 16\frac{f}{16};\ 32\frac{f}{22{\cdot}6};\ 64\frac{f}{32};\ 128\frac{f}{45{\cdot}2};$$

$$256\frac{f}{64};\ \&c.$$

Should a lens not admit of a diaphragm with an aperture as large in diameter as one-fourth its focal length, nor exactly any one of the above-mentioned sizes, it is still recommended that all the apertures be made in uniformity with the above scale, with the exception of the largest, which should be marked with the number its area requires in relation to the unit diaphragm. In the case of a lens having a working aperture exceeding in diameter one-fourth its focal length, the diaphragms should be marked according to the sizes of their relative apertures, for example:—

$$0{\cdot}5\frac{f}{2{\cdot}8};\ 0{\cdot}25\frac{f}{2},\ \&c.$$

And diaphragms which require to be made with apertures intermediate to the standard sizes should be marked in a corresponding manner.

Lens Mounts and Fittings.

It is recommended:—

1st. That the equivalent focal length of each lens be engraved upon its mount.

2nd. That the following series of screws for photographic lens flange fittings be adopted:—

Diameter in Inches.	No. of Threads per Inch.	Core Diameter in Inches.
1	24	·9466
1·25	24	1·1966
1·5	24	1·4466
1·75	24	1·6966
2	24	1·9466
2·25	24	2·1966
2·5	24	2·4466
3	24	2·9466
3·5	12	3·3933
4	12	3·8933
5	12	4·8933
And upwards, advancing by inches.	12	

The form of thread is that known as Whitworth's Angular Thread, and is designed as follows:—Two parallel lines, at a distance apart equal to 0·96 of the screw pitch, are intersected by lines inclined to each other at 55°. One-sixth of the vertical height of the triangular spaces so obtained is rounded off both at the top and bottom. The depth of this thread is 0·64 of the screw pitch.

3rd. That every flange and adapter have a mark upon its front to indicate the position of the diaphragm slot or index of any lens when screwed home. The mark on any adapter should coincide with the mark upon any flange into which it is screwed. This mark should be placed at the point at which the thread becomes complete at the shoulder of the flange or adapter.

Camera Screws.

It is recommended:—

That all screws fitted to cameras, either for attachment to the stand, for fixing rising fronts, or for other movable parts, be either $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, or $\frac{3}{8}$ of an inch in external diameter, and in pitch of thread and other details in accordance with the generally recognised Whitworth standards for these sizes.

Our Editorial Table.

Convention Prints.

Two bromide prints received from Messrs. Morgan & Kidd, Richmond, attest at once the skill of Mr. R. L. Kidd, of the firm mentioned, as the user of the camera, and of his firm as enlargers and printers in bromide. One is a whole-plate direct group of a party of friends who, in the West Highlands, kept up the sociable character of the Convention for several days after the scientific proceedings had terminated in Edinburgh. As a memento of the happy time, containing, as it does, the portraits of more than a score of friends taken *al fresco*, it will be esteemed quite as much as for its technical excellence. The other is an enlargment ($22\frac{1}{2}\times16$) from a small negative of the Convention group taken by Mr. Kidd, the tone and brilliance of which speak much for the skill displayed in the process of enlarging.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
August 22	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 22	Gloucestershire	
,, 22	North Middlesex	Jubilee Hall, Hornsey-road.
,, 23	Great Britain (Technical)	50, Great Russell-st., Bloomsbury.
,, 24	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 25	Birmingham	Lecture Room, Midland Institute.
,, 25	Hackney	Morley Hall, Triangle, Hackney.
,, 25	Halifax Photo. Club	Mechanics' Hall, Halifax.
,, 25	Hull	Royal Institution, Hull.
,, 25	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 25	Liverpool Amateur	Crescent Chambers, 3, Lord-street.
,, 25	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 25	Oldham	The Lyceum, Union-street, Oldham.
,, 26	Cardiff	
,, 26	Holborn	
,, 26	Maidstone	"The Palace," Maidstone.
,, 26	Richmond	Greyhound Hotel, Richmond.
,, 26	Swansea	Tenby Hotel, Swansea.
,, 26	West London	Chiswick School of Art, Chiswick.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

August 11, Mr. T. E. Freshwater in the chair.

Packets of Ilford printing-out paper were distributed amongst the members.

Mr. W. D. Welford showed results of his hand-camera work during the Convention at Edinburgh; he also gave the formula for a successful bath for the Eastman chloride paper, which he had arrived at after many experiments, viz.,

Gold	4 grains.
Water	6 ounces.
Bicarbonate of soda	1½ drachms.

This would tone 108 quarter-plates, after toning was slightly, and fix in bath strength 1 to 6. Toning was very rapid.

Mr. Everitt had found the same paper tone well with a borax bath.

Mr. Dando used an old acetate bath which took a long time to tone, but any tone could be got by it.

Mr. Birt Acres made a personal statement, condemning the report of a former meeting which appeared in one of the photographic journals. Some discussion ensued, and it was generally agreed that, as to a certain portion of it, the report was inaccurate. It was decided to withdraw that portion. Mr. Birt Acres expressed himself as being satisfied.

Mr. F. A. Bridge showed a splendid enlargement, 30×20, from a quarter-plate negative of Melrose Abbey, taken during the recent Convention meeting. He presented it to the Association, and was warmly thanked.

Mr. E. W. Parfitt then opened the discussion of the evening by reading a paper on the *Development of Instantaneous Exposures.* (See page 536).

In the discussion which followed, Mr. Birt Acres stated that pyro and

ammonia used very weak, without bromide, would bring out as much as any known developer. He would use one-eighth of a grain of pyro, and an equal quantity of ammonia, to the ounce.

Mr. W. E. Debenham would use the same strength of pyro, a little more ammonia, and he found that by using a small quantity of bromide detail was not held back, but kept clearer.

Mr. WELFORD alluded to the necessity of trying everything in this age of progress, both in developers and plates. He had tried everything, and came back to pyro. Rodinal was good, but no density seemed to be obtainable, but by the after-application of hydroquinone great vigour resulted, but too much intensification. He preferred soaking the plate first in soda, then adding pyro, and recommended the Ilford formula with more soda added to start with.

Mr. Guardin used ten per cent. solutions of pyro and soda, beginning weak, and adding as required.

Mr. Sinclair would begin with a small quantity of pyro, adding by degrees, to obtain density, very little bromide.

Mr. BERT ACRES did not approve of soaking the plate first in alkali; he said more plates were spoilt in forcing than in any other way. He advised starting with weak solutions, and finishing up with stronger solutions.

Mr. Teape had been using a plate lately with which a beautiful mauve-coloured fog became evident if he used the smallest quantity of bromide.

The CHAIRMAN, in closing the discussion, said the preponderance of opinion seemed to be on the side of pyro and soda, and, on behalf of the members, thanked those gentlemen who had related their experience.

Mr. E. Bella showed a new developing dish, called the "Developan." The invention claimed that the plate, after development and rinsing with water in the same dish, could be removed from the dish in an ordinary room without danger of fog.

On discussion it was considered that the principle was not new, and that it was not safe to remove the plate from the dish in daylight even after rinsing.

Mr. BERT ACRES, alluding to the non-actinic glasses used in constructing the "Developan," remarked that orange glass was safer than a great deal of the ruby glass that was used now.

Hackney Photographic Society.—August 9, Mr. Arthur Barker in the chair.—The Hon. Secretary distributed samples of the Paget plates and Ilford P. O. paper. A discussion ensued on the latter. Mr. HENSLER said he noticed a difference in the colour, which was sometimes red and sometimes violet. He preferred the latter. Mr. Nunn differed. Mr. BECKETT said some negatives were more suitable for one colour than another. Blue paper lost the most in bath. Mr. Dean handed round a forced plate. Mr. DANDO said it was very much forced. Mr. Hudson showed some cheap sheaths made by Chipper. Mr. Nunn showed some examples of work on the Paget Phœnix plates which he had been very successful with. Mr. REYNOLDS also reported favourably of the rapid plates. Mr. POULSON asked the Chairman's opinion of the Eastman gelatino-chloride paper. The CHAIRMAN said he had used a quantity, and was much pleased with the results. Mr. W. T. Roberts, of Leytonstone, then showed his hand camera, which could be used on a stand and focussed as an ordinary camera, although being of a magazine kind. Changing could be done in daylight by carrying extra small magazine. Mr. DANDO then read a paper on *Stereoscopic Photography*. He attributed the discovery to Sir Charles Wheatley. A half-plate camera had been used by Mr. Dando for his work, and he said he had found it an advantage, as extra height was allowed. Two different pictures could be taken if desired. Another advantage in the size mentioned was that half-plates could always be obtained. He preferred the shutter just before the plate, and lenses of from five to seven-inch foci. One of the great difficulties was to get them accurately paired. He did not like the Iris diaphragm; sometimes apertures were not equal. Give plenty of exposure, and develop rather thinly, and get plenty of detail. Mr. HENSLER asked how to tell when accurately paired. Mr. DANDO said: Take lens out, pass thin piece of wood through one of the stops so that the wood is marked all round, then repeat on the other. Further discussion was postponed until next meeting.

Burnley Photographic Society.—At a meeting of the Council of this Society, held on the 10th inst., when Mr. John Butterworth, J.P., presided, an animated discussion took place in respect to the proposal to hold an annual exhibition, and a Committee was appointed to investigate the matter and report at a future meeting. Mr. Sutcliffe (the Hon. Secretary) promised to give a number of photographic annuals to the library, and a number of improvements were suggested to the Society's rooms.

Derby Photographic Society.—The fifth outdoor meeting of the season was held on Saturday last at Weston-on-Trent, a large number of members being present, and the weather being all that could be desired, a large number of plates were exposed. Mr. W. L. Mugliston was elected a member. It was decided to hold the sixth outdoor meeting at Repton on Saturday, August 27.

Richmond Camera Club.—August 12, the President in the chair.—The Hon. SECRETARY, after distributing sample packets of plates sent by the Ilford Company, and printing-out paper sent by the Britannia Company, then said that he had some difficulty in stripping gelatino-chloride prints that had been squeegeed on glass. Would xylonite slabs answer better? Mr. Cembrano (the President) had never had a failure in squeegeeing when using the Ilford paper; he recommended for this paper a combined toning and fixing bath. The xylonite slabs mentioned would be a capital substitute for the focussing screen, provided they were made sufficiently rigid and transparent. Mr. DAVIS recommended rubbing it with powdered pumice-stone to get rid of the small bright specks on matt-surface prints. In opening the discussion on *Developing Under-exposure*, Mr. DAVIS said he employed the old method of first soaking the plate in a weak solution of the accelerator, pouring this off and applying the usual developer. This system answered well when the plate was known to be under-exposed, but there was danger of spoiling the negative if the exposure happened to be a full one. Mr. Ennis preferred diluting the developer with four times its bulk of water; then, when the image was well out, he would use a fresh developer containing little bromide. Mr. Hunter would begin with a developer containing less pyro, ammonia, and bromide, and when all the possible detail was out he would strengthen it by adding plenty of pyro and more ammonia. Mr. Cembrano thought that, if the plate was really under-timed, no good could be done with it. It was in under-exposure that defects in the manufacture of the plate would become very apparent. He believed that in practice there was no real advantage of any one developing agent over another. When having a good subject, the best and safest plan would be to expose two or more plates on it. Mr. Ford had not succeeded in real cases of under-exposure, not even after developing for two hours. To gauge correctly the exposure for subjects under trees was a difficult matter. Mr. Ennis found the soda developer recommended by the President to wash well for hand-camera exposures. It was made as follows: Sulpho-pyrogallol (ten per cent.), 20 minims; Washing soda (ten per cent.), 240 minims; Bromide of potassium (ten per cent.), 2 minims. Made up with sulphite of soda (ten per cent.) to one ounce instead of plain water. Mr. Davis found it was essential to use bromide with the pyro-potash soda developer. Mr. ENNIS asked for the best way of mounting glazed gelatino-chloride prints. Mr. DAVIS said Houghton's Excelsior mountant was good. Mr. FORD added that indiarubber solution answered, but it caused the prints to fade. Mr. Ennis had had a similar experience with this mountant when mounting prints on albumenised paper.

Sheffield Photographic Society.—August 9, Mr. B. J. Taylor in the chair. Arrangements were made for an excursion to Whitby. The Secretary distributed sample packets of the Paget prize plates for members to report thereon at the next meeting. Several members also gave in their report in reference to Eastman's printing-out paper, which was considered highly satisfactory. It was also arranged to send the annual competition pictures to London for judgment.

Spen Valley Photographic Society.—August 9, Dr. Farrow, President, in the chair.—The adjudication in the monthly competition, the subject of which was *Caught*, was proceeded with, the prize being awarded to Mr. J. Burnhill for a live rat in a cage trap. This was also the time appointed to judge prints sent in to the Sutherland competition, and as it was the first competition of the kind, and in which any prize of value had been competed for, there was considerable interest taken in it. The subject was Lower Bacup Farm from a given aspect. There were ten exhibits, all of which were very creditable to the competitors, the prize being awarded to Mr. H. Jackson. A discussion then took place as to the best means of judging photographs at future exhibitions of the Society.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 14,274.—"An Improvement in Hand Cameras." Complete specification. J. HAIGH.—*Dated August 8, 1892.*

No. 14,275.—"Improvements in or relating to Photographic Cameras, and Slides or Appurtenances thereto." J. D. WILLIAMS.—*Dated August 8, 1892.*

No. 14,343.—"Improvements in Folding Stands and Supports for Photographs, Cards, and other articles to be similarly displayed." G. C. J. JELPKE.—*Dated August 9, 1892.*

No. 14,542.—"Improved Combined Substances for the Development of Photographic Images." Complete specification. J. HAUFF.—*Dated August 11, 1892.*

No. 14,559.—"Improvements in Photographic Supports and in Sensitive Emulsions therefor." J. H. P. GILLARD.—*Dated August 12, 1892.*

No. 14,572.—"Improvements in Magnesium Flash Lamps." J. C. OLIVER.—*Dated August 12, 1892.*

SPECIFICATION PUBLISHED.

1892.

No. 11,015.—"Photographs," &c. DEWE.

PATENTS COMPLETED.

IMPROVEMENTS IN AND RELATING TO CAMERA TRIPODS.

No. 10,869. LEONARD E. BENNETT, City of McHenry, County of McHenry, State of Illinois, United States of America.—*July 9, 1892.*

[THIS invention has relation to photographic cameras, and more particularly to that class thereof wherein a tripod is employed for supporting the camera, said tripod being adapted to be connected with, and disconnected from, the camera, and the primary object of the invention is to provide simple means whereby a tripod may be readily connected with, and disconnected from, the camera, said securing means being provided with locking devices, whereby the parts may be locked in position after having been connected together.]

IMPROVEMENTS IN HOLDERS FOR OBJECT GLASSES AND LENS TUBES.

No. 10,971. JAMES SWIFT, 81, Tottenham Court-road, London.—*July 16, 1892.*

THE object of this invention is to provide simple and efficient means for securing object glasses and lens tubes to microscopes, cameras, or other scientific instruments, and the invention consists in forming the lens socket with a fine thread round one half of its interior surface, and adapting to the other portion a threaded block, which is thrust forward to grip the lens tube by means of a cam action.

(In accompanying drawings several modes of carrying out this invention are shown and described.)

Improvements in Magic Lantern Slides.

No. 13,765. George Frederick Luttickе, 23, Farquhar-road, Norwood, S.E. *July* 16, 1892.

I provide a frame of anitable shape, construction, and material, having one or more grooves, holes, slots, or the like, serving as guides for suitable slides.

My invention, firstly, refers to novel means for operating in such manner as not to be perceptible on the screen-jointed figures, or objects of suitable material, or part or parts of same, such figures or objects being conveniently mounted or arranged on glass slides or suitable projections from some part or parts of the frame.

The novel means I employ for the said purpose are pins or the like conveniently fixed to the part or parts, or to cranks in connexion with part or parts which it is intended to move, such pins or the like passing through holes or alots in or being connected with a glass slide or disc in an equivalent manner, auch glass slide or disc being capable of movement in any desired direction or directions, and being preferably of such size and shape as not to show any edges when operated.

In the case of circular motion, the operating slide or disc either has a slot, small enough to be covered by the figure or object, or part of the figure or object, to be moved, or sufficient play is allowed in the depths of the grooves or aize of slots in which the opening slide or disc travels. Or both slides may be made capable of motion.

I may reverse the arrangement by suitably fixing pins or the like to a glass alide, and pass same through holes, slots, or the like, in the said figures or objects, providing, where necessary, caps, or the like, to prevent light showing through.

I may use three slides, tha centre one being stationary, and the two outside slides moving one or more figures or objects in the manner described either directly or indirectly by means of cranks or the like, working spindles or the like.

It may be useful to provide the pins or the like, which serve to operate the figures or objects, or parts thereof, with one or two plates or rings, one on each side of the operating slide or disc, so as to prevent the pin from shifting, thus obviating irregular motion in the figures or objects, or parts thereof.

I reserve to myself to arrange the said figures or objects in any other suitable way without departing from the gist of my invention.

I may also use suitable stops, rollers (to admit of easy sliding), springs, or weights in connexion with the glass slides or discs, and the operating of the same.

Secondly, in order to carry motion from one limb or part of a jointed figure or object to another, I may employ a lever conveniently pivoted to the said figure or object, and operating by means of slots, pins, or the like, conveniently fixed to the limbs or parts, or *vice versâ*.

I may also provide a plate, or plates, or the like, suitably mounted to a slide or projection from the frame in a stationary position, provided with a pin or pins, or the like, acting by means of levers, rods, or the like, on a part or parts of a figure or object revolving on a common spindle.

Thirdly, I claim the following means for producing novel illusory effects, viz., I provide a plate, table, cupboard, or the like, pivoted or otherwise conveniently fixed to a glass slide or part of the frame, such plate, or the like, coucealing a roller, or the like, in bearings worked by a suitable spring in one direction.

To such roller, or the like, I attach one end of a figure, animal, or any object made of suitable flexible material, so as to be capable of being wound round the said roller, or the like.

The free end of such figure, animal, or object is conveniently attached to a convenient part of a glass slide so that the latter may be capable, through being moved, of unrolling the said figure, animal, or object; or I may use a concealed rod or any other suitable invisible means for causing the said figure, &c., to be unwound. Or I may arrange a figure or the like in sections, hinged to one another, one end being conveniently attached to the said plate, table, or the like, the other end being moved by the means described, or by any other suitable means. Or, again, I may form the said figure or the like in sections so shaped as to be capable of sliding one within the other, and operated in the manner set forth.

Improvements in connexion with Photographs and Other Pictures, and Apparatus for Exhibiting the same.

No. 11,015. John Dewe, Hôtel Métropole, Northumberland Avenue, London, W.—*July* 23, 1892.

My invention relates, firstly, to an improved apparatus for the exhibition of photographs and other pictures, the object of which is to impart thereto a series of natural and realistic effects, capable of being changed or varied indefinitely at the will of the operator; secondly, of a manner of treating or preparing the photograph or other picture to be exhibited therein.

[So far as we can see from a perusal of the specification, this apparatus is the same as we described on page 491 as the "Photo-Chromoscope," which is placed on the market by Messrs. G. Houghton & Son.—Ed.]

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

DECLINE (AND FALL) OF PROFESSIONAL PHOTOGRAPHY.

To the Editor.

Sir,—I think the subject you have once more set a-going is well worth being looked at from many points of view, and it would be well that no offence ahould be given or taken because of different ideas on the subject. My experience goes further back than "Professional Photographer," and it teaches me that Mr. Farmer is right advocating technical, practical, and artistic teaching for a photographer. But the past history shows me that the professional is mostly drawn from the ranks of the amateurs. The present and the future is likely to continue the same; and it is no use in trying to raise any objection, for any one may enter the ranks who chooses. But all ought to consider the drift of matters connected with the hobby or trade from which we derive pleasure or profit. Let me give you one or two guesses that are pretty near the truth.

The city that I belong to has, I believe, less than one hundred professionals and operators; it has more than one thousand amateurs; it has about a score of dealers in photographic material, who give hints, lessons, &c., to any one who buys goods from them. Any person can get the catalogues, compare, and buy from the cheapest; get printing, enlarging, &c., done at as low a price as the man who waits on in his glass-house. Then, the so-called amateurs belong to every trade, and they do all that is wanted in these trades. Formerly they used to come to such a one. I could fill a sheet with the names of these trades and professions who used to bring orders to me; now there is scarcely one in a year. "Our young man does it," or "We have a staff of our own."

I don't want to grumble as long as I get just a little; but I would like something better for my family, and I would like to see the profession I have been so long connected with in as good a position as any other profession I see around. What should be done to prevent the decline of professional photography.—I am, yours, &c., Old Pro.

Glasgow, August 16, 1892.

To the Editor.

Sir,—It think that "A Professional Photographer" must have written his letter at, "to put it mildly," "high pressure." Now he has seen it in print, I am sure he will feel that there was much that "might have been expressed differently," and much more that would have better left unsaid. At first sight I must admit that the title of the article complained of, viz., "The Decay of Professional Photography," read rather ominous; but, when read without bias, it dissolved itself into what is commonly called "*hitting straight*" and not "*below the belt*," as a "Professional Photographer" has evidently read it. It is just as well to have a candid friend sometimes, or we are apt to get somewhat conceited, and I think, Mr. Editor, that I am right when I say that this was the vein in which the article was written. To class amateurs "*en masse*" as "plate-spoilers" is palpably unfair, for "photography," and "*photographers generally*," owe much to those gentlemen who have, and do, give time and talents to the working out of photographic problems, and to the discovering of new processes, &c., which are, in nine cases out of ten, cheerfully given to the photographic community, thus at once advancing the science of photography and benefiting their fellow-workers.

There are, of course, amateurs *and* amateurs; I may also add professionals *and* professionsal. Regarding the higher education of photographers, I personally sincerely hope that the time is not far distant when, in every large centre throughout the kingdom, there will be established institutes in which any one wishing to advance with the ever-flowing tide of photographic progress, may have thorough instruction in, say, the photo-mechanical processes, and the higher branches of photography generally; and when the certificates issued from such schools will be the "open sesame's" to good appointments. On whom or what the future of photography depends, time alone will show. But this I can safely predict, *i.e.*, if my brethren of the camera do not advance *with* photography, they will, as our American cousins would express it, "just git left!'—I am, yours, &c., F. J. A.

CENTRAL STOPS.

To the Editor.

Sir,—In the leading article upon "Equalising the Illumination of Negatives" in your last issue, you mention a suggestion, made in 1863, that benefit would be derived from an opaque central stop, suitably placed with respect to a photographic lens. This reminded me of a much earlier instance, where the same device, though under slightly different circumstances, came under my notice, which, with one or two attendant incidents, may interest, and perhaps surprise, some of our younger photographers.

Nearly fifty years ago I spoke to the late able optician Mr. Ross (the first of that name) about making for me a rapid portrait lens. It was, of course, one of the first made, and involved a little consideration, especially as, being young at the time, I was the more concerned about the cost. Ultimately, Mr. Ross told me that, if I would waive objection to some small veins in the flint component of the lenses, he could supply the objective much more cheaply; and that, if I never wanted to magnify the image more than three or four diameters, the veins would be of no consequence whatever. On this understanding, the portrait lens was made. The equivalent focus is somewhere about 6 inches, and the front lens is 2⅜ inches in clear diameter. The largest stop is 1½ inches; and, if a smaller one were desired, it would be needful to unscrew the back lens, and then to *screw* the smaller stop into its place. A Daguerreotype, taken by me soon after the lens came into my hands, proves that *over a small area* (it was intended chiefly for portraits on plates 2½ × 2 inches) the apparent sharpness of the picture could not be exceeded by any

modern lens, and the price charged to me was, I believe, only 3*l.* 10*s.* (I am sure that it was not more than 4*l.* 10*s.*), so that the optician dealt well with me; but for a piece of finely greyed glass, 9 × 7 inches, supplied at the same time, unmounted, for a focussing screen, I was charged 15*s.* It was just such glass as is generally used now for the purpose in good cameras. When copying an engraving, I was often troubled with a "flare-spot" in the middle of the picture, a defect which troubled others also. Mr. Ross told me that some one was proposing to take out a patent for an opaque central stop to obviate this defect, but that Mr. Fox Talbot (the inventor of the calotype process), for whom also, I think, he made photographic objectives, had instructed him to enter a *caveat* against it.—I am, yours, &c.,

CHARLES J. TAYLOR.

Banstead, Surrey, August 15, 1892.

LOSS OF DENSITY IN FIXING.

To the EDITOR.

SIR,—Your very interesting No. (1684), BRITISH JOURNAL OF PHOTOGRAPHY, came to hand, and I consider the group quite a success. On p. 527, the letter headed "Loss of density in Fixing," should read, "Difference of Intensity on a Wet and Dry Plate" I think.

I am sorry, exceedingly sorry indeed, not to be able to oblige Mr. A. C. Manners in his contradiction to my assertion (that a negative is more intense when dry than while wet) and cast my experience of some twelve years, and development of thousands of negatives, to the winds, simply because Mr. A. C. M. has made a trial. I beg to differ, even if he has his opinion supported by his wife and several friends (among them two amateur photographers), to which he may have added his sisters, cousins, and aunts.

I would further say that I have not advanced any theory; I only submitted a fact and tried to explain it plainly. Since then I have not made any unnecessary trials, as I know the fact since years, but have asked several photographers, and they expressed the same opinion as I did.

If Mr. A. C. M. likes to make trials, let him try the following one more conclusive:—Take a stereo negative, and, when developed, print one half of it when dry and the other half while wet, and then see the results in the details particularly. No reproduction of a drawing, but a view with details and shadows.

As to my eyes, they are all right; being able to judge of the *less* or *more* intensity of a negative, there is no reason why I should not be able to judge the *more* or *less*. It may, however, depend upon whose opinion I share as to the value of my eyesight. Hoping you will kindly admit this answer to Mr. A. C. Manners, I am, yours &c.,

A. LEVY.

Asnières, Paris, August 15th, 1892.

NEW DEVELOPERS—A SUGGESTION.

To the EDITOR.

SIR,—I observe from the JOURNAL of last week that another new developer has been placed in the hands of photographers. It appears to me that the experimentalists too closely confine their endeavours to the provision of new developing substances which work cleanly and rapidly at a high degree of dilution with some real or fancied superiority in the control of detail, without, however, enlightening us in regard to the extent, if any, that the new claimants for favour are superior to older reagents in the matter of enabling us to shorten the exposure.

If I remember aright, when hydroquinone was introduced a dozen years ago, it was claimed that, in combination with ammonium carbonate, it enabled one to reduce the normal exposure by one-half. Was this claim ever substantiated? For studio work, this power of shortening the exposure by the use of a particular developer would at times be most useful to possess.

My present object is to inquire whether any comparative experiments have been made with the various developers in actual use with a view to determining which has the advantage of allowing of the shortest exposure, and, if no such experiments have been made, to suggest they be undertaken by some competent investigator. If any developer has that advantage, the information might be of some practical use, whereas at present I submit that the rivalry of new developers is often simply a case of tweedledee *versus* tweedledum; that is, their advantages are more fanciful than real.—I am, yours, &c.,

W. A. WRIGHT.

Ipswich, August 16, 1892.

BORAX *VERSUS* BLISTERS.

To the EDITOR.

SIR,—I think it but right that I should inform you, and also my fellow-photographers, how I prevent the formation of blisters on albumen prints.

Reading up a certain process one day, I noticed that borax was used in the fixing bath, and I thought, Why not use it for prints on albumenised paper? I tried it, and ever since then I have never seen another blister.

My mode of working is as follows:—After toning, the prints are placed in salt water to prevent further toning and then washed under the tap. In the meanwhile a cupful of water is set over the spirit lamp, and when warm enough I dissolve in it an egg-cupful of powdered borax (say, little more than an ounce). This I add to the fixing bath (one pound of hypo to a gallon of water) and stir; then fix for 20 minutes, moving the prints about all the while. Try it.—I am, yours, &c.,

JAMES GRIBBLE.

Art Studio, Pearl, Cape Colony, July 27, 1892.

PERMANENCY OF GELATINO-CHLORIDE PRINTS.

To the EDITOR.

SIR,—At the risk of flattering your correspondent, Mr. H. G. M. Conybeare, I should say that the fact of his gelatino-chloride print having remained unchanged after nine months' exposure to light is rather a tribute to his own careful system of working than to any intrinsic change-resisting quality of the paper. Much severer tests have been applied to albumen paper prints from which they have emerged successfully, and yet nowadays poor old albumen is in receipt of almost universal condemnation.

I like gelatino-chloride prints, but certainly not better than albumen prints, save in certain details of manipulation, and I fail to see where the claimed superiority as regards the properties of the image lies. Would some workers of gelatino-chloride kindly tell me? I don't wish to be told anything about the surface effects, i.e., the enamellike gloss, or the "mattiness." Does gelatino-chloride, for instance, give finer detail or truer gradations than albumen? Is it superior to the latter in printing from thin or dense negatives? Above all, are regularity and uniformity of tone more easily obtainable? My experience negatives those points, but I should be glad to have that of others.—I am, yours, &c.,

Balham, August 14, 1892. R. WILSON.

RESTORING SPENT DEVELOPING SOLUTIONS.

To the EDITOR.

SIR,—Your interesting leader on the restoration of spent ferrous-oxalate developing solutions induces me to ask you or any of your readers whether a method is available for reconverting into usable condition an exhausted pyro solution. Chemically considered, it does not appear to me a difficult matter, while from an economical standpoint a simple and efficient plan of procedure might be appreciated by many workers.—I am, yours, &c.,

Faversham, Aug. 12, 1892. PYROPHIL.

[We are not aware that any such method has been found of practical utility—indeed, looking at the somewhat complex interactions which take place in development, we are doubtful if any "restoration" process could be successfully applied without considerable difficulty.—ED.]

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Will exchange diamond ring, cost 8*l.*, for lens by good maker.—Address, E. SPILLER 107, Lake-road, Portsmouth.

Will exchange fine-toned seven-string banjo in case for half-plate camera or dry plates, &c., value.—Address, H. FLETT, 38, King's-road, St. Leonards.

I will exchange good half-plate portrait lens for whole-plate wide-angle rectilinear.—Address, JOSEPH SMITH, Strawberry Bank, Blackburn.

Five quarter-plate Tylar's double dark slide, with focussing screen, for three 5×4.—Address, J. R. CARDWELL, 79, Crampton-road, Penge, S.E.

Wanted, whole-plate camera and slides, rectilinear lens and stand; will exchange a Beeston Humber Safety, solid, splendid condition.—Address, P., 3, Hinckley-road, Leicester.

Will give two beautiful backgrounds, interior and exterior, also wall background and box for same, almost new, and a little cash, in exchange for Dallmeyer's 2c.—Address, WOMAWELL, Queen's-road, Blackburn.

Wanted whole-plate rapid rectilinear lens (10×8), group ditto, quarter-plate rapid rectilinear, quarter-plate hand camera; will exchange rock accessory, pedestal, posing chair, grass mat, head-rest, Rembrandt vignette background (flatted oil), interior ditto (distemper).—Address, BAILEY, Gordon-terrace, Clovelly-road, Bideford.

Ross No. 2 carte lens, half-plate rapid rectilinear 12×10 bellows camera, two double backs, half-plate ditto, quite new, three double backs and interior background lighted from left; wanted background lighted from right, head and body rest. Studio camera stand and 4-back posing chair.—Address, MANAGER, London Photographic Company, 21 Station-street, Sittingbourne.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & CO.," *2, York-street, Covent Garden, London.*

R. H.—Not so far as we are aware of. Why not write direct to the author of the work mentioned?

ALPHA.—Fuse the nitrate of silver at a high temperature, then dissolve in water, filter, and crystallise.

SIGMA.—A developed gelatine negative may be "fixed in gaslight" without setting up any injurious effects on the resulting *eliché*.

ONE IN DOUBT.—A matt surface may be imparted to gelatino-chloride prints by squeegeeing them on to ground glass and stripping before quite dry.

P. B. W.—If the albumenised paper has been kept long in a damp place, the chances are that it has deteriorated, and that would account for the spots.

B. BAILEY. If the negatives be spotted with ordinary water colours, avoiding gamboge, which is soluble in spirit, the spotting will not be disturbed by the varnishing.

W. RIX.—There is absolutely no advantage in the use of a yellow screen with ordinary plates. It materially lengthens the exposure, but in no way improves the quality of the negatives.

DEVON.—If the apprentice's indentures are not stamped, they are of no value. The youth can leave at any time he chooses. On the other hand, his master can discharge him the same as any other servant.

S. T. F.—The quickest way to dry a gelatine negative is to, after draining it, immerse it for a few minutes in strong methylated spirit. It can then be dried at a gentle heat, without fear of the gelatine running.

QUIS.—1 and 2. Take the solids by weight and the liquids by measure, unless the formula directs otherwise. 3. Hardwich's *Photographic Chemistry*, Churchill & Co. 4. *Opties of Photography*, Whittaker & Co.

N. B.—If the sandarac is good, it should make a transparent solution when dissolved in alcohol. There are always some insoluble particles, owing to mechanical impurities adherining to the resin, but they are readily filtered out.

J. LINKLATER.—We are quite unable to give you any information relative to the qualities of the plates named, not having personally tried them. You should apply to the makers. "Cricklewood, London," will be a sufficient address.

H. BOWERS.—Evidently the magnesium was flashed at too great a distance from the sitter. With the quantity of powder burnt, the plate used, and a lens with an aperture of *f*-6, the negative should be fully, if not, indeed, over-exposed.

IGNORAMUS asks: "Can any one register and use for a trade mark a photograph, the negatives of same still being in the possession of the photographer?"—No, providing the copyright in the photograph has been registered by the photographer.

ALBERT FRASER (Chichester).—The double chloride of silver and mercury is unalterable in light, so that in improving the tone of a silver print with a solution of mercuric chloride, as suggested by Mr. Drage, you need not apprehend loss of permanency.

WOOD NAPHTHA.—The new (mineralised) methylated spirit has been employed in the preparation of collodion emulsion with, on the whole, such success as to seriously discount the original belief that it would be useless for that purpose. Heuce our advice to you is to try it.

ASSISTANT.—An attempt was made, a year or two back, to form a trades union among photographers' assistants, but we believe it came to nothing. The Photographers' Benevolent Association is in no way Associated with trades unionism. It is purely a benevolent institution.

M. J. E.—Full details of photo-zincography will be found in the back volumes of the JOURNAL. The process is also described in Hardwich's *Photographic Chemistry*, last edition, and in Burton's work on *Photographic Printing Processes*. There is no separate work specially devoted to the subject.

A. W. WILLIAMS.—The so-called "invisible backgrounds" in Daguerreotypes were obtained by having a background of blanket-like material, placed somewhat out of focus and kept in motion during the exposure. But the same effect cannot be produced on any plate other than a daguerreotype one.

HALOGEN.—In all probability the yellow appearance of the film is due to the presence of silver iodide in the emulsion, but it is better to ascertain the fact by experiment before venturing a positive opinion, inasmuch as bromide of silver alone sometimes assumes a yellow colour not distinguishable from that of silver iodide.

A. S. K.—Carbon tissue is not sensitive enough for producing enlargements direct by ordinary daylight. It may, however, be used for direct enlarging if the solar camera be employed. Carbon enlargements are printed from enlarged negatives; hence they cannot be produced for anything like the price of bromide ones.

OPERATOR inquires: "Will you kindly give me a formula for toning bath that will produce a nice reddish tone, much similar to the red chalk carbon process; if you will assist me in this, I shall feel grateful."—The acetate of soda bath produces good reddish tones, but no toning bath will give tones on albumen paper at all resembling red chalk "carbon" pictures.

A. WEST (Hartlepool).—Sulphite of soda will not only prevent pyrogallol in solution from becoming oxidised, but if added to a plain solution, discoloured to the depth of a sherry tint, will materially decolourise it. In so doing it is probable that it restores the partly lost developable properties of the pyrogallol by deoxidation. The hint may be of practical service to you.

W. WOODS.—If the lens will not take a half-plate negative, sharp to th corners, it is not suitable for enlarging from that size, though it will answer very well for smaller sizes. A lens for enlarging purposes should be capable of taking a perfect negative of the size of the one to be enlarged. The most successful workers generally use one equal to taking a picture one or two sizes larger.

R. H. DAY says he had the misfortune to spill some silver solution on a damask tablecloth, which, he says, "produced unpleasant remarks from my better half every time the cloth is used." He asks if there is any means of getting the stains out?—Make a strong solution of iodide of potassium in water; in this dissolve iodine enough to make it of a dark port wine colour. Treat the stains with this, and afterwards with a solution of cyanide of potassium.

SCOTIA says: "We retouch our negatives before varnishing, and are troubled by the retouching coming off when they are subsequently varnished. As we often send three, four, and five proofs, it is not necessary to varnish those we receive no orders for. I should be glad if you could inform me of any means to modify, if not entirely stop, the removal of the retouching."—Some retouching mediums are more affected by the varnish than others, therefore one should be selected that is least influenced by varnish. The trouble may, however, be mitigated by not making the negative hotter than is really necessary in varnishing.

G. B., JUN., writes: "I have had a difficulty lately, and thought that you might be able to help me towards solving it. It is in the varnishing of wet plates. They are first class immediately before varnishing, but as soon as the varnish touches them they vanish, and almost leave clear glass. I intensify them with mercury. Has this any effect on it? I use Mawson's collodion; also Mawson's varnish."—This is not an exceptional experience. In nearly all cases in which negatives are intensified by mercury, they are rendered more transparent by an alcoholic varnish. It may be well to try the effect of giving them a coating of gum water or albumen, well beaten up, previous to varnishing.

PRINTER writes as follows: "We are often troubled with unsharp prints through the paper not being in close contact with the negatives in places. The springs of the frames are strong, and the paper seems flat enough when first put on the negative, but it seems to cockle afterwards. If the prints, partially printed, are left in the frames in the printing room all night, they are almost always spoilt from want of contact. Can you give any opinion as to the cause?"—The trouble, no doubt, is due to damp causing the paper to expand. If dry paper be placed upon the negative, and then backed with pads that contain moisture, it will be absorbed, and consequently the paper will become distended and buckle. Printing rooms are generally more or less damp in wet weather, and frames and pads left in them all night get moist. See that the pads and backs of the frames are equally as dry as the paper and the trouble will cease.

TYNESIDE CAMERA CLUB.—August 22, General Meeting. 27, Excursion. 29, Council Meeting for winter session programme.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—August 23, Technical Meeting. Subject for discussion, *Portraiture other than in the Studio.*

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—August 25, Members' Open Night. September 1, *Control of Gradation*, W. E. Debenham.

PHOTOGRAPHIC CLUB.—August 24, *Kallitype*. 31, *Optical Glass*. Saturday outing, August 20, Twickenham and Richmond. Meet at Twickenham Station at three to quarter past three.

NEW COLLOTYPE WORKS.—From a circular received from Messrs. Morgan & Kidd, Kew Foot-road, Richmond, we find that they have erected a splendid building, and fitted it up with the most modern machinery for collotype printing.

GREAT CELLULOID EXPLOSION.—A serious explosion of celluloid, lacquer and varnish, and cognate substances took place on the 28th ult. on the premises of the Frederick Crane Chemical Company, Springfield, New Jersey, U.S.A. Not a house within a radius of a mile and a half escaped injury, several buildings being totally destroyed. The presumption is that there were about 500 pounds of gun-cotton in the drying-room; and, owing to the heat of the weather, special precautions had been taken to prevent its heating.

*** *We this week give the key to the Convention Group which we issued with last number. Where blanks occur, or in the event of names being mis-spelt, will any friends able to supply or correct these kindly apprise the Editor and oblige?*

CONTENTS.

THE BRITISH
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No. 1686. Vol. XXXIX.—AUGUST 26, 1892.

INDOOR PORTRAITURE.

This subject is necessarily one of interest to all except professional portraitists, who are the possessors of studios expressly fitted for portraiture. It has formed the theme of discussion at two metropolitan Societies quite lately, and on another page will be found a report of the discussion on the subject which took place on Tuesday at the Technical Meeting of the Photographic Society of Great Britain, and in course of which various phases of non-studio portraiture will be found to have been discussed.

That special phase to which we desire to direct attention at present is one which many years ago, and occasionally since, we have practised with unvarying success. It is a system by which any one who has access to an ordinary bedroom or other window may be enabled to produce a bust portrait which, in respect of roundness, chiaroscuro, and other necessary properties, shall not be in any way inferior to one taken in the most elaborately appointed studio. The window referred to should, by preference, have a northern aspect, although we have found others to serve the purpose quite well so long as the direct rays of the sun do not find admission.

The reader is now supposed to seat himself in front of such a window, and to scan himself in a mirror placed on a narrow table as near to the window as possible. Let him study the effect of the lighting on his face, and then do the same after shifting his chair a few inches to the right or left, noting the different effects produced. In some positions the most perfect modelling will be perceived, and he will conclude that, if a portrait of himself could be obtained just as he is sitting, it would indeed be perfect.

Having established the fact that perfect lighting can be effected, the subject to be photographed now takes the chair, and a suitable background is placed behind him (or her). Its dimensions, colour, and distance from the sitter must be left to the taste of the photographer. The camera is now introduced, and is placed at one side of the subject and facing the mirror in the window, which must now be turned so much to one side as to permit of *its* seeing the reflected image of the sitter, who will no longer see himself, but the camera.

In the duration of the exposure to be given the operator must be guided by experience; but we venture to say that, as he will fail to recognise the volume of light falling on the sitter, and the very small amount of loss by the reflection in the mirror, he will at first err in the direction of over-exposure. In the last trial we made we found that an exposure of three seconds, the sky being overcast with bright clouds, gave a negative which was fully exposed, although the lens, a cemented doublet, was not working at its full aperture. Of course, as every one knows, the rapidity of exposure is determined by the quantity of light by which the sitter is illuminated, and this may be largely influenced by the distance between the subject and the window. We may here observe that the window at which most of our experiments were made measures seven feet in height by three feet eight inches in width, and, if one who seats himself near to and facing even such a small window will measure the vertical and horizontal angle of the light admitted, he will find that it is in excess of that commonly admitted in photographic studios. As we have said on a previous occasion, it is not the size of the studio or its window that determines the force of the illumination, but the angular relation of the window to the sitter. Hence a window which is twelve feet square may in reality admit a far less degree of light, so far as a special sitter is concerned, than one of six feet square, the area of which is only one-fourth that of the previous size. So from this it will be seen that, if a person sits sufficiently near to a window, much more light will fall upon him than would be the case in many studios, and for the same reason it will be seen that, in proportion as he removes his seat from the window, the light diminishes according to the square of the distance.

But what of the double image, the reversion of the image, and the absorption of light produced by a mirror?

Regarding the first—the double image—while there is really a reflection from the front or outer surface of the glass, it is so infinitesimally small as compared with that from the silvered surface behind as to be altogether unworthy of notice. If the glass were presented to the sitter at an angle of great obliquity, then would the front surface of the glass act as a reflector, and a double image would be produced; but we appeal to any one who views himself in a mirror whether such duplication is at all observable. The image from the back or metallised surface is so brilliant as altogether to eclipse the exceedingly feeble one from the front, and as in ordinary practice it cannot be seen, although theoretically there, it may safely be dismissed as an objection.

The image is certainly reversed. This is not a very serious matter in the case of single portraits, while it is a positive advantage if the portrait is to be printed by the carbon or collotype process. But, if instead of a glass plate a celluloid film be employed as the supporter of the sensitive surface, then is it altogether immaterial, seeing that a celluloid film may be printed through, producing either a reversed or non-reversed print at will, and these with practically equal sharpness.

As the light has to pass twice through the thickness of the glass of which the mirror is composed, there will of necessity be some loss by absorption. But what of that? It is only when the mirror is constructed of thick plate glass of a yellow or

brownish yellow colour that influences hostile to the rapidity of exposure may be anticipated, and even then the exposure will only be required to be lengthened to, say, ten or fifteen per cent., an inappreciable quantity when the totality of exposure is under five or six seconds. But with the mirror, with which our experiments have mainly been conducted, and which is known as French plate, the absorption is so little, owing, perhaps, to the thinness and colourless nature of the glass, that we scarcely ever think of estimating it as a controlling factor in the exposure at all.

Without going into further details, we believe we have said sufficient to shew that the system of indoor portrait photography here described is worthy of the attention of those who aspire to this class of work without having other means of carrying their aspirations into effect.

MOUNTING STEREOSCOPIC PICTURES.

On perusing two papers on the stereoscope, respectively by Messrs. A. L. Henderson and W. P. Dando, which appear in the current issue of this Journal, we observe that both stop short at a point which is replete with interest, and one which we make bold to say exercised no mean power in causing binocular photography to fall into the desuetude from which it is only now being slowly rescued. The point to which we allude is the mounting of the pictures.

We fortunately possess a large number of stereoscopic views, the production of which represents nearly all the best-known makers in the world, and, on taking up a few dozen at random, we cannot fail being struck by the great carelessness and utter want of system that prevail in their trimming and mounting.

For facilitating the coalescence of binocular prints in a stereoscope, it has often been shown by ourselves and other writers that the distance apart of similar objects in the stereoscopic pair of pictures should be, by preference, two and three-quarter inches, while never exceeding three inches. But in many slides this distance is exceeded, and, upon accurate measurement, we find it to be in some instances three and three-quarter inches, a considerable number ranging from three and a quarter to three and a half inches apart. The consequence of this is, that many of those slides cannot be brought into coalescence at all, or, if so, it is only at the expense of some pain to the eyes. This is altogether avoided by confining the amount of separation to the measurement we have given. While the width apart of the pictures is of such vital importance, it is not so with regard to their height, as in this case the eyes may have full play in a vertical direction.

Where carelessness is very often apparent, even when the correct distance between the pair of pictures is preserved, is in the manner in which the sides of the prints are trimmed. It is first of all imperative that the base line be identical in both halves. This is easily ensured by selecting a point in the foreground of one print, and laying a straight edge down so as to cut this and the corresponding point in the companion print, and then trimming them to that line.

Next take one of the halves of the binocular pair, say that which is to be mounted at the left-hand end of the card, and cut it so as to include so much of the subject as is required to make a pictorial whole. Where skill is required is in the trimming of the second element of the pair. Trim first the right-hand side of the print, taking care that any object at that margin of the foreground shall be shown slightly fuller than the corresponding object in the previously trimmed half, that is, that rather less of it shall be shown in the right picture than in the left, and then cut them both of the same width. It follows that there will be *slightly* less subject (measured from foreground—this is essential) visible at the extreme ends of both prints than where they join in the centre of the mount. The effect produced by this is that the subject appears in the stereoscope as if projected beyond the mount, and this is the way in which all such pictures should be mounted. Out of fifty pictures exhibited at a photographic meeting lately, including works by all the leading professional makers of Europe and America, it is worthy of notice that none but those of Mr. W. I. Chadwick were correctly mounted. This speaks volumes for his care and attention to details.

PHOTOGRAVURE AND AQUATINT ENGRAVING.

In an article a fortnight back we treated on one method of producing photogravures by which the intaglio plate is formed by the deposition of copper by electrotyping on a grained gelatine relief. Now, although that method is extensively employed by some firms, it has, to a considerable extent, been superseded by another, which is known as the etching process. The advantage of the latter over the electrotyping system is mainly that of expedition. To produce a plate of sufficient thickness for printing from, by electrotyping, will occupy something like a fortnight; whereas, by the etching process, it is a question of minutes rather than of days. It is to this system of working and its principles that we shall here direct attention.

The modern method of photo-etching is founded upon that first invented by Fox Talbot now some five-and-thirty years ago, and by which that gentleman produced results that would not suffer in comparison with many of the untouched ones of the present day; indeed, the process differs by little from the original one. Talbot's method consisted in coating a copper plate with a thin film of bichromated gelatine, then exposing it to light behind a transparent positive. When the image was sufficiently printed, the plate was treated with a solution of bichloride of platinum, or with one of perchloride of iron. The solution penetrated the film in proportion as it had been protected from the light's action, and attacked the metal, and so etched or "bit" into it. The present system is conducted somewhat differently, inasmuch as, instead of etching through the film just as it leaves the printing frame, the unacted-upon-by-light portions are dissolved away by warm water, so that there is no gelatine at all on the deepest shadows.

If we take a carbon print, made from a transparency, and develop it on a copper plate, and, after drying it, immerse it in a solution of perchloride of iron, the copper will commence to dissolve at once where it is not protected by the gelatine, and gradually in the other portions as the solution permeates the different thicknesses of the film of which the image is formed. Hence, in the end, we obtain an intaglio image in the copper with perfect gradation from the deepest shadows to the highest lights. But, if a plate so produced be printed from, as an engraved plate would be, only an exceedingly poor print would be obtained, because, notwithstanding that the image is in intaglio, it has no ink-holding properties. Indeed, it would be very similar to an electrotype from a plain gelatine relief, as referred to in the previous article. It is necessary that the image not only is in intaglio, but that it also possesses a grain or "tooth," otherwise it will not retain the ink when applied, as in copper-plate printing.

Photographic etching, as carried out in practice, is very

analogous to aquatint engraving, except that the varying thicknesses of gelatine of which the image is composed take the place of the different stoppings off and re-etching processes.

The process of aquatint engraving, it may be explained to those who are not familiar with it, is this: On a copper plate is laid what is called an aquatint ground. There are two methods of doing this. One is to flow over the plate a solution of common resin, sometimes with the addition of Burgundy pitch or other resins, in alcohol, in the same manner as collodion is applied to glass. As the film dries it "chills," as matt varnish does. If this coating be examined with a magnifier, it will be found to contain numberless minute cracks or fissures which expose the bare metal. The more general way, however, is to dust the plate over with a powdered resin or bitumen, and then heat it until the material is just melted, and thus becomes fixed to the metal as fine particles. This latter, by the way, is the plan generally adopted by photo-etchers. If a plate thus prepared were put into a mordant in which the metal is soluble, it would be dissolved or etched out in the minute spaces where it is not protected by the resinous matter. Of course, if such a plate were inked up and printed from, it would yield a perfectly black impression, just as would the mezzotint-grounded plate referred to a fortnight ago. When a perfect ground has been laid, the engraver paints in the high lights with an acid-resisting varnish, and then treats the plate with dilute nitric acid for a short time. Then, after washing and drying it, the delicate portions are painted in and the plate etched again. These operations are repeated again and again until the deepest shadows are reached. These, of course, will have been exposed to each of the many etchings.

Now, it will be seen that photo-etching, except that it is worked, so to speak, automatically, is analogous to aquatint engraving. An aquatint ground is laid, either with powdered bitumen or resin, on a copper plate as just described. In Talbot's original process the ground was laid on the surface of the gelatine film after the image was printed. A carbon print is then developed upon it. When dry, and after its margins and back have been protected with an impervious varnish, the plate is immersed in a solution of perchloride of iron. Nitric acid, as used by engravers, could not be used, as it would act on the gelatine. The perchloride at once begins to etch the deepest shadows. It then slowly penetrates the gelatine in the thinner parts, and etches there. Afterwards it reaches the half-tones, and finally the high lights, when the action is stopped.

From the above it will be seen how very similar is photo-etching allied to aquatint engraving. The highest lights which the aquatinter forms with his first application of varnish is represented in the photograph by the greatest thickness of gelatine. The middle tints, which may, perhaps, be reached by the fifth or sixth stopping out, is in the photograph represented by a medium thickness of gelatine, and so on. Aquatint engraving is a somewhat tedious operation, owing to the many stoppings out and re-etchings. But, as we have said, with photo-etching the work proceeds almost automatically, by reason of the varying thickness of the gelatine film of which the image is composed.

In the foregoing remarks, *a* solution of perchloride of iron has been spoken of; it may be mentioned, however, that, in practice, solutions of several strengths are employed for the same plate. A strong one is used first for the deepest shadows, a less concentrated one for the lighter ones, and more dilute ones for the delicate tints. It may also be explained that a strong solution of the perchloride of iron will take a long time to permeate even the thinnest portions of the gelatine, while a dilute one will penetrate through the thickest parts, and attack the metal rapidly. A concentrated solution of perchloride of iron has a hardening or tanning action on the gelatine, while a weak one has not.

Artistic Photographs.—Our contemporary, *La Nature*, reproduced the other day a set of photographs exquisitely graceful and artistic by means of a wood engraving from phototype prints in the *Journal* of the Photo-Club of Paris. The editor very justly and pertinently remarks that formerly it was a reproach to photography that it was in no sense artistic, that it presented to the painter nothing but a purely chemical process and mechanical reproductions—a reproach that was just in a certain measure when referring to the work of unskilful operators devoid of taste. But, when the worker possessed artistic sentiment, he produced works of art that would do credit to the most careful painter. The illustration, four studies of a child blowing bubbles, by M. Boissonas, of Geneva, a name well known where art and photography are allied, bears out in every way this thesis.

Decolourising Shellac Varnish.—For more years than we can remember, the plan of shaking the varnish with animal charcoal and placing in the sun has found a place in almost every receipt-book and text-book on the subject. We have tried it more than once with just as much decolourisation as would be produced by reading aloud to it Campbell's *Pleasures of Hope*. No, the attempt is hopeless, and we recommend our readers to have none of it. If they require a pale (not a colourless) varnish, let them use bleached shellac. But there is no reason why for varnishing negatives a pale varnish should be used. Ordinary unbleached shellac gives a tougher and stronger body, and, as to the colour it imparts to the negative, it is far less than the normal excess beyond what is unavoidable that characterises ninety per cent. of the average dry-plate negatives.

Shellac Varnish.—In making this indispensable requisite for the photographer an amount of waste takes place that is almost sad to contemplate. The solution is made, the vessel is allowed to stand, say, for a month, without agitation, and the varnish is decanted. But how much varnish? Very little more than one-half of the whole quantity. The rest is hopeless mud, from which but a comparatively small proportion of clear solution can be removed by filtration. The drysalter can use this up for "French polish;" but what resource has the photographer but to throw it away, with a feeling of regret at the absolute waste? He can utilise a portion by thickening it with a further addition of shellac for a strong varnish for woodwork; but he is not likely to use much in this way as the waste continues. All kinds of methods for depositing this insoluble matter have been proposed—the addition of all sorts of insoluble powders, to cause it to settle, for example—but with little practical advantage so far. A suggestion recently made to us seems very feasible, and if any of our readers in possession of the required apparatus can, and will, attempt it, we should be pleased to hear the result. The suggestion is that the varnish should be cleaned by placing in a centrifugal separator.

Methylated Spirit.—Last week we concluded our *résumé* of the method of procedure to be followed in obtaining the old kind of spirit by the warning, *inter alia*, that the purchaser should, "above all, take care of all papers in connexion with its purchase and receipt." We may particularise still further with advantage upon this last item. We have explained how, to order the spirit from an authorised methylator, it is necessary to fill in a form and counterfoil and send the former on to the maker. The latter also has his share of formality to go through. He has to obtain a "permit" to deliver this duty-free spirit, and it is in the form of a small slip of paper. This slip, or "permit," is always attached to the vessel in which the spirit is sent out (usually tied to the label), and should be preserved so as to be open for the surveyor's inspection when he pays one of his periodical visits. A special warning circular is usually sent to holders of a permission to purchase oil-free spirit, and contains the following

clause: "The purchasing of spirits of wine from others than licensed dealers and retailers, or the receiving thereof unaccompanied by the permits and certificates required by law, subjects chemists and druggists to heavy penalties, and renders them liable to detection from various sources." Our readers should substitute the word "photographers" for "chemists and druggists." *Verbum sat sapienti.*

Cui Bono?—It has been suggested to us that, as an answer to those who preach "practice before theory," and are always putting the trite question that heads this paragraph when purely experimental work is in question, we should give some of the concluding sentences of the opening address of the President of the Chemical Section of the British Association, a portion of his remarks referring to catalysis having already been quoted by us. Premising that the coal-tar dyes, mauve and magenta, were the outcome of purely theoretical investigations, and that their manufacture in the early days of the industry brought, by repute, a fortune of over a quarter of a million of money to the fortunate workers of the patent taken out for the production of these dyes, we give Professor McLeod's own words (photographers might read "emulsion plates" for "mauve and magenta," and the lesson would be complete):—"Need I say more? The moral of mauve and magenta is transparent enough; I read it in your eyes. We understand each other. Whenever in future one of your chemical friends, full of enthusiasm, exhibits and explains to you his newly discovered compounds, you will not cool his noble ardour by asking him that most terrible of all questions, 'What is its use? Will your compound bleach or dye? Will it shave? May it be used as a substitute for leather?' Let him quietly go on with his work. The dye, the lather, the leather will make their appearance in due time. Let him, I repeat, perform his task. Let him indulge in the pursuit of truth—of truth pure and simple—of truth, not for the sake of mauve, not for the sake of magenta; let him pursue truth for the sake of truth."

CONVENTION JOTTINGS.—V.

A Run through Some of the Scotch Studios.

Alex Ayton, Jun. (Brunstfield-place, Edinburgh).

Mr. Alex Ayton's studio at Brunstfield-place, Edinbugh, is a complete establishment, which proves how, with method and management, a large trade can be done in a limited space, for the space in this case is limited when the large amount of business done in it is taken into consideration.

Having acquired all the open ground available on the site that, as a favoured position, has proved such a remarkable success, Mr. Ayton can get no farther, and so has to content himself with the extent of premises at his command.

One advantage he possesses, and that is the whole of the business premises and studio being on the ground floor, which, in a city like Edinburgh, counts for a great deal, so many people having an aversion to stairs.

The frontage of Mr. Ayton's place is all that could be desired, possessing as it does two large windows to the street, where the show of work is prominent and pleasing, and, as a means of advertising, invaluable. The doorway, artistically fitted with stained glass, is situated between the windows forming the entrance to the showroom, which, on entering, we find crowded with examples of the various kinds of photographic work produced in the establishment. Amongst these specimens the group photographs stand out prominently, Mr. Ayton having made a specialty of this class of work, and, with his constant practice, has attained considerable perfection, both in technical excellence and general artistic arrangement, which is quite marked.

The Convention Group being one of many in a collection where groups are on view of many hundreds on one plate, all seemingly steady, artistically arranged, and fully exposed.

Platinotype forms a considerable part of Mr. Ayton's business. It will be remembered that at the Edinburgh International Photographic Exhibition a medal was awarded to him for this class of work, and his exhibits of large platinum work, shown at the Glasgow International Photographic Exhibition, gained considerable praise and attention.

Going from the showroom to the studio, the dark rooms are arranged along the one side, and the dressing rooms along the other aide, of the corridor, the studio itself being profuse in furniture and fittings.

For the purpose of gaining distance when required, here we found a novel arrangement employed, whereby the end of the studio can be removed, and by this means any convenient distance obtained.

The electric light for portrait work has been a study of Mr. Ayton for a long time past, and his many engagements at fancy balls and bazaars during the winter, where the electric light was the only illuminant used, has given him considerable experience and practice. A reflector used by Mr. Ayton, and which he considers gives him better results than the bell pattern, is an upright reflector of cardboard or white cloth, concave shape; by this style of reflector he feels that he gets a more diffused light, giving softer pictures, and with less pronounced shadows. When it was suggested that considerable light was lost by this style of open reflector, he felt that it was so, but that it did not interfere with the obtaining good results in a reasonable time.

He has also got the bell arrangement fitted in his studio, which he works along with an open light, so arranged as to lighten the shadows.

The engine-room is built alongside the studio on a lower level. A seven horse-power engine is what he uses.

The whole of this establishment is compact and complete, and the work turned out cannot but command approval and success.

Mr. Moffat (125, Princes-street, Edinburgh).

When visiting Mr. Moffat's studio, our memories went back to the time when, in the "positive" days, at a photographer's in the east end of Princes-street, a single picture was shown in a showcase all alone. It was about whole-plate size, as far as our memory serves us, and the subject was a scene from Tom Taylor's "Still Waters Run Deep," the characters being represented by Tom Mead and Charles Moorhouse. And what a sensation that single positive picture created at the time! That was Mr. Moffat's production, and hundreds of people flocked to see it. Doubtless it proved a profitable advertisement, but these were other days. The charm of the "positive" was upon us then; it has passed, and many are the processes that have to be tackled now if we wish to keep abreast of our fellows. Yet still we do not believe that any one picture by any of the processes of the present day would produce the universal admiration that the good old "positive" did in its time.

Now, at 125, Princes-street, on our visit, we find that, with the same energy as of yore, all branches of photography being worked and produced in Mr. Moffat's premises, the sons, following in the father's footsteps, undertaking the more active parts of an ever-increasing trade.

This business has so outgrown the premises at 125 that all the upper floors over the shops in 126 have had to be added to it, thus pretty well doubling their working accommodation. On the first floor there are three reception rooms adjoining each other; in these rooms an endless series of pictures are shown, illustrative of any kind of photographic work.

As a special feature, portraits in oils, from small up to life size, form the examples of one of the reception rooms.

Drawing on canvas from the negative is the method they use mostly, and which they consider best; but this means getting rid of any photographic basis, which is so liable to go wrong.

Specimens of flashlight pictures by the Slingsby arrangement were on view; also the latest group of the season—that of the Lord High Commissioner and party. Enlargements up to five feet, and direct pictures up to thirty inches, are here shown.

There are two studios in constant use, and the rooms, from the reception flat to the top of the building, are all utilised in developing some branch of the photographic art. In one of these departments we saw platinum pictures in dozens being developed by the hot-bath process, Mr. Moffat preferring it to the new cold-bath paper. Going up flat after flat till we reach the little balcony over the house-top,

we get confused and mixed, the only idea that keeps prominently before us being that here a great trade must be done, if only to cover the working expenses of the establishment.

All along the line Mr. Moffat keeps up to the times, and now, with two sons in the business—one essentially devoting his attention to the artistic department, and the other, with his many years' experience, in all the higher grades of the art-science—makes us feel that progression must be the natural result.

Mr. Crooke (103, Princes-street, Edinburgh).

Mr. Crooke's studio bears the impress of the man from the entrance way, of a cream and gold, right through the whole of the premises. The decorations, furniture, and fittings are original, and peculiarly his own. The "Judge" pictures, and many others of varied subject, from their original conception are familiar to us all. We felt the same with regard to his surroundings, they possessed an individuality as pronounced as are his well-known pictures.

In his studio there is not a door, a window, a fireplace, or a panel in the wall that is not turned to photographic utility, and becomes in his hands an accessory used in the production of artistic effects in pictures. Even the stairway to the studio is utilised upon occasions for groups and other artistic effects.

The studio is so arranged that pictures can be taken in any part of it, and the background can be moved to the sitter if a part of the ordinary fitting of the room does not answer the purpose required.

The upright light of the studio is a casing of glass, which runs along all the length of the apartment, and plants are growing between the front and back glass frames. The glass is fitted in panels of various patterns, and curtains are arranged in front of these, so that, in the composing of pictures, many charming effects of light are obtainable.

The doorways to the rooms that lead from the studio are all carved on the patterns, with elaborate designs at top, so constructed that they may form part of a picture at any time.

There are two fireplaces in the studio, the mantels and surroundings of which are also arranged with an eye to picture-making.

The walls all round the studio are fitted with old oak panels, and carved in beautiful designs. These also play a considerable part in the production of pictures.

In fact, everything in the place seems to have been thought out and arranged to answer the double purpose of being in itself a thing of beauty and a useful appliance in the prosecution of picture-making. The class of work produced by Mr. Crooke is so well known for its artistic excellence that comment upon the same is unnecessary.

Mr. Crooke was one of the first to push forward the claims of platinotype as being a process that was capable of producing the most artistic results, and by the beauty of the examples which he is constantly issuing he has certainly proved that his confidence was well placed.

The medals that have fallen to his share in the places where he has exhibited show that his pictures are appreciated far and wide, and that the name of Crooke on any exhibits is synonymous with an artistic production.

JOTTINGS.

It is a singular and perhaps felicitous coincidence, that concurrently with the publication of your leading article on "Exhibitions, Old and New," in which you give expression to the general rumour concerning the projected swagger photographic exhibition in Piccadilly that is to take the artistic world by storm and supplant that of the poor old Parent Society in public estimation, Mr. H. P. Robinson, in a contemporary, should take up a position before the walls of Jericho and blow his penny trumpet, with the expectation, or at least the hope, that those walls (i.e., the Photographic Society of Great Britain) will forthwith tumble down. Rumour, then, is, as you surmise, correct, and the rival exhibition is to take shape. Naturally the photographic world will be curious, and possibly anxious, to have the *raison-d'être* of the exhibition; and, as Mr. Robinson has evidently been put up (or has put himself up) to supply it, it will be interesting to find out whether that reason or reasons are of a nature to merit the applause of any body besides Mr. Robinson and his friends. Let us see.

Mr. Robinson's effusion is a bitter attack on the Photographic Society of Great Britain and all its works, with one exception, and that a remarkable one, the President, to wit, who is "an earnest student," "a master in science," and so forth. The President (who is also, by the way, President of the Camera Club, Mr. Robinson's new-found refuge) occasionally gives "real science," which Mr. Robinson confesses he does not understand. How, then, does he presume to distinguish between "real" science and the other thing? Not only is "scientific pedantry rampant" among the Society, but the meetings are "distinguished by dulness" (*sic*); the "platitudes of rudimentary science are discussed by the usual half-dozen members," while "art has for years been scarcely mentioned." Granted; but I should like to put to Mr. Robinson a question of a similar kind to that which I put to his companion in attack, Mr. W. Jerome Harrison, a few weeks ago, and this is: Did Mr. Robinson only discover these things when the officials of the Society refused to allow him to hang his pictures where he liked? If so, he was blind and deaf for several years; if not, how very strange that he was content to enjoy membership of such a Society so long! Was it because he always had things pretty much his own way at exhibition times that he was content to keep silence while this "merest trifling" went on?

Our critic graciously allows that the Society's exhibition was of use in former years. Clearly, for did it not provide Mr. Robinson with a trayful of medals? But the exhibition only exists now "because it pays"—the Society, of course. Did it only exist formerly because it paid—Mr. H. P. Robinson? The distinction between Mr. H. P. Robinson and the Society by Mr. H. P. Robinson is a very pretty and instructive conceit—instructive, because it is the key to the situation. The exhibition *now* "consists principally of pictures, or *so-called* pictures" (my italics), and, as no experts have been appointed to judge these pictures (or so-called pictures), some of those exhibitors who care for and respect their art will not exhibit this year. Besides Mr. Robinson himself, only Mr. Davison, so far as anybody knows, will be absentees. Are these gentlemen the "some?" Again, the system of judging in vogue this year will be practically identical with that under which Mr. Robinson obtained a large percentage of his medals, and what I want to know is why, as he ridicules that system, he accepted those medals over a period of thirty years?

The proportion between picture-makers and others on the Council of the Society comes in for analysis at Mr. Robinson's hands, and as there are only one or two picture-makers and a picture-copier of the first class upon it, and few who have exhibited at all, Mr. Robinson exclaims derisively, "From these are selected the judges of art!" But where on earth did Mr. Robinson imbibe the eccentric doctrine that a judge of art should himself be an artist? Competency to judge the qualities of, say, a beefsteak does not imply that the judge should necessarily be a butcher. Is Mr. Ruskin an artist? If the Society's judges, or some of them, in former years were not artists—and therefore not competent, according to the Robinsonian theory, to act—we must take it that some extraordinary blunders in the awards have been made, and that medals were given to the wrong people. Admitting the truth of Mr. Robinson's arguments, to how many of his Society's medals was Mr. Robinson justly entitled?

Mr. Robinson ingeniously tails off his article by pleading that the line should be drawn between the scientific and artistic branches of photography, and thence, with equal ingenuity, glides into a favourable word in advance for the "new exhibition." Exhibitions worthy of the art are what he wants; for it is preposterous of the Photographic Society of Great Britain, which snubs art (in the person of Mr. H. P. Robinson), to ask artists (that is, Mr. H. P. Robinson and Co.) to supply it with pictures for an annual show. Let the artists have an exhibition of their own. Hooray! They *will* have it next spring in Piccadilly, where Mr. H. P. Robinson will be able to place his own and his friends' pictures in the best positions, and get good big gold medals; the band will play, the policeman will be conspicuous by his absence, and the millennium of photographic art will be reached at last. So I say again, Hooray!

By the way, is it not an extraordinary circumstance that the below-the-belt attacks to which the Photographic Society of Great Britain has lately been subjected, should have emanated from two men who found to their cost that the Society was not disposed to consent to playing the *rôle* of stepping-stone to their personal aggrandisement and self-glorification — Mr. H. P. Robinson and "Talbot Archer?" A little bird whispers to me that my *exposé* of the latter individual has taught him a salutary lesson, the moral of which, I hope, will not be lost upon the former. So long as the Society's enemies are of the class of Messrs. H. P. Robinson and "Talbot Archer," it has nothing to fear. They only advertise it effectively, while at the same time they injure nobody but themselves.

Poor Mr. H. M. Hastings! What have you done to induce the Editor, in the key to the Convention group, to miscall you "Bickersteth?" I do not know who "Bickersteth" is, but to be mistaken for one whom I have heard called "the King of Hand Camerists" is an honour of which he may be proud. Never mind, Mr. Hastings; nobody will be misled by the error of nomenclature, for everybody knows Mr. H. M. Hastings in a picture, no matter how he is named.

COSMOS.

THE STEREOSCOPE AND STEREOSCOPIC PHOTOGRAPHY.

[Lewisham Camera Club.]

STEREOSCOPIC photography, which for several years after its introduction was an absorbing passion, afterwards, for some unaccountable reason, got under a cloud; but I am glad to observe that it is now again being presented, for it has very much to recommend it.

A stereoscopic picture differs from an ordinary one in the same degree and to the same extent as does any scene or object in nature when viewed with two eyes or with only one. In the former case we have the power of discriminating the relative distance of one object from another by the axis of the eyes having to converge to a greater or less degree, according to the varying distances at which objects are from the camera or point of sight from which they were taken. The two halves of a stereoscopic picture are the same, yet different. If you stretch out your arm and hold up one finger, you will find that on viewing the scene before you, first with the right eye and then with the left eye, the finger cuts a different part of the background with each, and that when looking with *both* eyes at the distance you are conscious of the finger being duplicated, whereas, when by converging the eyes you look at the finger, the distant objects are duplicated. This applies to every object, from that in the nearest foreground to extreme distance.

A binocular camera reproduces what the eyes see, and a stereoscope permits of these two similar, yet dissimilar, pictures being combined in the brain with all their different distances made apparent. This is the general principle of stereoscopic photography and the stereoscope, a term composed from two Greek words signifying, "I see solid."

The first stereoscope was one invented by Professor—afterwards Sir Charles—Wheatstone in 1838, who then explained its theory to the Royal Society. It was described as being intended for exhibiting two plane perspective views of an object taken from different stations, as one having the appearance of solidity. In this instrument two small mirrors placed V-shape form what is now the eyepiece, and the right and left-hand pictures are placed respectively at ten or twelve inches on either side, so that, when each eye is directed upon a slope of the mirror, it sees the picture which is reflected, and which may be one of dimensions very greatly exceeding those necessitated by the use of the modern stereoscope. It was imperative that pictures for the Wheatstone instrument had to be mounted singly.

The modern stereoscope was invented in 1849 by Sir David Brewster, who, in seeking to devise a means for superseding the bulky and cumbersome apparatus of Wheatstone, devised the lenticular stereoscope so well known by every one at the present day. In it the pictures are mounted side by side on one card, and are viewed by lenses of similar power, so arranged that the eye is directed to a portion situated between the centre and the edge.

The first stereoscopes of Brewster had eyepieces formed of a single lens of about six inches focus divided into two by being cut across with a diamond, and each half then trimmed into a round shape. The thinnest sides must be mounted to be next each other. When a pair of pictures are viewed through such an eyepiece, both are brought together, and form one image which is composed of the two.

Some idea may be formed of the importance of the stereoscopic business several years ago when I say that, in looking over an old book of photographic patents, I find that between the years 1860 and 1866 something like thirty-four new inventions in connexion with this instrument are recorded as having been introduced. These had reference mainly to mechanical improvements in the construction of the case, or the means of adjusting the lenses without affecting the principle of construction. One of them, however, deserves special mention. It was a pedestal stereoscope, containing several dozens of transparencies, the peculiarity being that, after a sufficient time had been allowed the spectator to examine the picture, it began slowly to fade away, another view gradually taking its place and increasing in brightness in proportion as the former one grew dim, precisely as the dissolving views are shown by a pair of well-managed lanterns. This stereoscope worked automatically by means of clockwork.

Undoubtedly the American hand stereoscope, invented by Oliver Wendell Holmes, the well-known author, is the simplest and best that has yet been introduced, at any rate for viewing slides printed on paper, although it is not so well adapted for transparencies as some others. The light is admitted to the slides from all sides, which obviates the necessity for the irksome dodging of the head required in the illumination of the picture in those with solid closed doors, as in Brewster's.

Stereoscopes of the American type, provided with achromatic eyepieces, and having all required adjustments, are now being made by enterprising specialists, and by the agency of such instruments stereoscopic pictures may be examined quite free from such imperfections as prevail with imperfect instruments fitted with imperfect lenses. Some examples are here submitted for your examination. Mr. J. Traill Taylor has shown, in articles on the Stereoscope published some years since, how that, by means of achromatic eyepieces of short focus, stereoscopic slides of the usual small size may be shown in the same apparent dimensions as the large pictures, which could only be exhibited in the extinct Wheatstone reflecting stereoscope.

Concerning the camera for taking stereoscopic pictures, little need be said. In former days, when so many confined themselves to this class of picture alone, the camera was made of the exact size of the slide, but photographers now prefer the option of taking either a pair of pictures by a movable partition, and a binocular front, or a single view covering the entire plate. For this reason the ordinary half-plate camera is much employed, although some prefer the original half-plate, formed by cutting a whole-plate exactly in two, or, as it is termed, the double quarter-plate. This latter size is advocated by Chadwick, who has devised a curtain roller division, capable of being extended to suit lenses of any focus, and of being quickly detached when a single view is wanted to cover the entire plate. An incidental advantage of this size lies in the fact of quarter-plates being more readily procurable than larger ones from dealers in small towns when one is away from home and happens to have exhausted his stock of plates.

As with cameras, each must please himself with regard to the lenses he uses; if they are to be five inches and upwards in focus, single lenses will answer quite well, even if the subject be an architectural one. A much shorter lens than this may be used for landscapes; but, if tall buildings of wide angles are wanted, then is it desirable that a non-distorting or rectilinear one be preferred, for, although the eyepieces of a stereoscope correct much, and, in some cases, all—distortion, yet as so many now use the half of a stereoscopic negative for making lantern transparencies by contact printing, it is as well to have them as perfect as possible. This must be held as applying not to landscapes, but only to buildings when using lenses of short focus.

Care must be taken that the stops of the lenses be of exactly equal size. As in every other kind of camera work, a quick-acting shutter should be fitted to the lenses, having an arrangement for keeping them open for a long exposure, such as is required in interiors, church interiors in particular.

Various methods have from time to time been advocated for producing stereoscopic effect upon a screen with the aid of a lantern. An ingenious device has been invented by Mr. Field, and described by Mr. J. Hay Taylor in the current number of the *Optical Magic Lantern Journal*, from which I will quote:—

"One of the two slides prepared from pictures taken by a stereoscopic camera is placed in one lantern, and the other slide in a second lantern. Into the optical system of each lantern is introduced a Nicols prism. A number of glass plates are placed at the requisite angle for producing polarisation by refraction, and enclosed in a convenient case or frame. These plates are so arranged in each lantern that the light from one will emerge polarised in a plane at right angles to that emerging from the other. The images of the two slides or pictures so polarised are projected and superposed on a screen, and are viewed by the observer through a pair of analysers of any construction capable of effecting the requisite

amount of analysation, and these are set with their planes of polarisation at right angles to each other. One analyser will permit the image of one of the pictures—the one polarised in the same plane to pass through to the eye, whilst the second picture, polarised in a plane at right angles to it, will not pass. With the second analyser this order is reversed, the image of the picture stopped by the first analyser passing through it, whilst the other is stopped. Therefore upon each eye of the observer the image of a different picture falls, and, as the two pictures are as nearly as possible superposed on the screen, an image of one stereoscopic picture falls upon the retina of one eye, and an image of the second stereoscopic picture upon a corresponding portion of the retina of the other eye. The conditions being fulfilled under which stereoscopic vision of two pictures is possible, the one picture seen appears in relief.

"The analysers designed for this purpose are made of a number of thin glass plates, and the necessary polarisation is effected by refraction. These glass plates are set at a proper angle in a mount resembling a very small opera glass or any other form more convenient.

"The plates are arranged at slightly varying angles to each other in the same plane, for, if a number of plates be placed flat one upon another, around the principal image a number of fainter images are formed, and thereby the definition or clearness of the principal one is impaired. By arranging the plates as described a well-defined picture is obtained."

On the table you will see a large collection of stereoscopes, kindly lent for the occasion by Mr. W. I. Chadwick, of Manchester.

A. L. Henderson.

ADVANCED PHOTOGRAPHIC WORK FOR AMATEURS.

VIII.

In a former article I referred to the blocking out of printed images on paper previous to toning and fixing, with the view of enabling the removal of undesirable backgrounds and the substitution of others; and, doubtless, no sooner will a keen worker have succeeded in producing such simple transformations than his mind will at once be struck with the very wide range of operations that become possible by means of such manipulations. I propose just to notice a few of these.

We are almost daily meeting with cases where amateurs desire to name their prints. In this respect there is a distinct desire shown to copy professional brethren, or it may be to merely impress a print with one's initials; for, doubtless, when turning over an album a well-arranged system of adding the names to the prints, whereby even a stranger may gather a knowledge of what the view represents, is most desirable. Hence every now and then we find writers describing methods of adding such names, and in nearly every instance the instructions given are, to subject the *negative* to some treatment, such as by printing backwards on the film, whereby the opaque letters will print white on the sensitised paper. More recently, special reversed types have been introduced by an enterprising firm for this purpose; but all such methods involve the preparation of the negative, and not one in a thousand is clever enough to cut, write, or print backhanded, whilst not a few fastidious gentlemen send their negatives to expert lithographers to have such titles printed on them. Now, all this means trouble, and expense, and, further, does not tend to improve a negative. I have often smiled at the ignorance displayed by amateurs when talking over how beautifully Armstrong writes backwards on his negatives; for, if the truth must be told, I could no more write beautifully backwards (or forwards, sometimes, either for that matter) than I could jump over Ben Lomond.

Others, again, recommend adding such titles to negatives by a system of transferring from the surface of other papers or suitable films, so that the negatives receive an impress from ordinary writing, but in reverse form.

Now, for amateurs merely, or in cases where an odd print now and again has only to be thrown off, there is really no need for any such trouble or bother. There is a far easier and better way whereby *any one* may throw off a print bearing the impress of any name or title that may be desired, and, once a worker experiences how simple and easy it is to name his prints in this manner, he will never dream of subjecting his negatives to any treatment.

This is the way to go about it: Take the pen you are accustomed to write with, and, having prepared a solution of Indian ink not just so thick as that provided for blocking-out purposes as previously described by me, and in a dull light, take the piece of sensitised albumen paper it is intended to print, and proceed to write on its surface on the exact spot you wish the naming to appear in the finished print. This is best done on the shadow portion of the picture, because the white lettering will then stand out in bold contrast. Having written the naming, or whatever else is desired, such as a special number or one's initials, place the sheet of paper carefully aside for a few minutes to dry. Do not attempt to blot it off, but let it dry of its own accord, and when thoroughly dry place the paper in contact with the negative, and print and tone as usual, rubbing off gently the black lettering in the first washing water.

This method is the one practised by most Continental photographers, and has the advantage of not tampering with the negative, and therefore permits of any alteration of title, or number, or initials that may be desired from time to time.

Once a worker enters fully into the advantages of blocking-out and working by opaque means *on the surface of the print*, he will have his eyes opened to much that previously puzzled him in many things photographic, such as lantern slides where transparent lights are relieved by opaque grounds on the screen, and many other similar uncommon results. But perhaps there is no more interesting application of this kind of working than to what is known as combination printing. A great many workers have an idea that a combination picture is necessarily a work of great difficulty, and one that requires the utmost skill in the preparation of a special negative or negatives for its production, and very likely will have formed some extraordinary ideas about the necessity of being able to work the collodion process, and further, to be an adept in the use of iodine, &c., and the floating off of one film so as to place it over that of another, before there be any possibility of producing a combination picture; and therefore they never attempt such work. Now, combination pictures can be produced with much ease by any one who enters fully into the spirit of this kind of working without resorting to collodion or floating of one or more films on to another.

The one means a combination negative, which is very rarely attempted; the other means combination printing from one or more negatives on separate supports.

By all means let any one who feels disposed to try his hand at combination printing begin with some *modest* attempt, don't start with a *difficult* subject. There are very many suitable ones to be found in every amateur collection of negatives. Just as an illustration, let me describe a very common example of combination work.

First, procure a negative of some river scene or artificial pond, or such as will permit of a swan being introduced into the picture; then get a good negative of a swan, one that is not too dense. I have even known instances where such a negative was made from a book illustration that had been well worked up. Of course, in producing these, some attention must be given to size of the figures or whatever else it is that is being printed in or combined with the main picture. Proceed, first, to block out on the swan negative the entire surroundings, so that the figure of the swan has no background. This done, proceed and print a copy from such. When printed, take into the dark room, and with the Indian ink block out carefully, after the manner described by me in a previous article, the figure of the swan on the surface of the paper, and set aside to thoroughly dry. When this is accomplished, take the print and place it in contact with the landscape or pond negative, seeing that the black image on the paper occupies a suitable place on the river or pond portion of the landscape negative; then print as usual. Even from a first attempt success is almost sure to follow: or, should there be some slight errors, these will only be from carelessness in blocking out, and are easily remedied.

There is really no end to combination printing, and advanced workers will find such pleasure in undertaking it that they will, before long, be found printing from quite a number of negatives. Like everything else, it is very easy when you once know how to do it. Even with the swan subject referred to, the effect may be heightened by the introduction of some figure into the picture, such as a little girl standing on the brink of the river or pond, holding out her hand in the act of feeding the bird. Interiors are also another fruitful source of good subjects for combination printing—in fact, there is no end to this fascinating branch of photography. The main thing is suitable negatives.

It frequently happens, however, to even the best workers that much chagrin is felt at the bad luck attending many an exposure when some object has moved just when the cap has been removed. I had a case of this sort quite recently, where a fine 15 × 12 negative and picture was spoiled by a cluster of ducks showing a movement on the part of two prominent ones, otherwise all the rest were fine and steady. Now, with many a fastidious worker, this would have been cast aside, but I sat quietly down and turned the two ducks into a good-sized swan, and this is how it was accomplished: Placing the negative on a retouching desk, I got hold of a nursery book in which I knew there were some good pictures of swans to be seen, and, taking one of these as my model, with the aid of a sable brush and oil colour, Prussian blue, I proceeded to draw in, on the film side, a picture of a swan, with its neck gracefully arched, just as it appeared in the

nursery book. This done, I set aside the oil colour to dry. This took some three days to do; but, when printed from, the surprise was complete, the two ducks were converted into a fine, graceful swan, and it would take a very close observer indeed to detect that any dodging had been resorted to. I am safe in saying not one in a hundred looking at this picture could detect, or even suspect, that such a manipulation had been made. Now, there may be an idea on the part of some of my readers that such work as this is only capable of being performed by one who is an expert with the brush or colour work, but such is quite an erroneous idea. There is no difficulty about it when the proper materials are used to accomplish it. It will be observed that I have stated I used Prussian blue. Had I used Indian ink, the result would, in this case, have been not nearly so good. Prussian blue, being a transparent colour, permits of middle tints being introduced as well as denser high lights, according to the thickness of the colour laid on when drawing in the image. Indian ink would have been useless in this case, because no middle tints would have been printed, and just the white flat splash of an image the result; but when transparent colours are used, and placed on in varying depths, we get a corresponding relief in the print that does not appear out of keeping with the rest of the picture.

T. N. Armstrong.

THE STEREOSCOPE.

[London and Provincial Photographic Association.]

In my humble opinion, there is no more beautiful or artistic branch of photography than is produced by the aid of the stereoscope. Some men (and women too, no doubt) see nothing in nature but materiality. That man is no more an artist than he is a musician who, in one of Beethoven's symphonies, hears only noise. Nor do I rank the man who persistently closes one eye when looking through the stereoscope, and tells you he sees two pictures if he uses both his optics, worthy of any consideration. That same man, no doubt, would not see anything whatever on the ground glass of a camera if he were allowed to place his head under the focussing cloth. That the stereoscope is an optical instrument capable of reproducing in apparent relief or solidity all natural objects, by uniting into one image two representations of these objects as seen by each eye separately, is well known. The stereoscope, no doubt, owes its origin to that great inventor, Sir Charles Wheatstone, and the following passage from Mayo's *Outlines of Human Physiology*, p. 288, published 1833, is the, as far as I can find, first clear enunciation of the principle on which it is constructed. "A solid object, being so placed as to be regarded by both eyes, projects a different perspective figure on each retina. Now, if these two perspectives be actually copied on paper and presented one to each eye, so as to fall on corresponding parts, the original solid figure will be apparently reproduced in such a manner that no effort of the imagination can make it appear as a representation of a plain surface." That the two eyes form different images of any objects that are near enough to have dissimilar perspective projection has long been known, and may readily be tested by any one. Thus: I close one eye, and hold a book before the other, so that its back edge obscures the covers; when I open the other eye, I shall be able to see the cover with its printed title. There is no doubt that a certain amount of common sense gives its aid equally to both eyes, to form the union of the two unlike pictures into one clear image. This common sense is especially exerted when the object is placed much nearer to one eye than to the other, so that the sizes as well as the forms of the two retinal pictures are sensibly different. By parallax, on account of the distance betwixt our eyes, we can distinguish, besides the front part, the two sides of a near object, and this gives a visible relievo to such objects, and helps greatly to raise or detach them from the plain in which they lie. Thus, the nose on a face is the more remarkably raised by our seeing both sides of it at once.

Not so very many years ago the stereoscope was to be seen in nearly every drawing-room, and was, no doubt, one of the most popular scientific instruments. Why it has of late years gone out of fashion I cannot understand. Is it that the advent of the amateur taking up photography from nearly every standpoint has had any effect? Certainly very few amateurs take up the stereoscopic side of photography, and I feel certain that a great number of them do not do so from the fact of their believing there are certain *great* difficulties in the art of producing good stereoscopic slides. When the difference between monocular and binocular vision is understood, and the theory that the mind completely fuses the two dissimilar pictures into one is grasped, I see no difficulty that should prevent an artistic and painstaking amateur from producing as good stereoscopic slides as lantern slides; in fact, there is less technical excellence wanted in a stereoscopic slide than in a lantern slide, for the former does not have its faults magnified to so great a degree; and, if the subject is rightly chosen, I am sure the little extra trouble it takes to produce stereoscopic is well recompensed by the beautiful result.

I will not occupy your time by describing the various methods of taking stereoscopic negatives with a single camera and one lens, but will refer you to the very graphic description given by Mr. Traill Taylor in The British Photographic Journal Almanac for 1887, page 53. He is a past-master in the art and science of the stereoscope, and was taking stereoscopic pictures at the last Convention. I must at once say I do not care for the single camera and lens for stereoscopic work. No doubt, for "still-life" pictures and landscapes where there is no life or movement, it is possible to get a good negative; but the variations of light occurring even between a first and second exposure, and the great difficulty of getting both halves of a negative equally exposed, induced me to commence my experience in this branch of photography with a double camera and twin lenses. I will therefore give you my experience, and show you results from the taking of the negative to the making of the transparency.

In the first place, I find a half-plate camera the most useful size for taking the stereoscopic negative, because it has the advantage of being a universal size, and plates of all brands can always be readily obtained. Secondly, the extra height in the picture given on the half of the half-plate allows a certain amount of latitude in the choice of foreground and sky. The ordinary half-plate camera of square form is easily convertible into a double camera by having an expanding partition that divides the camera into two compartments. A cross front of simple form, with the flanges for two lenses, can be used, in which case they should be fixed about two and three-quarter inches apart from centre to centre.

I prefer, however, a dividing front, by which I get a varying distance between the lenses from about two and a quarter to three and three-quarter inches. I have found it absolutely necessary with subjects with near foreground and others with distant foreground to have the means at command for altering the distances between the lenses, and that the fixed separation did not give the best results for all subjects.

The greater the distance of the *nearest* object in the picture, the wider the lenses have to be apart, and *vice versâ*. This can be carried to such extremes that, in taking very distant views of the seashore from the deck of a ship, one picture may be taken by uncapping the lens, and, when the vessel has travelled a hundred yards or so, the other half of the picture may be taken. I do not find, however, that very distant views give an adequate idea of the beauties of the stereoscope. I always endeavour to have an interesting piece of foreground, and, if that is not possible, put a figure in, and the difference in the effect is surprising.

Now, as regards the shutter most suitable. I found some little difficulty in getting quite what I wanted for lenses with a varying distance between their centres, unless I went in for some elaborate arrangement, working directly in from off the plate, and fixed inside the camera. I therefore devised the simple attachment here shown, which consist of two flaps, one of which is *fixed* to a steel spindle, and the other is movable along same, so that, when the desired width between the two lenses is fixed upon, the movable flap is fixed by the small set screw. The two flaps can then be worked simultaneously by the aid of a spiral wire, which prevents any vibration of the camera, and allows of "time" or rapid exposures enough for almost any suitable stereoscopic work, and I have taken many "instantaneous" pictures with it.

As regards lenses, I give my preference to single landscape lenses of from five inches to seven inches focus for all general work, as giving the most brilliant pictures. For architectural work I always carry a pair of R.R. lenses of five and a half inches focus, and I find Voightlander's orthoscopic lenses very fine lenses indeed, and giving grand definition. I would advise gentlemen, when ordering a *pair* of lenses, to see that they get them. The appearance upon the focussing screen of two equally sharp images is no guide as to the exact coincidence of the focus of the two lenses. Do not use iris diaphragms for stereoscopic lenses, for, no matter what the makers may tell you about the great care their individual firm use in marking out the different apertures for the "iris," between these calculations and the engraver's markings on the lens mount, a difference creeps in, and you will find on development, no matter what care you use in setting the "iris," that one half of the stereoscopic picture will develop up much sharper than the other.

I will just make one remark about exposure, which will save a beginner many a pang. Give a generous exposure when taking stereoscopic negatives, or you will have "snowy" pictures. Nothing is more galling than to be asked by one's friend, when showing him

one of your best slides, if it was snowing when you took the picture; although, by the leaves on the trees, he ought to have been able to see it was midsummer when the picture was taken. In a monocular photograph, a bit of white may be allowed upon the trees, and roofs, and pavement; but with a stereoscopic slide, otherwise specially good, the snowy appearance will entirely ruin its artistic beauty. Give, therefore, a generous exposure, develop up carefully with weak solution, and aim at a somewhat thin negative with full detail.

W. P. Dando.

ROYAL CORNWALL POLYTECHNIC SOCIETY, FALMOUTH EXHIBITION.

Photographic Section.

Judges' Awards.

First Silver Medals.—R. H. Lord, W. M. Warnenke.

Second Silver.—W. J. Byrne, H. Tonkin, F. H. Peckford.

First Bronze.—W. H. Harrison, W. Scorer, J. Milman Brown, T. Protheroe, C. A. Roe, Major J. D. Lysaght, A. Nicholson, H. D. Arnott.

Second Bronze.—W. J. Anckorn, A. W. Gottlieb.

Hon. Mentions.—A. Gaye, A. G. Tagliaferro.

NEW TONING BATH FOR GELATINO-CHLORIDE PAPER.

In connexion with his new toning bath for gelatino-chloride paper which he introduced to the meeting of the London and Provincial Photographic Association on August 11, Mr. W. D. Welford has favoured us with the following further particulars:—

Those who have worked years ago with prints from wet-plate negatives will remember the simple bicarbonate of soda toning bath, and the somewhat washy nature of the results which made it useful for very brilliant prints, but not suitable for others. A slight bleaching action takes place, which was in turn an advantage and a nuisance. Remembering this, I tried the old formulas upon the new Eastman paper, but found no gain in any way until the strength of the bath was increased. I claim nothing for the use of bicarbonate of soda in the toning, but I do claim to have introduced a bath for chloride prints that possesses several valuable points which are as follows:—

1. The bath is made at time of use.
2. It is simplicity itself.
3. It tones the prints quicker than any other.
4. The unevenness of toning, which is usually the bugbear of chloride prints, absolutely annihilated.
5. It gives a pleasing grey black tone, resembling platinotype.
6. Over-toning impossible.

The prints are completely toned in one and a half to two minutes. The tray need not be moved at all, and if six prints are immersed it takes all the operator's time to keep them going. As fast as he can get them out of the tray he can insert a fresh print. Uneven or partial toning is really one of the strongest points, because, as a matter of fact, unless the prints show some trace of this, I get suspicious. I can completely tone half a print first, then the other half, and no dividing line is apparent. A dozen air bubbles or streaks can be left on the print, with the result of a dozen bright and red spots upon the otherwise finished print; and yet, if these be covered over and the toning continued, there is no trace whatever when finished.

The fact is, and here lies the merit of the whole thing, a definite tone being obtained, no amount of immersion in the solution (within reason, of course) will alter that tone, so that, in the case of red spots, they merely *catch up* to the other part. This is very apparent if a print be toned in, say, four sections, as it is impossible to show the four degrees, the second one toning to the level of the first before the third can get a start. As regards over-toning, I have left the prints an hour without any difference between them and those taken out in two minutes.

I claim that this bath makes the chloride paper easier and quicker to finish than any other silver paper, and it will even bear a favourable comparison with any method of printing and finishing at present in use.

The bath is as follows:—

Gold chloride	4 grains.
Bicarbonate soda	1½ drachms.
Water	6 ounces.

It will be noticed that, compared with the usual baths, it is exceedingly strong. I claim that, in conjunction with the use of bicarbonate of soda, as the feature of it. I see, in an American paper, that bicarbonate of soda is recommended, and in England borax is mentioned. But neither of these use such a strong bath. As a point of comparison, let me place the two baths together.

Usual Carbonate Bath.

Gold	4 grains.
Bicarbonate of soda	16 „
Water	32 ounces.

My Bath.

Gold	4 grains.
Bicarbonate of soda	90 „
Water	6 ounces.

It is evident, therefore, that I have done more than merely recommend the usual and old bicarbonate bath.

The prints need washing before toning, a slight rinse afterwards, and final fixing in a weak solution of hypo (say, one to six) for about ten minutes. Over-printing is necessary to allow for the bleaching and reducing action, but the actual toning of the print does not change at any period of the fixing. The print must be judged by looking through, to a strong light. As soon as the last trace of red or brown has gone it is finished.

For those who prefer a warmer tone and slower action, it is only necessary to double the quantity of water and rock the tray.

My own opinion—doubtless an egotistical one—is that this bath will do much to popularise the use of gelatino-chloride papers; because, although the manufacturers declare that a child can tone their paper, and that if a photographer cannot he is a muff, yet I am certain that many *have* found difficulties in toning, which all those who have worked with the above bath declare to have completely vanished.

HARMONISING HARSH NEGATIVES.*

A method of intensifying the shadow detail without increasing the density of the high lights to a greater extent by bleaching the surface of the negative with mercury, stopping the action before the whole thickness of the high lights is affected, washing well and blackening with any of the usual agents, was demonstrated before us by Mr. Roland Whiting, and will be found useful.

A similar method has been repeatedly advocated by Mr. Chapman Jones, the agent being the uranium intensifier.

As this intensifier performs its work at one operation, it is claimed that the action can be stopped as soon as the shadow detail has been sufficiently strengthened, and before the lights have been intensified right through. I tried this on several occasions about a year ago, but was never successful in stopping the action at the right moment, the red colour of the intensified parts differing so much from the normal appearance of the negative makes the process a little confusing, and it is not easy to estimate the value of the added strength. At the same time I accidentally found out that ammonia would entirely remove the red deposit, and hoped that by intensifying the negative fully, and afterwards painting out the red stains from the lights with ammonia, I might obtain the desired results. I found, however, that it was difficult to control the action of the ammonia when dealing with fine lines, sprays of leaves, &c., and gave up the use of it. I see that Mr. J. Hodges has an article in the number of the *Quarterly* previously referred to in which he advocates this method. He shows prints from a negative before and after treatment to which I call your attention.

You will see from these that Mr. Hodges works his method with complete success. His acknowledged skill in all branches of photographic work entitles his method to consideration and trial by those who have time to acquire the manual dexterity necessary to work it successfully. I think the method will be found most useful when broad masses of light half-tone, merging into the shadows, are to be treated. It must be remembered that both Mr. Chapman Jones's and Mr. Roland Whiting's method of intensifying the shadow detail also strengthen the high lights. Neither of these methods nor that of Mr. Hodges will be found satisfactory when the negative is already too dense in the high lights. Even if we were by any of these methods able to strengthen the shadow detail to such an extent that the light half-tone would print out before the shadows were blocked up, the negative would be so dense that printing would be enormously prolonged, to the deterioration of the printing paper.

What we require in such cases is that the reducer should act upon the high lights at the back of the plate, and leave the shadow detail unaltered. Should the latter be then too thin, we can intensify the whole negative without the brilliancy becoming too pronounced.

* Continued from page 540.

I desire to call your attention to a method of working which will yield such a result.

Shortly after giving up the use of the uranium intensifier in connexion with hard negatives, I observed this formula, and instructions in the editorial column of the *Amateur Photographer* (October 2, 1891):—

"The only way to reduce the dense portions of a very hard negative without reducing the shadows is to wash free from hypo, and then immerse in:—

Hydrochloric acid (pure)	9 drops,
Bichromate of potash	30 grains,
Alum	10 ,,
Water	1 ounce,

till thoroughly bleached, then wash well for an hour or more, and redevelop with a weak and well-restrained ferrous oxalate developer, and stop the development as soon as the shadows have developed, and before the high lights are reduced right through, then refix."

This appeared to promise well, and I tried it. For redevelopment I used the ferrous oxalate I had prepared for alpha paper, as it met the requirements if weak and well restrained.

Repeated trials gave me nothing more than a ghost image after prolonged development, when viewed after fixation.

On making inquiries, I was told by a worker whom I considered an authority on the subject that the chloride of silver image produced by rehalogenisation was so insensitive that a prolonged exposure to daylight would be necessary. This necessitated previous drying to prevent irregular action, and of course added to the trouble of the process. I found after exposure to daylight that the image developed readily enough; but a new difficulty arose, it was impossible to tell when the action of the light had penetrated to a sufficient depth into the film, and if it went too far the hypo was unable to dissolve out the orange-coloured light product, with the result that, while the shadow detail was by development of a black tone, the undeveloped high lights, if solarisation had taken place, were of a strong non-actinic orange tint, and for printing purposes just as strong as at first. The process seemed too uncertain to be of much practical use, and I abandoned it.

Some time after this Mr. Chapman Jones referred to a similar process, in which chloride of iron was the rehalogenising agent, the result, of course, being again chloride of silver.

I felt that such a process, if it could be worked with certainty, would be most useful, and it occurred to me that, if bromide of silver could be substituted for chloride of silver as the haloid salt, it would be much more sensitive to artificial light, and the whole operation could be carried out in the evening. I was acquainted with and had used Captain Abney's formula for resensitising light-struck but undeveloped plates, viz., bichromate of potassium, and bromide of potassium. This is inert upon the metallic silver image produced by development; but, knowing the power of bichromate of potassium as an oxidiser to assist the acids in combining with the metals, I believed that the addition of nitric acid would accomplish my purpose. Clearly, it was necessary that the bromide of potassium should be present from the first to change the nitrate of silver as it was formed into an insoluble salt, or the image would be washed away. A few trials led me to adopt the following formula and method of working:—

Bichromate of potassium	10 grains.
Bromide of potassium	5 ,,
Water	1 ounce.

Bath the plate, and allow the solution to permeate the film. Pour the solution off, and add to it five drops of nitric acid. Again flood the plate, and the image will be converted into bromide of silver. Allow the action to proceed through the film. Bath in three changes of alum to remove the bichromate and harden the film, and wash thoroughly in water. As the operations are carried out in white light, such as that of gas or a lamp, the plate is amply exposed by the time the washing is complete.

For development I abandoned iron as being troublesome to make up when a single negative had to be treated and had to be followed by a clearing bath before fixation. I tried hydroquinone as being something of the same character, but found that it frilled the film off the plate whether the caustic alkalies or the carbonates were used. The previous long soaking would account for this. I then tried pyro, and found it quite suitable. Any preservative may be used (my favourite is nitric acid), but, as there is nothing on the plate but the image to be affected by the developer there is no necessity to use a bromide. A small trace may be useful to control development, but, if any bichromate of potassium remains in the film, it will unite with the bromide, and convert the image back into bromide of silver as fast as it is developed. The formula I generally use is:—

Pyro	2 grains.
Ammonia	2 minims.
Bromide of potassium (if used at all)	¼ grain.

As the shadow detail lies upon the surface, it will first be developed, the half-tone will follow, and the high lights will remain white when viewed from the back of the plate for some time. As the surface of the film will veil over as soon as the developer begins to act, the progress must be judged entirely from the back of the plate. The only judgment required in the process is in stopping the development at the right time. If stopped too soon, the negative will be flat; if carried too far, the negative will still be hard. It will be well to have ready for reference a print from the negative in which the shadows have been printed to their proper depth. When the lightest half-tone which shows in the print is nearly, but not quite, blackened through by the developer on viewing the plate from the back, the action should be stopped, the plate washed, and transferred to the hypo, which will speedily dissolve out the undeveloped silver in the high lights, leaving the negative much thinner in the high lights than it originally was. A little practice with waste negatives will give the required power of judgment.

A negative which is hard from under-exposure, and one which has been fully exposed but is hard from over-development, will not present the same appearance during redevelopment after rehalogenisation. If the former be redeveloped right through, the high lights will appear black at the back of the plate. The high lights in the fully exposed negative will never appear black however far the redevelopment may be pushed, and, as the layers of white-coloured silver present in this case will not be dissolved out by the hypo, an allowance for this must be made in redevelopment, or the negative will still be too dense. There is no theoretical objection to the negative being again treated by the process to obtain the required reduction, but in practice there is an additional risk of stains appearing the second time. It is better to err on the side of under-development and intensify if necessary.

I found the method so successful that I should probably never have tried the chloride method again, and would have supposed it to be too uncertain for practical work; when, however, I was asked to make this process the subject of a paper, it became necessary to investigate the matter a little more closely lest I should lead some one astray. By the experience I had acquired I suspected the "weak and well-restrained ferrous-oxalate developer" to have been the cause of my early troubles. On rehalogenising a negative by the chloride process I found that the exposure to lamp light was quite sufficient if developed with pyro, and the image all that was required. I would, however, in future omit the alum from the solution and reduce the bichromate of potassium to 10 or 12 grains per ounce, and the hydrochloric acid to 5 drops. We have, then, two methods to work with, and, though I think the bromide is a little more under control, this probably arises from my having had more experience with it. J. McINTOSH.

(*To be concluded.*)

Our Editorial Table.

SUNSHINE.

By AMY JOHNSON, LL.A. London: Macmillan & Co.

WHAT Mrs. Barbauld, in her *Evenings at Home*, and the Author of *Sandford and Merton*, together with like popular educational writers did for children of former times, Miss Amy Johnson is endeavouring to do in her book *Sunshine*, in which science-teaching is brought up to date. It will be readily admitted that the imparting of scientific knowledge, more especially the science of the sunbeam, to children more or less young, is a task of very considerable difficulty, and one which comparatively few would have the courage to undertake. Yet here we find an evidently talented and well-read lady filling a volume of over 500 pages with discourses to young folks—a real or imaginary class—on such topics as the nature of sunshine, reflection, refraction, the formation of images by pinholes and lenses, the camera and the stereoscope, shadow pantomimes, and even sundials. We can strongly commend Miss Johnson's book as one replete with useful information, given in a taking style. But we might, without seeking to detract from the work, hint to our authoress that, while she is quite correct in surmising that the photographers' lenses (in stereoscopic photography) must be exactly alike, she is wrong in saying that "as it is

impossible to make two lenses alike, even out of the same glass, one lens is cut exactly in two, and the halves are placed at a distance of two and a half inches, which is about the distance between our eyes." This, we are aware, was taught in some measure by Sir David Brewster, but it does not apply to binocular photographic practice of the present day.

The work is profusely illustrated, and is well printed. Price 6*s*.

Ilford Printing-out Paper.

It is scarcely necessary we should again say that this paper is not surfaced with albumen, but with gelatine. Paper of this sort has much to commend it, not the least being the getting rid of sulphur, which is recognised as a powerful element in albumen. The Ilford printing-out paper has a beautiful surface, and prints rapidly to a fine purple tone. In our trials we employed a toning and fixing bath in one, and obtained every kind of tone we desired, from a red, passing through purple, on to one of platinum blackness. No special over-printing was required to obtain even this last effect, as by the system of toning and fixing we adopted there was but little reduction of the image.

Photographic Convention Pictures.

(Snap-shots with Fallowfield's Minit Hand Camera.)

Mr. F. W. Hindley is an expert snap-shottist, if we judge by a series of pictures of this class taken by him during the recent convention at Edinburgh. Here we have a group waiting to enter a railway carriage, and there we have Miss Barnes in the act of uncapping her lens, with a winning smile on her countenance, doubtless induced by pleasant conversation with some of those in her proximity. Other views represent scenes in the fishing village of Newhaven, at Abbotsford, Melrose, and other places in Scotland. All are excellent.

Mr. H. M. Hastings sends us a characteristic group of gentlemen, more or less well known in the photographic world, taken during one of the Convention outings at Cramond. As Mr. Hastings is a master in hand-camera work, it is scarcely necessary for us to say that this one is technically perfect.

A Convention Group.

By John Stuart, Glasgow.

This beautiful group was taken by a Zeiss lens, of 7¾-inch focus, working at *f*-12·5. The size is whole-plate; the definition is excellent. It is well printed on gelatino-chloride paper, of which process Mr. Stuart is a highly successful exponent.

PHOTOGRAPHY AND ARCHÆOLOGY.

The Report of the Committee of the British Association, consisting of Mr. E. Seward (Secretary), the Marquis of Bute, Messrs. G. T. Clark, R. W. Atkinson, Franklen G. Evans, C. Tanfield Vachell, James Bell, T. H. Thomas, and Dr. J. G. Garson, appointed to report on the Prehistoric and Ancient Remains of Glamorganshire, stated that the Cardiff Amateur Photographic Society, by means of prizes offered to their members, have produced some hundreds of valuable original photographs of prehistoric and ancient objects in the county, most of such objects within the county having thereby been illustrated. This collection, which is believed to be the most extensive yet formed in any district, is stored at the Cardiff Free Library. The Corporation have given good aid to the work by important grants to the prize fund.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 14,703.—"Improvements in Sensitised Films, and in Sensitive Emulsions therefor." J. H. P. Gillard.—*Dated August* 15, 1892.

No. 14,749.—"Improvements in Photographic Cameras." E. H. P. Humphreys and W. Friese-Greene.—*Dated August* 16, 1892.

No. 14,753.—"Improvements in and relating to Photographic Cameras." W. Griffiths.—*Dated August* 16, 1892.

No. 14,856.—"Improvements in Photographic Cameras used for Astronomical Surveying or Ordinary Purposes. H. Schlichter.—*Dated August* 17, 1892.

No. 14,952.—"Improvements in Photographic Cameras and in Shutters connected therewith. J. Shew.—*Dated August* 19, 1892.

SPECIFICATION PUBLISHED.

Reprint.

1890.

No. 10,871.—"Automatic Photographic Machines." Touffreville.

PATENTS COMPLETED.

An Improved Photographic Developing Apparatus.

No. 6013. Arthur Brin, 1, Charlton-villas, Park-road, Twickenham.—*July* 30, 1892.

My invention relates to a photographic developing box, whereby negatives or positives may be developed in the open without recourse to the ordinary dark room or tent.

It consists of a narrow, upright, liquid-tight box, provided with non-actinic transparent sides to enable the development to be watched, and combined with means whereby the developing and washing liquids may be quickly introduced and withdrawn in succession, each liquid being for this purpose contained in a separate elastic pneumatic bulb or pump barrel, connected by a flexible or other tube with the lower part of the box, a clip, or other means of interrupting the flow through the pipe being provided to enable the solution to be held in reserve or kept in action as long as may be required.

The inlet of the box at which the negative or positive is introduced is surmounted by a chamber, with which the dark back of the camera is adapted to make a light-tight joint, the interior of the chamber being of such shape as to guide the negative or positive through the inlet of the developing box, in whatever position it be delivered from the dark slide.

A lifter of clear transparent celluloid is provided, in which the negative or positive is held during development and consequent operations, and by which it may be readily withdrawn when completed.

The dark back is provided with a door or slide, opening into the said chamber, at which the negative or positive may be dropped or slid on to the incline guides leading to the developing box, and means are provided for ensuring correct register of the said door or slide with the box-inlet.

By the employment of the pneumatic bulbs, the liquids are not run to waste, but are automatically withdrawn from the box and returned to their proper reservoirs for re-use as often as may be required, thus avoiding the necessity of replenishing after each development, and of carrying a supply for that purpose.

A New or Improved Apparatus for Obtaining Bird's-eye Photographic Views.

(A communication from Ludwig Rohrmann, Krauschwitz, Germany.)

No. 12,669. Edmund Edwards, 35, Southampton-buildings, Chancery-lane, Middlesex.—*July* 30, 1892.

The present invention is applicable more especially to military operations by taking photographic bird's-eye views of fortifications, or other positions occupied by an enemy, from a distant position where they are not visible.

It may be also applied to other operations not of a military nature, such as taking bird's-eye views of buildings, estates, or land.

The improved arrangement consists of a parachute, having hung to it below an instantaneous photographic apparatus, the parachute in its closed condition being contained in a space prepared for it in a suitable projectile. The projectile is fired high in the air, in the direction of the object to be photographed, a charge of explosive being then ignited, and the parachute apparatus being thereby set free from the projectile. The parachute then operates automatically, falling by itself, the photographic apparatus hanging perpendicularly below it, and by a suitable arrangement taking one or more instantaneous photographs of the positions on the earth below, the parachute being then brought back to the point from which it was projected by a line, one end of which is attached to it, the other being retained at the starting point.

In one method of putting the invention in operation, a rocket is used, a space in the front end or cap of which contains the parachute apparatus. This rocket is ignited and fired from a stand of the usual kind, or any other suitable support. During the flight of the rocket, the ignited composition in the latter reaches a fuse, and fires an explosive charge in the front end. This explosion bursts open the rocket-cap, which is made of earthenware or sheet iron, the parachute apparatus being prevented from injury by the fire by means of a plate or pad of asbestos. In order that the rocket-cap may free the parachute apparatus with certainty, it may be made with grooves or notches, so as to weaken the material, and allow a small explosion to bust open the cap. Or it may be so arranged that, if sheet iron is used, the latter is unrolled or flattened out. The parachute apparatus is perfectly independent after this, as already explained.

The attaching cord is fastened where the apparatus is attached to the parachute, and is led through a hole in the rocket-cap, or beneath the latter, to a winding drum at the firing point, which may be worked by a small steam-engine or by hand. Insulated electrical wires may be carried by, or form part of, the connecting cable, and in this case the mechanism of the photographic apparatus may be worked by their means from the starting point. About three metres of the line, where it adjoins the parachute, are made of wire to prevent the risk of its being burned.

In order that the improved apparatus described for taking bird's-eye views may be projected to greater distances, the parachute may be fired from an ordinary gun, instead of a rocket being used. In this case the folded parachute and the photographic apparatus are contained in a cylindrical shell having a pointed end in front, into which a time-fuse is screwed, which is fired in the usual way by the explosion, and exactly at the determined time

ignites the bursting charge, so that the parachute and photographing apparatus are set free.

In this case also the parachute is separated from the bursting charge by a pad of asbestos, so that it is prevented from being injured by the fire.

The gun used is a muzzle-loading mortar of sufficient length, which is carried by, and adjustable in, a suitable frame. In the barrel parallel air grooves are made, which are not rifled as in ordinary guns, as the revolution of the shell would break the connecting line, which is laid in one of the longitudinal grooves in the barrel.

Between the shell and the cartridge, which latter is fired through a touch-hole, an arched disc or plate of iron is inserted to prevent the possible breaking of the shell and the parachute apparatus when the gun is fired. The plate is shot out of the gun, and then falls to the ground. The parachute, which is of the ordinary well-known construction, opens out as soon as it is freed, and the photographic apparatus hangs perpendicularly below it. By a suitable arrangement the parachute is prevented from collapsing.

The photographic apparatus is of the kind used for taking instantaneous pictures. With it is combined spring clockwork, which is wound up before the gun is fired, and must be arranged according to the calculated time of flight. It then comes into operation and effects the instantaneous exposure of a plate, when is then moved sideways from its position, leaving another plate in position for a fresh exposure, and so on. In this way, by a single shot, six to eight exposures may be made.

It is evident that, by means of a series of exposures, a complete circle of views round the firing point may be obtained.

For this purpose, as many shots as are necessary are fired in succession from the firing point as a centre, so that, when the several pictures are put together, a complete map of the country may be obtained.

The following is one of the forms of photographic apparatus which may be used with advantage :—The apparatus hangs below the parachute, with its lens pointed down, and consists of an ordinary chamber or camera, containing the plates for exposure, and another adjoining chamber, into which they are removed after exposure. The plates, each fitted in a wooden slide, are arranged one above the other in the first chamber. Above the pile of plates is arranged a pressure plate, which presses the plates downwards by means of springs. The lower edges of each plate-slide are fitted with two parallel toothed racks, and the racks upon the lowest slide gear with corresponding toothed wheels, driven by the clockwork contained in a chamber at the lower part of the apparatus. This clockwork also serves to open and close the lens in order to expose the plates and obtain the pictures. When this has been done, the lowest slide is removed by the toothed racks and wheels, together with the exposed plate which it contains, into the adjoining chamber. The bevelled edge of the next slide, after the plate in it has been exposed, is passed under the edge of the first one, which it lifts as it is removed from the first chamber into the second, and this operation is repeated for as many plates as are contained in the apparatus. A space for single plates may be left above the second chamber.

In the construction of the parachute, the ribs of the latter are preferably jointed to a central cap, and to these ribs are jointed radial stays, as in ordinary umbrellas. The inner ends of these stays are jointed to a central plate, which is connected to the upper cap by a spring, which draws them together, so that the parachute is at once automatically opened as soon as it is set free from the shell, as already described.

The photographic apparatus is hung by lines from the ribs of the parachute, the lower ends of these lines being connected to a universal joint, from which the photographic apparatus is suspended, so that the latter is not affected by the oscillations of the parachute. To this universal joint the connecting line to the firing point is also attached.

Improvements in Photographic Cameras.

No. 16,708. Adolf Hesekiel, 32, Landsbergerstrasse, Berlin, N.O. 18, Germany.—*July* 30, 1892.

The object of the invention is, firstly, to economise space in the storage of the sensitive plates within the camera, and it consists in arranging side to side, or one above the other, two chambers, each intended to be filled with the holders, in which the sensitive plates are separately placed, so that as each plate is exposed it may be moved from the one chamber to the other, the remaining plates in each chamber being shifted, the one set forward, the other backward, to provide space for the plate so moved, and to replace the vacant space at the back of the first chamber with a plate from the second chamber. This is effected by two slides joined together by a bridge, so that they must be moved simultaneously; the one slide is adapted to catch under the recently exposed plate, so that, when the slides are lifted or drawn out, this plate is conveyed to the other chamber and left there; the other slide is adapted to catch over the plate at the other end of the said chamber, so that, when the slides are moved in again, this plate is carried from the second to the first chamber. Springs press the plates along in the chambers.

The number of plates moved—that is, of exposures made—is indicated by the following contrivance :—A numbered disc is pivoted so that a number on the circumference may show before a small window in the back of the camera. This disc carries an interiorly toothed wheel with inclined teeth. On one of the slides is a pin, so that, when the slide is moved into its outermost position, this pin comes in contact with the side of one of the teeth, and moves this tooth with the wheel and disc; on the return of the slide the same pin strikes on the opposite side of the wheel and moves the wheel by arriving against the inclined face of a tooth on this side thus with both movements, changing the position of the disc sufficiently to bring the next succeeding number before the window.

A further improvement relates to the focussing and finding of the view when the plates remain in position in the camera. The rays from the lens are deflected by an inclined mirror on to a ground glass at right angles to the sensitive plate in the known manner; but this ground-glass plate is enclosed in a space provided with a door, so that darkness prevailing in this space even with the door open the view is much more clearly seen than when the ground glass is in the outside of the camera, no focussing cloth being required. As the ground glass is a part of the wall of the actual camera or photographing chamber itself, the mirror is hinged so that it may be closed over the ground glass and thus prevent access of light through the latter; when the mirror is in position for focussing or view-finding, it lies upon a screen preventing passage of light to the plate hidden behind the mirror, the latter covering the hole in the screen through which the light would otherwise pass from the lens to the plate.

It is preferable that the door aforesaid should only be opened when the mirror is actually in position for focussing. This is effected by providing a spring for closing the door and a rod for thrusting the latter open, this rod being moved by a rotary arm or tappet on a spindle turned by the operator. The spindle carries a second arm with a pin engaging in a slot in the side of the frame of the mirror, so that by turning the spindle the mirror may be moved into or out of position for focussing; the tappet does not strike the rod until after the mirror is in position for focussing, and it leaves the rod before the mirror is moved on the reverse motion of the spindle.

Improvements in or relating to Photographic Cameras.

No. 20,007. Xavier Gustave Edouard de Faucompré, 33, Boulevard Haussmann, Paris, France.—*July* 30, 1892.

This invention relates to that class of photographic cameras in which the sensitive film is formed by or upon a continuous web carried by rollers and adapted for taking a number of negatives in succession, and the improvements which are applied to the mechanism for actuating the rollers carrying the web are designed mainly to ensure by automatic action of the various parts that it may not be possible for the operator to make any mistake in bringing a fresh portion of the web into proper position after taking each negative.

The apparatus is enclosed in a box, which only presents externally a push button, an eyepiece, two orifices to receive keys, whereby the rollers are turned, and a movable slide or screen. Between the sides of a wooden frame are placed a number of rollers; one of them, the supply roller, carries the web of sensitive material unacted on, and another serves as the roller upon which the web is wound as the negatives are taken upon the sensitive film, which is stretched vertically between guide rollers. The supply and receiving rollers are alike, and are interchangeable, and they may be removed and replaced. These rollers are made of wood or other material, having disc ends furnished with metal caps. The caps are slotted to receive pins, by which they are connected to gearing discs, and a screw serves to secure each cap to the end of the roller. A slot is provided, into which the end of the web is inserted, and thereby secured on the roller. The receiving roller is turned in one direction to wind on the web by a key fitted to the end of its spindle, a pawl and ratchet serving to prevent its rotation in the opposite direction. A disc, having a notch in it with which engages a catch upon a lever, serves to stop the movement of the rollers and other parts of the apparatus when a length of the web has been drawn off equal to the length of negative exposed. To prevent the catch engaging the notch in the disc when the apparatus is prepared for action, a lever is provided, having at its end a catch arranged to cause the disengagement of the first lever at a given moment. The lever first referred to has a notch wherewith engages a hook forming the opposite end of the second lever.

A counter is placed at the centre of the apparatus, and serves to register the number of negatives exposed and drawn on to the receiving roller. This number, which is indicated on a dial, is seen through a glazed opening in the cover of the box.

A ratchet for actuating the counter is operated by a rod and pawl. The several parts are operated by a push button or knob.

The supply roller is kept stationary by a jointed catch engaging a ratchet on it, and is operated by a rod or lever. A brake is fitted to bear on the supply roller and control the speed at which the web is unwound, regulation of the pressure of the brake being effected by a screw.

At the end of the lever first referred to is fixed a needle, which pricks the sensitive web to mark off the negative after each exposure.

The operation of the apparatus is as follows :—In order to wind on to the roller that portion of the sensitive web that has been exposed, the operator presses the knob, whereupon the lever turning on its pivot is moved a short distance, and is held by a hook. The operator may then turn the receiving roller, and thus bring into position for exposure a fresh portion of the web equal to the length of negative exposed. During this operation the lever, acted on by the knob, is automatically disengaged from the hook by the oscillation of the second lever, which is acted on at its end by a wyper. A projecting catch enters a notch in a disc, and stops the operator when the supply roller is stopped. By this time the web has traversed the entire length of the frame. The levers have then returned to their normal positions, and the operator has only to press the knob a second time and turn the roller to obtain a second negative, and so on until the supply of sensitive web on the roller gives out. The supply roller may then be replaced by one containing a fresh supply of the sensitive web, and the filled roller replaced by the empty one.

The construction of the interchangeable rollers permits of the replacing of the supply roller without having recourse to the use of a dark room. At the end of each web length is fitted a black or darkened strip, which, when the supply roller is put in place, covers the sensitive web and prevents the action of light upon it, and a like strip at the other end serves to cover the exposed web.

To prevent access of light at the edges of the sensitive web a narrow darkened border is formed on each side.

[As some of the items in the special claims attached to the complete specification were long previously published, a disclaimer will be necessary in order that this patent may be maintained.—Ed.]

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
August 29	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 29	Rossendale	Townsend-chambers, Rawtenstall.
,, 30	Lancaster	Storey Institute, Lancaster.
,, 30	Leith Amateur	
,, 30	Warrington	Museum, Bold-street, Warrington.
,, 31	Bath	Roy. Lit. & Sc. Inst., Terrace-walks.
,, 31	Burnley	Bank Chambers, Hargreaves-street.
,, 31	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
September 1	Brixton and Clapham	Gresham Hall, Brixton.
,, 1	Leeds Photo. Society	Mechanics' Institute, Leeds.
,, 1	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 1	Oldham	The Lyceum, Union-street, Oldham.
,, 1	Tunbridge Wells	Mechanics' Inst., Tunbridge Wells.
,, 2	Bristol and West of England	Rooms, 28, Berkeley-sq, Bristol.
,, 2	Cardiff	
,, 2	Croydon Microscopical	Public Hall, George-street, Croydon
,, 2	Holborn	
,, 2	Leamington	Trinity Church Room, Morton-st.
,, 2	Maidstone	"The Palace," Maidstone.
,, 2	Richmond	Greyhound Hotel, Richmond.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

AUGUST 23,—Technical Meeting.—Mr. J. Traill Taylor in the chair.

Samples of amidol (the new developer) and of Richards' patent corners for securing photographs to the corners of albums were placed on the table.

PORTRAITURE OTHER THAN IN THE STUDIO.

In introducing this subject, Mr. J. NESBIT observed that, in taking portraits out of doors, the art of the retoucher was necessary. He had found that in portrait work done with a rapid symmetrical lens he got much detail and very sharp definition. He did not like to take such photographs unless the definition was clear. He took photographs as he saw them with his eyes, and not in the blurry manner now prevalent. He thought it a mistake in photographs of whole-plate size or less to have them at all blurred. He could not see the value of blurriness. Mr. J. Nesbit then passed round a series of outdoor portraits of the Chairman, Mr. C. Ray Woods, Mr. Cowan, and other gentlemen, drawing special attention to two portraits of Mr. E. Dunmore, one untouched, the other retouched. In reference to the latter, which Mr. E. Clifton had kindly printed in platinum for him at very short notice, Mr. Nesbit observed that the retouching had been skilfully executed by Mr. Redmond Barrett in a very short time. Mr. Barrett had made his name not only as a writer but as a demonstrator and retoucher. In the untouched portrait of Mr. Dunmore the corrugations were painful to see, whereas the retouched portrait was a very pleasing and successful one. Outdoor portraiture necessitated more retouching than studio portraiture, especially if such lenses as Ross's rapid symmetrical were used—those gave such wonderful definition. He had opened out such a lens so as to make it practically a portrait lens. In reply to the Chairman, he said the aperture would then be about *f*-6. The photographs he exhibited were taken in the angle of the walls of the back part of his house.

Mr. J. WEIR BROWN had recently attempted indoor portraiture, and exhibited some specimens taken in an ordinary room. The sitter was placed near a double window, half of which was partly stopped out by the blind, the light streaming through the other window at an angle of forty-five degrees, a white fabric being used on the shadow side as a reflector. In reply to the Chairman, he said he avoided the light spot in the eye by controlling the angle of light.

Mr. CHAPMAN JONES remarked that he never found the secondary light spot appear.

Mr. W. E. DEBENHAM described the most favourable conditions for outdoor portraiture, the sitter being placed with his back to a house, with a wall at the side. Such an arrangement gave results which might be taken for studio portraits. He had often taken portraits that way on account of the greater rapidity obtained. For portraiture in rooms, he placed the sitter nearly level with the window, or a little behind it, with a reflector on the shadow side, brought nearly forward to the camera, but not behind it. If behind the sitter, the outline of the head would be lost. For Rembrandt effects, he would place the reflector further back. Mr. Debenham exhibited a number of indoor portraits, chiefly of invalids, taken in the manner he had described.

Mr. T. SAMUELS asked whether the reflector should be inclined or perpendicular.

Mr. DEBENHAM replied that he generally placed it perpendicular. Using a plain white material, the angle was immaterial.

The CHAIRMAN described Solomon's system of indoor portraiture in a tent, with [illegible] as the illuminant, and said that in trying it he obtained flat results. He described the system by the aid of the blackboard. A method which gave admirable results was to place the sitter in front of a window, and photograph him from the outside. The Chairman concluded by referring to the system of employing a mirror to reflect the image of the sitter, and photographing that, describing the effects of lighting obtainable as very beautiful, and recommending it as a good system of indoor portraiture.

Mr. T. R. DALLMEYER said that Mr. Debenham, in stating that the alteration of the angle of a dead surface produced no alteration in the light reflected, was wrong. The same law with regard to the reflections from polished surfaces was followed, the difference being one of degree. Mr. Debenham said that it made no difference, but he (Mr. Dallmeyer) asserted that it did, and that was the point.

After further discussion on this point the meeting adjourned.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 18,—Mr. F. A. Bridge in the chair.

Mr. Percy E. Marshall, of 36, Victoria-street, S.W., was elected a member of the Association.

Mr. Beckett passed round a negative, one half of which was badly fogged, the other half quite clear; the result was considered remarkable, and he promised to bring the exact formula to the next meeting.

A question was asked as to whether a reply to a question in one of the photographic journals was correct. The reply was to the effect that eikonogen with carbonate of soda *would* successfully develop a wet-plate negative.

Mr. T. BOLAS said the reply was quite wrong; such a developer used for wet plates would precipitate the silver right away.

Mr. W. P. DANDO then opened the discussion of the evening on *Stereoscopic Photography*. He read a paper [see page 552], and passed round many prints and transparencies.

Messrs. G. W. Atkins and T. E. Freshwater also passed round stereoscopes and prints.

In the discussion which followed, Mr. DANDO said he could not agree with Mr. Chadwick that stereoscopic pictures should be no higher than the regulation size.

The CHAIRMAN, with regard to the distance between the lenses, stated that Mr. Nesbit, a great authority on such questions, had advised two and three-quarter inches between the lenses as a good average distance.

Mr. BIRT ACRES thought that the separation of the lenses to exaggeration had been the means of bringing stereoscopic photography into disrepute. When taking near pictures, such as flowers, &c., he thought that the lenses should be brought closer together, and he thought also that the lenses used should match, in the distance between, the lenses used in the stereoscope. He showed a stereoscope of his own invention, which, however, he had not quite perfected.

Mr. W. E. DEBENHAM referred to an instrument he had "re-invented"—the tele-stereoscope. He thought there would be great advantage in examining distance stereoscopically, and also for use in military operations. He thought also that the distance *between* the two eyepieces could be altered at will.

North Middlesex Photographic Society.—August 22. In the absence of Mr. Wall, Mr. Walker took the chair.—Forty-five members and friends were present. The Chairman introduced Mr. DEBENHAM, who addressed the Society upon the subject of *Transparencies by the Carbon Process*. He recommended that the tissue should be bought unsensitised, and sensitised as required by this formula: Bichromate of potassium, 1 ounce; ammonia, 1 drachm; water, 30 ounces. Or, if the tissue had to be kept for some time, it would be well to increase the water to 40 ounces. About three minutes' soaking would be sufficient. It should then be squeegeed on to a plate of glass (into the pores of which talc had been thoroughly rubbed), dried, and stored for use. It would strip with a bright surface, which would lie in close contact with the negative. He recommended, as an actinometer, that a negative of medium density should be taken, and, while the carbon print was being made, that a print on silver paper should be made through a small opening in a mask. He emphasised the necessity of a safe edge to the carbon print, and that the cut-out mask for that purpose should be placed outside the negative instead of between the negative and the tissue. By this means the safe edge would be vignetted off instead of showing a hard line, and there would be less risk of frilling in developing the print. It was necessary that the print, when placed in the cold water prior to development, should be squeegeed on to a sheet of glass before it had absorbed all the water it was capable of holding, otherwise it would be unable to take up the film of water on the glass, and close and permanent contact would not be made. Mr. Debenham illustrated his lecture by diagrams on the blackboard and by passing round transparencies, &c., in various stages of progress. He then proceeded to develop several prints, calling attention to the precautions necessary to secure good results. Many questions were asked and answered, and a vote of thanks was moved by Mr. MARCHANT, who said the Society was indebted to Mr. Debenham, and to the Affiliation Committee of the Photographic Society of Great Britain, who had made the arrangements for the interesting and practical demonstration just delivered. Mr. COX seconded the motion, which was carried with acclamation. The usual competition of views taken at field-days was held, the vote of merit being secured by Mr. A. G. Hewson, for West Hampstead. A large number of plates, kindly sent by the Paget Company, were distributed, each member present receiving a packet. Attention was called to the Hill Norris dry-collodion plate, particulars of which had been received. The next meeting will be held on September 12, when Mr. H. Smith will take the chair, and Mr. Beadle will demonstrate the making of lantern slides on various plates. Visitors welcome.

Hackney Photographic Society.—August 16, Mr. Beckett in the chair.—Messrs. Salmon, Dando, and Nunn showed prints on the Ilford P.O.P., samples of which had been sent. In every case satisfactory results had been obtained, Mr. DANDO stating that the bath he had used for toning was: Hypo, 1 ounce; alum, 6 drachms; water, 8 ounces. Let stand until properly dissolved, shake up, then add, in small quantities at a time, a solution of three drachms of carbonate of soda (crystals) in one ounce of water. Filter, let stand for a day, then add 1 grain of chloride of gold and 2 grains of acetate of lead (previously dissolved in 1 ounce of water). Printing must be carried on to a rather deep colour. Mr. ROBERTS said he had obtained a brick-red colour in print by printing in sunlight. The CHAIRMAN said that Mr. Welford had given a good formula for toning bath, consisting of 6 ounces of water, 4 grains of gold, 1½ drachms of bicarbonate of soda. This would tone fast or slow, according to quantity of water added. Mr. Debenham had stated that the more gold used in toning the greater chance there was of permanence. Mr. HENSLER showed results on Paget's plates. He had been troubled with splashes on them. The CHAIRMAN said it looked as if hypo had been the cause. Mr. Hudson presented the Society with several old journals. Mr. FOULSON asked: Would sulpho-pyrogallol be fit to use after two years? The HON. SECRETARY said he had used some which he had had about that

period, and which had given good results. Mr. Bynoe then showed Messrs. Beck's new hand camera, the "Freda." Cut films were used, and forty could be used in the camera without holders. Mr. Fitch had made films for them which would keep as flat as glass. The camera was small and compact, and was much appreciated. Mr. BYNOE then showed his own invention of printing frames. There was no shadow in printing, and, in answer to the Hon. Secretary, said prints could not possibly shift. The discussion on the stereoscope then was resumed, and, on the question of pairing lenses, Mr. BYNOE said an expert was required to do it. The CHAIRMAN had found colours blend very well by one picture being printed differently to the other.

South London Photographic Society.—August 15, the President (Mr. F. W. Edwards) in the chair.—After the announcement of additions to the library, a N. and G. aluminium blind-shutter, now being placed on the market, was shown by the Hon. Secretary, the working of which was much admired, exposures of one-fiftieth to the second being obtained by setting an index finger. Time exposures can also be obtained. A celluloid focussing screen, of the thickness of ordinary glass, which Messrs. Newman & Guardia are now fitting to cameras, was also exhibited. Mr. H. G. BANKS, one of the Vice-Presidents, then read a paper on *The Optical Lantern, its Construction and Use*, during the course of which he gave a practical demonstration of the working of the lantern. In order to show the great heat generated when using the oxyhydrogen limelight, a penny was placed in the flame, and in less than a minute a hole was made through the coin. Attendance thirty-two.

Manchester Photographic Society.—AUGUST 11, Mr. J. Schofield (Vice President) in the chair. The leaders of the outdoor meetings presented reports of their several excursions; but, with the exception of Mr. Pogson's to Alderley, they had not been very well attended, owing, no doubt, to the bad photographic weather. Mr. COBLEY opened a discussion on the *Gelatino-Chloride Printing-out Paper*. He said he had been well satisfied with the paper when first introduced, but latterly had found a difficulty in obtaining good tones. He asked if others had met with similar results, as he feared it was some defect in the manufacture. Other members had been troubled in the same way, and it was considered rather unfortunate that these defects should occur in a paper which otherwise gave good results, and no doubt the makers would endeavour to avoid the faults complained of in future batches. Mr. H. V. LAWES exhibited a twin-lens hand camera which he had altered to suit his own ideas of what a hand camera should be, namely, easily focussed, visibility of the subject when the exposure was being made, and certainty of the shutter "going off" when required. A number of prints showed his successful manipulation. He incidently remarked that for developing the Paget plates he used the following formulæ:—Solution A: Eikonogen, ½ ounce; sodium sulphite, 1½ ounces; hydroquinone, 60 grains; potassium bromide, 8 grains; water, 30 ounces. Solution B: Carbonate of potassium, 1 ounce; water, 10 ounces. For use, 1 ounce of A to 3 ounces of B. Mr. EVANS also showed and explained his hand camera, made by himself to suit his own requirements. The construction was ingenious, each plate being contained in a separate groove running from the reservoir at the top of camera to the exposing chamber. A slide between the reservoir and chamber permitted any one plate to fall in position, the front part of camera being adjustable so as to always retain the same relative distance between lens and plate. By having a focussing glass in the end groove the focus could be obtained before admitting the sensitive plate. Mr. H. WOOLLEY gave a hint as to packing exposed plates when away for any length of time. He had found that labels on the envelopes containing his exposed plates had imprinted themselves on the negatives, owing, he had little doubt, to pressure having been applied to the packets of plates, the sensitive film being affected on the part subjected to the greater pressure where the labels intervened between the plates. The Paget Prize Plate Company sent a number of samples for distribution to the members for trial.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

A LETTER FROM MISS CATHARINE WEED BARNES.

To the EDITOR.

SIR,—Will you kindly allow me the use of your pages for an open letter to my editorial *confrères* and photographic friends in Great Britain, both professional and amateur? It is impossible for me to express individually my keen appreciation of the consideration and courtesy shown at the Edinburgh Convention and elsewhere. Let me, therefore, publicly thank each and all; and I assure my fellow-workers who may favour us with a visit next year of a warm welcome and a fitting recognition of their high position in the art-science of photography. I cannot with a clear conscience delay longer this pleasant duty of returning thanks, trusting all will be able to read between the lines that which I find it difficult to put into words. Let me also acknowledge the valuable advice and practical assistance received, which has done so much to smooth my photographic pathway. Thanks are due, in addition, for cordial hospitality, which cannot be forgotten. To yourself, and to each and all who have been thus kind, let me again tender my sincere thanks.—I am, yours, &c.,

August, 1892. CATHARINE WEED BARNES.

[We are happy to be the means of conveying Miss Barnes' graceful thanks to the photographic public, among whom she is, and has been, a most welcome guest.—ED.]

ADJUSTMENT OF HAND CAMERAS.

To the EDITOR.

SIR,—As Hon. Secretary of a Photographic Society, it has been my duty from time to time to examine and report upon various hand cameras. As my experience with some of these may be useful to both manufacturers and users, perhaps you may consider the following notes worthy of insertion in your valuable JOURNAL.

Quite recently I had a somewhat high-price camera sent me by an eminent firm of manufacturers, with a request that I would show it before the Society, test it, and report on it. After having made myself acquainted with its design and method of working, which were admirable both as regards compactness, simplicity, and efficiency, I charged the magazine and sallied forth to fire off the necessary shots.

So far all went most satisfactorily, and my favourable opinion of the camera was fully maintained.

On developing, however, troubles began, each one of the negatives being hopelessly blurred in foreground, middle, and distance, showing that no part of the picture had been in focus. There was no appearance of shaking, and when looking into the matter I soon discovered that the lens was about a quarter of an inch out of focus. The camera had adjustable focus; however, instead of the lens being in focus for distant objects when brought right back, and having movement *outwards* only for near objects, in this case there was also a totally unnecessary *inward* movement of the lens, which latter caused the blurring, the lens having been pushed right back on the assumption that that was its proper place for distant objects, there being no indication to the contrary.

As this experience of hand cameras is by no means new to me, and, I believe, of altogether not uncommon occurrence, I venture to suggest that makers should have each camera carefully examined by a competent and conscientious man to ascertain:—

1st, That the lens of the fixed focus camera really gives a sharp image on the exposed surface.

2nd, That the lens of adjustable focus camera is properly in focus for distant objects when pushed right back as far as it will go, and that the focussing scale for nearer objects be accurately marked, and the pointer correctly placed.

3rd, That the finders should accurately represent the view given by the lens on the exposed plate, and that truly vertical and horizontal lines should be drawn on the ground glass of each finder to assist when photographing buildings and other subjects having vertical or horizontal lines.

4th, In the design of all magazine cameras I think provision should be made to prevent the possibility of continuing the changing after all the plates have been exposed; the last plate should, after exposure, be properly protected so as to prevent its being exposed twice.

These points would appear to be almost too obvious to require emphasising, but the fact remains that errors do occur, and probably under the most aggravating circumstances. I believe, therefore, that too much care cannot be bestowed in the first instance on these essential points, and, if carefully attended to, much discontent with hand cameras, in every other way admirable, would entirely disappear.

I do not, of course, claim that my remarks apply to every manufacturer, or to every camera; but I do assert that even the name of a firm of repute is not always a guarantee against errors of the kind mentioned. My advice, therefore, to every photographer who buys a hand camera to take with him on his holidays is, that he should on no account leave home without having first by actual test ascertained that the camera is in every respect correct and capable of taking sharply on the plate the views shown in the finders. By taking this precaution he may save himself much disappointment and annoyance when the day of development comes.—I am, yours, &c., L. S. F.

August 19, 1892.

THE COMBINED TONING AND FIXING BATH.

To the EDITOR.

SIR,—I made up to-day a combined toning and fixing bath for chloride prints as under:—

Tungstate of soda	190 grains.
Sulphocyanide of ammonia	250 ,,
Hyposulphite of soda	2400 ,,
Acetate of lead	7½ ,,
Distilled water	20 ounces.
Chloride of gold	15 grains.

I added ingredients in order given, and all went well till I added the gold, when a dark, red-brown deposit was thrown down. What is this?

I have filtered the bath and got rid of this deposit. Is the bath affected in any way? I have made up this bath hitherto by adding the gold first, and have never found any deposit.—I am, yours, &c.,

Horsham, August 22, 1892. BERNARD LINTOLL.

[The deposit is, doubtless, gold. Add the hypo before the gold, and, on the appearance of the red precipitate, shake the solution well when the deposit will, in all probability, be redissolved.—ED.]

PERMANENCY OF GELATINO-CHLORIDE PRINTS.

To the EDITOR.

SIR,—In reply to Mr. R. Wilson, with equal care, I think gelatino-chloride quite equal to albumen in all the points he mentions, and that a greater variety of tone is obtainable than with the ordinary ready-sensitised albumen papers. As to permanency, I do not know any method of working albumen paper by which I can obtain a print that will bear the test to which I put the gelatino-chloride print. With equal care in working I should expect the gelatino-chloride to stand the test every time.—I am, yours, &c., H. G. M. CONYBEARE.

The Hut, Ingatestone, August 22, 1892.

HAND CAMERAS.

To the EDITOR.

SIR,—My BRITISH JOURNAL OF PHOTOGRAPHY only reached me yesterday. My idea for the decline in use of hand cameras is, unless you have perfect sunshine, with snap shots nearly all are failures. I have to my Kodak a shutter of my own make, which will work at any speed. I purchased of Park, the stand-maker at Haggerston, a self-adjusting tripod stand which is always at dead level. Upon this I place the camera, and expose to subject. There is nothing to regulate; the whole thing is done in less than a minute, and you are away before being noticed. I can now secure nearly every picture, where before most of them were under-exposed. What used to be disheartening is now a pleasure.—I am, yours, &c.,

Sutton, Surrey, August 19, 1892. WILLIAM GOODE.

THE DECAY OF PROFESSIONAL PHOTOGRAPHY.

To the EDITOR.

SIR,—I beg to thank you for inserting the letter of "A Professional Photographer" in your issue of August 12. I am sure it expresses the opinion of a large number of photographers. I think the time has fully come when something should be done to protect the profession generally.

My own opinion is that the dealers have done more than any one, perhaps, to injure the profession. Years ago, when the amateurs in each large town could be counted upon the fingers of one hand, those gentlemen were almost entirely supported by the profession.

When will photographers unite and start supply stores of their own? This could be done, and I venture to believe it will be done in the near future.—I am, yours, &c., A.

August 19, 1892.

To the EDITOR.

SIR,—I begin to object seeing always the amateur thrown into every discussion, and with the addition of the most complimentary adjectives as if bowing to the "almighty," even while complaining of his encroachments upon professionals.

No mention is ever made of the amateur without adding that great discoveries are due to them, and never an addition, however small, is made towards the recognition of any improvement ever made by a professional. Professionals as a rule get very little credit for an invention, while, when one amateur finds anything, the whole crowd of amateurs get the credit for it, and it may be safely said that among the amateurs of this day not one out of 10,000 would be able to add a single item to existing things.

Let us give full credit and glory to the one that makes an improvement of any kind, but another name should be given him that does it than to the 9999 who merely put a few pounds in a hand camera, and go about snapping at everything and anything in sun, rain, or fog.

Please give us a rest (even if not correct English), always raising the amateurs to unusual heights. Let an amateur be what he is. The one that is able to improve on anything, to say, photographically, on the instruments, is more than an amateur, and probably an artist mechanic; and, when the chemical line of photography is improved, that party is certainly more than an amateur, and probably a student and chemist, which most amateurs are not.

Professionals, be professionals, and raise your hearts without always bowing to the amateur. Give due credit and respect to the inventor, but to him only, and don't sprinkle with the same glory 9999 plate-spoilers, even if among them you find an occasional few making by chance some good negatives. Quality remains the exception.

This in answer to some remarks of "F. J. A.," page 542.—I am, yours, &c., A. LÉVY.

Asnières, Paris, August 20, 1892.

DISCOLOURATION OF PHOTOGRAPHS.

To the EDITOR.

SIR,—I should feel obliged with advice on the following troubles I have had the misfortune to have revealed to me after the lapse of about six to ten months, that is, the discolouring of the negative films after the short space above mentioned, which unfortunately renders the negatives next to useless. I may add, that I have from twenty to a hundred negatives to develop each day; so it is to me a serious matter, as I have never had it before when working a different method; but this way is certainly very simple and quick when there is such a quantity to get through in a day, having to develop them in batches. I use a well-known brand of plates, and develop them with pyro and ammonia only, adding bromide.

Having developed a plate, it is rinsed under the tap, and then placed in the alum bath for about fifteen minutes, then rinsed under the tap and placed in the hypo bath for about fifteen minutes. It is then perfectly cleared of all opalescence, and is apparently fixed. It is then put in the washing tank, and washed for one to two hours in fast running water.

Then there is a yellowing of the film. To remove that, I put it in a clearing bath of hydrochloric acid solution; alum, one to twenty. Then from the clearing bath it is "rinsed" (not washed), and placed on the rack for drying, and is everything that can be desired until a few months have elapsed. Then the demon shows himself. It takes its course usually from the end of the plate where it is drained in the coating of the emulsion, as it is generally where the emulsion is thicker, gradually get as deep sherry colour, and goes all over the plate. Is there any way of restoring the negatives so spoilt? The same clearing won't touch it. —I am, yours, &c., FILM FIEND.

August 22, 1892.

NEW DEVELOPERS.

To the EDITOR.

SIR,—In reply to Mr. W. A. Wright, in your last issue, I may say that I have made a number of trials in the direction which he indicates, using for that purpose Messrs. Hurter & Driffield's photometric method. Not having yet received either amidol or metol, the investigation has been kept to ferrous oxalate, pyrogallol, hydroquinone, eikonogen, and para-amidophenol. So far the following points seem clear:—1st, The exposure required varies to some extent with the developer used; 2nd, That minute quantities of bromide in the developer often have a very considerable effect, whilst larger amounts mainly affect the time of development; 3rd, Having ascertained the differences in the action of various developers upon one batch of plates, it by no means follows that with another batch, or make, the results will be similar. This last point shows clearly the cause of the diversity of opinion with regard to developers generally, and also that no table of relative values can be given, except for the particular batch of plates upon which the trials have been made.—I am, yours, &c.,

Red Hill, August 23, 1892. J. STERRY.

CAMERA BACK TURN BUTTONS.

To the EDITOR.

SIR,—Sometimes the invention of a very little thing may prove the greatest assistance. I dare say my experience has often been that of brother photographers—how difficult it is sometimes in the dark room to turn the little buttons that secure the plate and blackened piece of tin in the camera back. Often the buttons get so jammed against the woodwork of the back that it is impossible to move them with the nail of one's finger, and I have had to get out my penknife, which all means loss of time and is disagreeable, especially in a small, hot dark room. My suggestion is that all these little buttons should be made with an indentation in them, something like the slit in the blade of a pocket knife, just deep enough for the finger nail to take a secure hold of the button. There would then be no difficulty at any time at once to move the button into its proper position. Will our camera-makers give my suggestion their consideration? I am sure its adoption would be a boon and a success.—I am, yours, &c., (Rev.) E. HUSBAND.

St. Michael's Vicarage, Folkestone.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Vauneck hand camera "by Watson" wanted in exchange for first-class silver-plated banjo.—Address, W. Walker, Scotholme, Nottingham.

Will exchange Marion's *Practical Flashlight Photography* for two volumes of Humphries' *Lantern Readings*.—Address, T. J. LEHMANN, Photographer, Mold.

Wanted, No. 3 Kodak "pistol," in perfect order, in exchange for gentleman's gold keyless lever watch.—Address, JOSEPH SAUM, 19, High-street, Mold, North Wales.

Wanted, Dallmeyer's cabinet portrait lens, or 12×10 camera, in exchange for safety bicycle, silver-plated parts, balls throughout, solid tyres.—Address, A. J. BAILEY, 35A, Hindon-street, Pimlico.

Mahogany whole-plate bellows camera, three double slides, lens, and folding tripod; No. 3 Ross' wide-angle symmetrical, hand camera, or bicycle.—Address, F. T. DAY, wanted, Photographer, Hendon, N.W.

Gem camera, takes twelve pictures on a quarter-plate, locket or postage-stamp size, four lenses, repeating back, will exchange for quarter-plate instantograph, without lens or shutter.—Address, Dr. FINNY, Norbiton.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

James Jarrett, Keynsham.—*Portraits of T. C. Warner, M.P., Ed. Strachey, M.P., and J. E. Barlow, M.P.*

W. SANDERS says: "Would you say if the word 'photoscope' has been used before?"—Yes; often.

JOHN MCALLUM.—No doubt Messrs. Hopkin & Williams will be able to supply you with chinoline red.

W. BRACEWELL.—There is nothing novel in the tones of the prints or in the method by which they are produced.

COLLODION.—If the emulsion is, as you say, perfect, no doubt varnishing the negatives will get rid of what you complain.

M. C.—Probably the solvents of the collodion had not thoroughly evaporated before the gelatine was brought in contact with them.

TRIGSTOUR.—The subject is very fully dealt with in the ALMANAC for 1888; we have not space enough to repeat the information in this column.

PRINTER.—So far as we are aware, there is no rose-tinted albumenised paper in the market that will bear a prolonged exposure to light without fading.

E. S.—Write to Mr. J. B. Spurge, care of Mr. Clarkson, optician, Bartlett's-buildings, E.C., and he will supply you with particulars of his sensitometer.

SHEFFIELD.—Until the complete specification is accepted, it is impossible to ascertain in what the invention consists, except what the inventor may chose to tell.

"ONE OF THEM."—You do not authenticate your letter in the usual way; hence its non-appearance. We do not take cognisance of anonymous communications.

HORATIO YEATES (Melbourne).—The division screen you describe is in actual use at the present time, being made by Mr. W. I. Chadwick, of Manchester. Thanks all the same.

W. WEBBER (Bristol).—The sample of paper sent seemed right, but there was too little of it to enable us to subject it to such a trial as would warrant us in reporting thereon.

J. W. R.—The platinum will not deposit, and hence it must be precipitated from the solution. By all means keep the platinum cuttings, and treat them with the solutions for recovery.

H. TEO.—Full information regarding the forthcoming Exhibition of the Photographic Society of Great Britain may be obtained of the Assistant-Secretary of the Society, 50, Great Russell-street, Bloomsbury, W.C.

G. B. BRAVERY.—The cheapest process for such a great number would be collotype, but as to actual cost of production we cannot give you any idea. Better get an estimate from a firm of photo-mechanical printers.

HYPO says: "Can you inform me where I can obtain glass etching plates, so that when the etching is completed it can be printed from, like an ordinary negative?" Messrs. Sharp & Hitchmough, of Liverpool, supply such plates, we believe.

PERPLEXED.—In copyrighting the portraits, the person referred to lays himself open to prosecution; but you have no remedy against him, not having registered the picture anterior to the piracy. This, however, will not prevent you from now selling copies of the picture

W. BRAY.—The nitro-cellulose compound, usually paper, employed in the manufacture of xylonite, or celluloid, is not at all suitable for the manufacture of collodion for photographic purposes. The material is not what is known as gun-cotton or as pyroxyline, but xyloidine.

R. RIDLEY.—Two thicknesses of canary medium will be quite sufficient in a lantern with a good size fish-tail burner—that is, with ordinary plates; but if they be orthochromatised with eosine or erythrosine, the medium should be supplemented with a thickness of ruby glass or fabric.

H. W. B.—If the purchaser of the business repudiates you as his servant, and the seller did not give you notice to terminate the engagement, you will, we suspect, have to look to the latter for your salary. Your engagement was with him, and you say you have made none with the new man.

PHILIP NEWMAN.—Your better plan, we think, would be to submit the negatives to some such firm as Messrs. Valentine, of Dundee; Messrs. Frith, Reigate; Messrs. G. W. Wilson & Co., Aberdeen; or Mr. Spooner, Strand, London, who all engage in the publication of photographic views. Thanks for the enclosure.

SILVER.—Both the formulæ referred to will give excellent results if the solutions are carefully prepared. Pure material must be used. The potash is that known as pure by alcohol, and does not explode if dissolved in water. You are probably thinking of metallic potassium. No boiler or battery is, of course, necessary. The streaks you complain of arise from the glass not being chemically clean.

T. WATSON says: "I am going to do some oil-colour paintings, and I should like to do them on some etching like ivory, if there is such a thing, as I think ivory would be too expensive, as I shall sell them cheap. Could you inform me if there is anything similar to ivory, and where I could get it?" The British Xylonite Company, of Homerton, may possibly be able to supply the desired material.

A. MALLETT (Christchurch).—To call a collotype a photograph is perhaps somewhat of a misnomer, the more correct name being possibly "phototype," a term much used abroad. We do not think, however, that there is anything seriously misleading in the words "permanent photographs" applied to collotypes, since the production of the latter depends upon the employment of photography, while their permanency is at least as much assured as that of pictures produced by any other printing process. "Phototype," or "photo-collograph," however, would be a decidedly better name, to use in distinguishing them.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.—Thursday, September 1, Outdoor meeting, Gilsland and Naworth. Leader, M. Auty.

PHOTOGRAPHIC CLUB.—Club outing for Saturday next, Snaresbrook; train leaves Fenchurch-street at thirteen minutes past two. Subjects for discussion:—August 31, *Optical Glass.* September 7, *Enlarging.*

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—September 1, Members' Open Night. 8, *Is there any Adequate Theory of Reversals?* 10, Outing to Greenwich; leader, Mr. A. Haddon. 15, *Various Printing Processes,* Mr. B. Foulkes Winks. 22, *Photographic Limits,* paper by Miss Catharine Weed Barnes, of New York.

THE results of the examination in photography by the City and Guilds Institute have been made known, and we note that the Polytechnic School of Photography again sends up the recipient of the highest honour. Mr. S. J. Beckett, a student at the course held by Mr. W. E. Debenham at the Polytechnic Institute last winter, has gained the silver medal and first prize in the Honours department, and three students from the People's Palace, under the tuition of Mr. C. W. Gamble, so long associated with the Polytechnic, have gained the silver and two bronze medals in the ordinary division.

HACKNEY PHOTOGRAPHIC SOCIETY.—The arrangements for September are as follows:—6, Ordinary meeting. 10, Excursion to Sewardstone; meet at Chingford Station at half-past two. 13, Discussion on Exhibition. 20, Ordinary meeting. 24, Excursion to Hampstead. 27, *A Holiday in the Isle of Man,* W. Fenton Jones. The Society purposes holding the Annual Exhibition at the Morley Hall, Hackney, about the first week in November, on the same extensive scale as last year. The classes will be:—A, Members' work since last Exhibition. B, Members' work before last Exhibition. C, Members' Excursions. D, Portraiture and Genre (members). E, Members' Lantern (six). F, (Open) Lantern Slides (six). G, (Members) Stereoscopic. H, (Open) Stereoscopic. I, (Open) Portraiture and Genre. J, (Open) Landscape and Seascape, &c. Prints may be by any process, direct or enlarged, opals and transparencies excluded. Forms will be ready at the end of September.

ON Thursday last the staff of assistants employed by Mr. W. Barry, photographer, of Hull, held their annual picnic. Leaving the studio in two brakes, about half-past nine, after a very pleasant drive through about the only bit of picturesque scenery and villages the district can boast of, to wit, Westella and Swaneland, the destination, Welton, was reached by noon. Substantial viands and luxuries were provided by the Welton caterer, Mr. Giddy, and then rounders were indulged in amid the verdure and beauty of the dale. Then came the event of the day, the long-looked-for cricket match between the sides "Palette and Brush" *versus* "Hammer and Saw," the former winning easily. This humorous and exciting match put every one into the best of spirits, and the day was deemed to be much too short, as the interval to its anniversary next year is now felt to be much too long. Justice was done by sharpened appetites to the host's ample table a second time, and eventually the setting-out place of the morning was safely regained by half-past nine in the evening, all voting it a capital twelve hours.

A COMPETITIVE Exhibition of photographic work, in connexion with the Bedford and District Amateur Photographic Society, will be held in the Large Hall of the Bedford Modern School (by the kind permission of the Rev. Dr. Poole, Headmaster) on Tuesday, Wednesday, and Thursday, October 11, 12, and 13. The officials are:—President: Rev. H. Victor Macdona, M.A., Hilbre Grange, Bedford. Hon. Secretary and Treasurer: W. E. Ison, Hughenden, River Crescent, Bedford. Committee: Rev. H. Victor Macdona, M.A., (President), *ex-officio,* Deputy Surgeon-General A. H. Beaman, Mr. H. W. Stewardson, Mr. Alexander Kirby, Mr. P. Hill, Mr. Montague Troup, Mr. W. E. Ison (Hon. Secretary), *ex-officio.* The Exhibition will be open to all amateurs, and it is also intended to make arrangements for a special class of photographic work for the members of the Bedford Schools. A series of awards will be granted, which will chiefly be of an honorary character, to the successful competitors. Mr. Andrew Pringle will be one of the judges. The Council will also arrange for a series of popular lectures, illustrated with the oxyhydrogen limelight lantern, during the three evenings of the days on which it is appointed the Exhibition shall be open.

THE CONVENTION GROUP KEY.—*No.* 107 *represents Mr. N. Alker; while, instead of "Bickersteth," No.* 21, *read "Mr. H. M. Hastings."*

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1687. Vol. XXXIX.—SEPTEMBER 2, 1892.

CELESTIAL PHOTOGRAPHY WITHOUT AN EQUATORIAL.

We well recognise the necessity for an equatorial when a time exposure is to be given to a celestial body, as this, in virtue of the diurnal rotation of the earth, passes across the field of the telescope with a rapidity determined by the focal length and power of the instrument; and it has been pointed out in this Journal that, in order to depict some stars which are altogether invisible to the eye, even with the aid of a telescope, an exposure of an hour has been found necessary.

And yet, in the case of some of the more luminous celestial bodies, the amount of light radiated is such as to render quite possible the employment of a drop shutter, by which the necessity for an equatorial is abrogated. We have before us an admirable example bearing out this fact in the form of a telescopic photograph of the moon taken by Professor W. C. Gurley, M.A., Director of the Observatory of Marietta College, Ohio, U.S.A. It measures slightly over three inches in diameter, and is a direct photograph—that is to say, it is direct in the sense of the magnified image having been produced by the eyepiece of the telescope, and not by after-enlargement of the image.

There are two features of interest in connexion with this photograph; the first to which reference has been made, that of its having been taken without an equatorial stand; the second being the sharpness of the picture, notwithstanding that the object-glass was that of a properly corrected astronomical telescope.

We have on several occasions pointed out that when a lens is properly corrected for visual purposes—*e.g.*, as in an object-glass for a telescope—this correction will not serve for photography. In this sense achromatism, or freedom from colour, is different from actinism, which latter term implies the coincidence of the chemical and the visual foci.

There are two methods by which the objective of a telescope may serve the requirements of the photographer. The first is to ascertain by trial the distance at which the sharpest visual focus is situated from the sharpest photographic focus. The objective being of necessity over-corrected, this places the latter, or photographic focus, somewhat behind that for visual rays. We need scarcely say that when once this difference is noted it is a constant one for all distant objects. The second method consists in interposing a ring between the crown and the flint elements forming the object-glass, so as to effect a slight separation of them. This will undoubtedly weaken the power of the concave flint, and make the object-glass actinically correct. As in the former case, it has to be done by trial, for we know of no rule that can be applied that will apply to any or every objective indiscriminately. We are aware that in a few of the more important refractors of the world—the Lick telescope for example—a special crown glass has been provided for photography which is interchangeable with the crown employed for visual examination of the objects in the heavens.

A point of interest here intrudes. Assuming that there is a loss, no matter how small, in the definition obtained in a telescopic image when the photographic plate is placed in the best ascertained position for ensuring sharpness, and which may, as recorded of the Sheepshanks telescope, be an inch beyond the visual point of sharpness, the question arises in the event of the elements of the object-glass being brought, by a ring separation, into actinic correction, what would be the result as regards definition between the photographs produced by these two systems?

We now return to Professor Gurley's photograph of the moon. Although printed on paper, its sharpness is sufficient to bear examination through a magnifying-glass, which is rather surprising when we state that the exposure was not instantaneous (as we recognise the term), but lasted for three-quarters of a second, during which time the moon must have made a sensible angular progression. The object-glass of the telescope is six and and a quarter inches in diameter, and is of great visual excellence. The amount of separation of the components to effect actinic correction was found to be $\frac{9}{32}$ of an inch. A Huyghenian eyepiece of a magnifying power of sixty-five diameters was employed, as Professor Gurley finds it preferable to produce the enlargement in this way rather than by an after-process of enlarging the negative. Of course an extremely rapid plate was used. A 5 × 4 camera was affixed to the eyepiece end of the telescope, and on a partition just beyond the eyepiece was fixed the exposing shutter, actuated by a pneumatic ball. The plate was developed with pyro-soda, the pyro being reduced to one-half the quantity recommended for a normal exposure.

On the subject of photographing by a telescope (and we now mean its application to terrestial subjects) it would be interesting, in an historical point of view, if we could obtain from Mr. B. J. Sayce, or Mr. George Thomas, some details, other than were published at the time, of a telescopic view of *some* subject situated three miles from the camera. This was in 1854 (we quote from memory), and we think it was shown by Mr. Sayce. This goes far, especially in conjunction with Hartnup's telescopic photographs of the moon, taken about the same period, to assign the place of honour to Liverpool as the scene of the first application of the telescope to photographic purposes.

PHOTO-DYEING.

Processes for the production of coloured positives on paper, silk, and other fabrics, by means of the application of a species of dye to the silver image, have long been familiar to photographers, although it is true they have never at any time been extensively employed. Citing, in this connexion, the well-known ferro-prussiate process, which, nevertheless, differs essentially from those methods we have in mind, as probably the simplest way of producing paper or linen positives in colour, we may also note that, by the carbon process, in which a considerable variety of differently coloured pigmented gelatines are used, a great number of pleasing colours are obtainable. These methods, however, do not fall under the description of dyeing processes, with which we now propose to deal, in the hope and belief that they may open up the possibilities of an occasional departure from ordinary methods of positive printing in general use.

As typical of the means formerly adopted for colouring the silver image on fabrics, we will select for outline the following plan, which was in vogue about thirty years ago. Silk was first treated with a solution of gelatine, ammonium chloride, powdered alum, and distilled water, and after being dried was rolled, an operation which was repeated after the surface had been dried and sensitised. The picture was then printed, toned, fixed, washed, and dried in the ordinary manner, when it was immersed in a ten per cent. solution of acetic acid, to which a small quantity of the desired colouring matter was added—for red, eosine, for blue, bleu de nil, being employed, and so on for other colours as required.

Possibly it is not quite accurate to include even the foregoing plan among dyeing methods *per se*, inasmuch as the silver deposit simply undergoes a change of colour—is, in fact, "toned"—the term, perhaps, being more strictly applicable to certain adaptations of the bichromated gelatine process with which the employment of a dye is conjoined. In relation to this department, therefore, of the subject, it is of interest to note that M. H. Fourtier, in a recently published work on *Glass Positives*, has exhumed an old process of M. Charles Cros for the preparation of coloured positives on glass, which has the merit of simplicity in its favour, and the further advantage that, for the preparation of the bichromated surface, a spoiled or light-struck gelatino-bromide plate, or even an old developed negative, may be utilised. In the former case, the silver bromide must be dissolved out of the film, and the gelatinised glass thereafter plentifully washed; while, in the latter, the picture must be removed by a solution of potassium ferridcyanide and hypo, equal care being, of course, observed in the after-washings to leave the gelatine as chemically clean and stainless as possible, plates being selected that have not been passed through an alum bath. The dried film of gelatine is next sensitised on a three per cent. bath of ammonium bichromate for from three to five minutes, and, after the excess of bichromate has been removed, is dried and printed in the frame behind a positive. The plate is then well washed, again dried, when it is treated with a solution of the colouring matter which attacks those portions of the gelatine which swell. Those parts of the gelatine image absorb the colouring matter proportionately to the intensity of the light exerted on them, thus giving a positive from a positive. The excess of dye is next removed by washing, and the picture finally dried. For red, M. Charles Cros recommended carmine, fuchsine, or eosine; for yellow, picric acid or alkaline picrates; for blue, Prussian blue or aniline blue.

More recently, Mons. A. Villain, of Paris, has worked out a photo-dyeing process, somewhat on the lines laid down by M. Charles Cros, and applicable only to textile supports; and it may be remembered that we briefly drew attention to it in our issue of July 1 last. Since then, M. Villain has considerably amplified the practical details of the process; and as, from an inspection of some specimen pictures on linen produced by its aid, we conceive it to be of great possible value as a practicable photo-dyeing process, we shall now place a more complete description of it before our readers, gathered from a communication which M. Villain has just addressed to our esteemed French contemporary the *Paris Photographe*.

M. Villain claims for the process under notice that results in a great variety of tints may be obtained, and that the images are unaffected by light, acids, and alkalies. He sensitises paper or other fabric in a solution of 1000 c.c. of water in which 50 grammes of ammonium bichromate are dissolved, and to which, as a mordant, 5 grammes of ammonium metavanadate are added. The paper is dried at a temperature not higher than 25° to 30° C., the whites being discoloured at anything much greater. The sensitised paper or fabric is exposed under a negative until the details are well out and after the unfixed chromium salt has been removed by repeated washings, is then immersed in a solution of the colouring matter, which is maintained at boiling heat for fifteen or twenty minutes. If, after the dyeing, the whites are impure, either a warm bath of soap and carbonate of soda is used, or a cold solution of lime chloride acidified with hydrochloric acid. The print is completed by washing in (if the lime has been used) a slightly alkaline solution.

The colouring matters which M. Villain employs are chiefly anthracene derivatives, several of which we specified when formerly referring to the process, among them being alizarine red, alizarine violet, blue, and black, each of which affords a variety of tones according to the particular mordant employed, whether in the paper or in the colouring solution. In addition to these, other colouring matters are available, such as gallo-flavine, a product of the oxidation of gallic acid, alizarine yellow, green, and several more, affording an enormous range of tones.

It is obvious that the possibilities of such a process of photo-dyeing to which M. Villain has devoted his attention are very great, while the application and extension of the principle deserve attention. It will be noticed that the intervention of a gelatine film is unnecessary, and that it also differs from the process of M. Charles Cros in not being a direct method of reproduction, *i.e.*, one yielding a negative from a negative or a positive from a positive. As easy means for the production of coloured positives by dyeing, both methods are equally worthy of regard—the one for glass, the other for fabrics.

ONE LENS FOR ALL ANGLES.

We have had an opportunity of looking through an album containing a series of charming photographs—portraits and landscapes, dainty vignetted "bits," broad expanses of champaign embracing a narrow angle of view, and, again, street scenes including a wide angle. The pictures were mounted with taste and judgment, and though all were small—some were even not more than three inches across—yet the whole collection was a veritable set of pictorial gems. From it many lessons could be learnt, first among them the great desirability of cutting a

print down to the exact extent that would satisfy the most exacting critic as to composition and design. It cannot be denied that the practice, encouraged by so many exhibition committees, of fixing the particular size of photographs to be displayed, or, rather, entered for competition, has materially cramped the artistic effect capable of being obtained from a particular negative. We appeal to all who have been judges at photographic exhibitions whether there have not come before them, in the exercise of their judicial functions, very many photographs utterly ruined by the inclusion of portions of subject that offend against artistic propriety, and that ought to have been ruthlessly cut out, even though the view were reduced to one-half the size. But then, if this had been done, the collection would have been disqualified, so that, right or wrong æsthetically, the full tale must be given, the exact amount of square inches reached, if not over-passed. It may be said that the skill of the photographer is shown by the way he places his camera so as just to include what should be included and to leave out what would injure the picture. To a certain extent this is true; but, on the other hand, the possible standpoints are often restricted to a very small area, and, again, no power can expand a view that, for example, cuts up beautifully to a size of, say, ten inches by three to a ten by eight proportion. Hence it is evident that offering a medal, for example, for a set of six 10×8 views must cause either the exclusion of many a beautiful picture or the inclusion of many an unbeauteous accessory or component. It must not be supposed from these remarks that we suggest the abandonment of classes governed by size; neither do we suggest their retention. Our present purpose is to show one of the evil effects brought about by the system, and thus, at any rate, render it open to discussion, and suggestion for means of increasing the elasticity of the rules governing the boundaries of pictures.

These remarks have a further object. Once granted that in the taking of views the principle of having a collection a given number of inches long, and another fixed number broad, is by no means necessary to effect, and is often detrimental to beauty, and the ground is cleared for our main object. Amateurs who take photographs for the mere love of the work, and to produce a photograph which they hope will prove that "a thing of beauty is a joy for ever," form the large majority of users of the camera, and they need not be trammelled by any rules as to size. Those of them who cannot spend much money over their hobby, and who often lose a picture through not having a suitable lens, may value the suggestion that it is quite possible to work with one lens only, and yet obtain views of any practicable angle whatever, from the shot required in street work to the diminished range desirable in many landscape effects. The only condition requisite is, that the actual size of the view is not to be fixed. Two requisites are involved—the use of a reversing back and of a plate of maximum size. Given a camera of the selected size and a suitable lens, all that is requisite is to see that the view to be taken is centrally placed on the plate, and often to make the actual selection of view from the negative itself.

It will scarcely need pointing out that the lens will need to be chosen from the wide-angle class. What will embrace a wide angle will necessarily include a narrow angle. The only objection of importance that can be raised to the scheme is that the general average of size must be small, unless inner frames be used—a plan fraught with inconvenience, and unless plates of such large size be chosen that the cost of plates alone would be a serious item. It is true that to use a 12×10 plate to take, say, an 8×6 view would be wasteful; yet would it not be far better to waste that value of plate rather than risk the inclusion of objectionable features in the endeavour not to "waste" a plate?

The subject is a very large one, and is capable of being argued on many grounds and seen from many standpoints. In an article like the present, brief suggestions only can be made, and we will conclude by giving one or two practical details. If a lens (one of the wide-angle class) be chosen with a focus about two-thirds the length of plate, there will then be an average size of picture taken of length equal to the focus, i.e., two-thirds the length of the plate will be "wasted." A view embracing a very wide angle will need the whole-plate, one including a small angle only (unless one component only of the lens be employed) will only use one-half the length of the plate. Take the commonest size of all—half-plate. If a lens of four and a half inches focus be chosen, the majority of views taken will average about four or five inches; a street view may need all the plate, a landscape might possibly be best cut down to three inches. But what a gain there would be! Far better than a uniform longitudinal space would be the wise, careful, and artistic appropriation of just, and only just, what is needed to compose a picture. Apart from the one-lens question, let some of our readers act upon and report upon our suggestion.

ACCURATE EXPOSURES.

How frequently is the remark heard, in speaking of a negative or photograph, "Oh, that had a second and a half, but a second would have been quite sufficient;" or, again, "I gave that eight seconds in a very bad light, but it would have done with ten." Perhaps, in the case of an "instantaneous" exposure, the statement may be varied to "The exposure was one-tenth of a second, but you see it is overdone; one-twentieth would have been ample." We venture to assert that no such ideas of extreme accuracy prevailed amongst the workers of ten years ago, and, to go back still another decade, such remarks would have been considered absurd, even when due allowance had been made for the different sensitiveness of the plates of that day. The so-called "latitude of exposure" of the dry plates of twenty years ago was far too great to render such trifling variations in exposure of any importance whatever, while even wet plates, which did require a close observance of accuracy, would scarcely, we think, have been seriously affected by similar departures from the exact time, in skilful hands at any rate.

It is very certain that the latitude of exposure of gelatine plates of to-day is not less than it was ten years ago; on the contrary, the change, if any, is rather in the opposite direction, and any of the good commercial brands are more easy to manage, we believe, in the matter of exposure, than was the case at the period we mention. For one thing, some modern plates are, as a rule, if not invariably, more thickly coated with emulsion than formerly, and it stands to reason that a film rich in silver must give an image possessing proper printing gradation more easily than one in which the silver present only just suffices to give printing density under the most favourable circumstances. With a film rich in silver, over-exposure, of a far more serious character than is involved in the remarks we have quoted, only necessitates a longer application of the

developer, with or without the use of an additional quantity of restrainer, whereas the poor, thin film, under such circumstances, produces the flat, unsatisfactory result that gave rise to the term "burnt up." In case of under-exposure, the thickly coated film, by the use of a suitably modified developer, enables the details to be "coaxed out" without rendering the lights too dense; but the poor film, under such treatment, yields nothing but an equally poor image, in which, whatever may be the condition of the high lights, the shadow details possess no printing value.

It was not, however, all the plates of ten years ago that were of the unsatisfactory character we have spoken of, for some of them, although giving apparently much more transparent images, contained fully as much silver as the average modern plate. This transparency of image was due to the nature of the deposit, the bromide of silver being in an extremely fine state of division, in which condition the colour of the negative had much to do with its printing density. On the other hand, when newer methods of emulsification came into vogue—notably the "ammonia process"—the deposited bromide became much coarser, and it was then that poverty of film began to be felt. We do not refer to the ammonia process as being the only one that gave coarse and poor films, for the same result occurred from over-boiling, as well as in the different precipitation methods that were tried, but none of which ever came into general use. It was the struggle after extreme sensitiveness combined with the attempt to economise that gave rise to the class of plate that was deficient in "latitude," for such films when tried in the laboratory with the sensitometer, a standard-camera exposure, or under a negative at a fixed distance from a gas flame of tolerable uniformity, might give a satisfactory result, the exposure being a "correct" one, and yet altogether fail in the studio or field from the inherent want of latitude.

But with ordinarily good plates we have made equally good negatives from very varying exposures. On one occasion half a dozen plates came into our hands for development, all having been exposed upon the same subject, which was required for a special purpose, and, in order to secure at least one negative, each plate had received a different exposure, these varying in value from one to about six; but, unfortunately, the memorandum of exposures was lost, and we had no information whatever upon that subject; nevertheless, each plate produced a good negative, and it was impossible to say with certainty which had received the longest and which the shortest exposure. A similar result occurred on another occasion, when, with a view of giving a lesson in development, we exposed a series of plates for periods varying from one to ten; but in development we instinctively treated each plate in the best manner to produce a negative with a precisely similar result, and, although our lesson may have been useful, so far as it showed the possibilities of "latitude," it signally failed in demonstrating, as we intended to do, the peculiarities of over and under-exposure.

One more example will show the practical utility of latitude of exposure. Dealing with plates of such different degrees of rapidity as ———'s "Instantaneous," and the same maker's "Ordinary," we on one occasion went out with some of each kind in our slides, and carelessly exposed the "instantaneous" for the slower ones, giving the more rapid exposure to the latter. Thanks, however, to their elasticity in exposure and development, aided, no doubt, by our invariable practice of not cutting the exposure, every plate that day produced a good negative; it is needless to say we discovered the mistake on arriving home, and treated each plate accordingly.

As we have already remarked, there is not the slightest reason to believe that our modern plates are in any way inferior to those of earlier years in their capacity for meeting wide variations in exposure. Why, then, this supposed necessity for such extreme accuracy? The difference between one second and one and a half is an increase of fifty per cent., but this in comparison with one to ten is a mere nothing, yet many operators at the present day profess to find it produce an appreciable effect on their results. We have little hesitation in ascribing the cause to the introduction of "one-solution" developers and exposure meters, both of which, though useful in their way, are calculated to reduce development — scientific development—to the position of a lost art.

The one-solution developer, incapable of any modification beyond mere dilution, necessarily requires a closer adherence to some limits between which the exposures are made, or, in other words, entails greater accuracy. This in its turn entails in inexperienced hands the adoption of some instrument or method by which the exposure can be correctly estimated, and, when this is available, "one-solution" developers become thoroughly practical, though photography then becomes a merely mechanical process, and automatic development a fact. But, since the perfect "exposure meter" readily available for outdoor use has still to be invented, the fact that so many good results are obtained with fixed developing solutions argues rather in favour of the latitude of the plates than of the power of such a developer to meet all requirements. Where the "one solution" is employed, however good the plates, some little care must be exhibited in timing the exposure; but even then it is somewhat ridiculous to make a parade of a non-existent necessity for extreme accuracy. When it is alleged that a single second would have produced a better result than a second and a half, if the negative really show signs of over-exposure, it is more than likely, even with a single-solution developer, that a quarter of a second would have been nearer the absolutely correct mark.

These single-solution developers are undoubtedly useful under certain circumstances—that is to say, when the exposure has been within measurable distance of the "correct," whatever that may mean; but they are seldom of much avail when, from accident or necessity, more than usually wide departures are made from the normal, as in cases of accidental over-exposure in an excessive degree, or in photographing very rapidly moving objects. Then—and, indeed, for all classes of work—nothing has yet appeared in the shape of a developer than can compare with pyro and ammonia intelligently used; others of the newer developing agents, when used with varying proportions of alkali and restrainer, give a certain amount of power in varying the result; but none as yet come up to pyro, with which it would be utterly absurd to talk about a variation of fifty, or even a hundred, per cent. in exposure producing such an effect as is claimed by some.

In conclusion, we would strongly urge those who would thoroughly understand the theory as well as practice of development, and at the same time secure the largest proportion of successful exposures, to eschew single solutions, and to adopt, if not the ten per cent. system, at least one that will permit of the modification of the developer according to circumstances. Otherwise, the fancied necessity for extreme accuracy in exposure will undoubtedly become real, and one of the greatest powers of development absolutely lost.

The Eastman "Solio" Paper.—We understand that the Eastman Company intend for the future to call their gelatino-chloride paper by the name of the Eastman "Solio" Paper.

Heat and Photo-mechanical Work.—The intense heat of the past month, both at home and abroad, caused many inconveniences in the practice of photography. Studios, particularly those of the old "glass-house" type, have been almost unbearable, alike to sitters and operators. Great as was the heat here, it was still greater on the Continent, where, we are informed, some of the largest photo-mechanical establishments, whose work is dependent upon bichromated gelatine, were compelled to suspend operations entirely for a great portion of the month. With the thermometer at or about 100° Fahr., the successful dealing with bichromated gelatine in any form becomes next to an impossibility.

Definition in Portraiture.—Mr. J. Nesbit's defence of good definition in portraiture, delivered the other night in the course of some remarks on outdoor portraits before the Photographic Society of Great Britain, was supported by the cogent argument that he took such portraits as he saw them—that is, clearly defined—and not in the blurred manner now prevalent. No simpler, and at the same time more powerful, defence of sharp, or, at least, good definition in portrait photographs could, in our opinion, be adduced. It is only rational to suppose that such pictures should in the prints appear not less sharp than the eyes see the original, so that, if all modern photographers take portraits in the manner of Mr. Nesbit, it clearly follows that blurriness is, after all, a defect of the vision, and not due to any inherent objection to good definition *per se*. Some experiments on the eyesights of photographers who favour out of focus would be very interesting.

The Value of Retouching.—At the same meeting Mr. Nesbit paid a deserved tribute to the value of retouching under certain circumstances. He exhibited two portraits by himself of Mr. E. Dunmore taken with a lens of the rapid symmetrical type, the untouched one showing the corrugations of the face in a painful degree. In the other one these corrugations had been rapidly and skilfully removed by Mr. Redmond Barrett, Mr. Nesbit remarking that the result was most pleasing, and others testifying to the excellent manner in which the likeness had been preserved. Evidently, with outdoor portraiture, the services of a retoucher are not only useful, but, more often than not, are of positive necessity.

Intensifying "Blue" Prints.—Captain Himly recommends, for imparting greater intensity and brilliance to blue prints, an immersion in a solution of a ferric salt—perchloride of iron, for example—of a strength of five per cent., the prints afterwards being well washed.

National Association of Professional Photographers.—Continuous efforts are being made by the executive of this Association to induce professional photographers to take up membership in order to further those objects in which the profession as a whole is vitally interested, such, for example, as the revision of the law of copyright, relations with manufacturers, the right to the negative, and so forth. We are constantly publishing letters ventilating professional photographers' grievances, which, we may point out, would possibly be the sooner redressed if united action were taken. Hence our suggestion to these and others to join the National Association, whose Secretary, Mr. D. J. O'Neill, of 47, Charlotte-street, Birmingham, will be happy to forward full information and particulars. As we stated on a former occasion, the next annual meeting of the Association will probably be held in London some time during the Exhibition of the Photographic Society of Great Britain.

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

As already announced, the Exhibition of the Photographic Society of Great Britain will open on Monday, September 26, and remain open until November 10, being inaugurated by the usual *conversazione* on Saturday evening, September 24. Medals will be placed at the disposal of the Judges for the artistic, scientific, and technical excellence of photographs, lantern slides, and transparencies, and for apparatus. The Judges are Messrs. F. P. Cembrano, jun., W. E. Debenham, W. England, F. Hollyer, and J. Traill Taylor, with, as scientific experts, Captain Abney and Mr. Andrew Pringle.

Entry forms, which may be obtained of the Assistant Secretary, Photographic Society of Great Britain, 50, Great Russell-street, Bloomsbury, W.C., should be sent to him by post on or before Tuesday, the 13th inst., or delivered with the exhibit on the following day at the Exhibition Gallery, 5a, Pall Mall East. These particulars may serve to answer numerous inquirers who have written us in reference to the latest date for sending in exhibits, ample time, it will be observed, remaining for that purpose.

We anticipate an Exhibition in no degree, as regards excellence and number of exhibits, inferior to any of its predecessors, and are confident that it will attract the support of all who are sincerely desirous for the advancement of photography. The American exhibits are already more numerous than hitherto.

CONVENTION JOTTINGS.—VI.

A Run through Some of the Scotch Studios.

MARSHALL WANE (Edinburgh and Ayr).

Our next visit was to Mr. Marshall Wane's studio in George-street, Edinburgh. Before coming to Edinburgh Mr. Wane held a world-wide fame as a first-class photographer in Douglas, Isle of Man; at that time for large, direct pictures he pretty well took medals at every exhibition that he entered for competition, and, to our knowledge, from his studios have emanated artists that now broadcast fill first positions in the highest-class businesses in the profession. Seeking a larger and more extended centre for the prosecution of his business, Mr. Wane selected Edinburgh as a likely venture, and selling out a business that had increased to considerable dimensions for the size of the place—viz., Douglas—he came and settled in the capital of the North.

Within the last three years he has further extended and opened a charming studio at Ayr, a favourite summer resort.

The Edinburgh place, as can be well understood, is one of the best of its kind, the entrance-way and showrooms being hung with specimens of his usual fine work; prominent amongst these are pictures highly finished in water colour, which is a large and profitable part of his business, large portraits in oil also being considerably in demand, whilst platinum, bromide, and carbon works come in for their full share of attention.

Those who visited the Edinburgh International Photographic Exhibition will remember the series of large platinum pictures exhibited by Mr. Wane—a collection of pictures that showed great excellence of workmanship, both artistically and technically. As we have said, Mr. Wane was one of the first and most successful photographers that entered the field with large direct portraits—that is now many years ago—but there is no lagging behind even now, for he is ever amongst the first to introduce the latest novelties to his numerous customers.

His showrooms are artistically arranged, the decorations being soft and subdued in tone, and his studio is furnished with backgrounds and accessories of the latest type. On visiting Mr. Wane's Ayr studio, we found it a marvel of completeness, and thousands of pounds must have been expended before such an establishment was so fitted and furnished ready to receive those clients for whose comfort it was enriched and decorated.

These business premises are in a large self-contained house situated in one of the finest terraces in Ayr, one of those select spots where no business is supposed to be conducted, and consequently no specimen cases or advertisement pictures of any kind are on view. In such a place the connexion must be made without the aid of such. All sitters who come to be photographed come with intent, as no indications are made whereby chance customers might be induced to drop in.

The studio and workrooms are built in the garden at the back of the main building, and joined by corridors to the front premises.

The first room on entering is the business-room, which partakes much of the feeling of a country house, and looks business. The

following rooms are showrooms, and we found these fitted in rather a novel way. Broad panel screens running on castors, so that they could be moved to any point or light, are ranged round these apartments, and each of these movable screen panels is tastefully hung with pictures—no crowd or excess of work, but beautiful things tastefully arranged. Behind these rooms is the studio, which has been faultlessly arranged as regards lighting, decorating, and accessories.

From the quantity and quality of the work here turned out, it seemed to us that the quiet of the exterior did not seem to retard the progress of considerable working operations within.

Mr. Yerbury's Studio (3, Hanover-street, Edinburgh).

When in Edinburgh, we had occasion to visit Mr. Yerbury's studio at 3, Hanover-street. Wishing to change some Eastman films, and his place being quite close to our hotel, we, knowing his genial disposition, went up for the use of his dark room. Not having been in his place before, however, we were quite charmed with the appearance of the compact little place, containing as it did the necessary room and appliances for a considerable trade in a compass that needed everything to fit in nicely if the work had to be got through expeditiously, for besides the usual portrait and group work, of which we saw many fine specimens, we found Mr. Yerbury producing opalines, —fishwife photographs and other popular subjects—which are sold as souvenirs, and which he supplies to the shops in the city. In a favoured place like Edinburgh there must be a large demand for such mementoes by the tourist and stranger, and Mr. Yerbury seems to have struck the groove.

His place is composed of two flats, the show and business rooms being immediately below the studio and workrooms flat. All the work is under the personal supervision of Mr. and Mrs. Yerbury.

We were received with great kindness by both, and their extreme courtesy and eagerness to help us will always be a pleasure to think of.

Mr. Warneuke's Studio (Sauchiehall-street, Glasgow).

Being in the north, we made it our business to go further afield than Edinburgh, that queen of cities; so next we betook ourselves to Glasgow, the commercial capital of Scotland, to see what was being done in that metropolis of the west, and here we found, what we have always found on former occasions, everything spinning along with an energy and "go" peculiar to the people and the place—no leisure about them when at their work; they mean business, and look it.

Our first visit was to Mr. W. M. Warneuke, who has now two places running, the one at 127, Sauchiehall-street, this one being the business premises in which he has been located from his start until May, when he acquired another place at 153, Sauchiehall-street, a few doors further up on the same side of the street. He is now going to run both places, the one at 127 under the title of "The West-end Photographic Studio," and the new place as "Warneuke's Studio." The old studio was constructed and conducted on old and familiar lines, but with the 153 premises Mr. Warneuke has made quite a new departure. At the time of our visit the finishing touches were just being put upon it, and very shortly it was to be opened to the public.

The place when he took it had a front shop, with large window and doorway. These he has had cleared away, making an entrance-way equal to the width of both, and in length right in to the stair that leads up to the showrooms. From the street all along this passage-way the roof and uprights are constructed of woodwork, all wrought in the fancy checked Alhambra patterns and style, looking remarkably solid, yet light and graceful. Both sides of the entrance-way, and reaching as far as the stair, the walls are fitted with plate-glass cases, large and free as windows, where the largest pictures can be exhibited with ease and grace, the uprights between the panes of glass being of the same style and finish as the other Alhambra work, the space between the cases, right and left, being so great as to allow of any likely number of people viewing the contents with ease and comfort, the whole effect of this unique arrangement being "catching" and pleasing to the eye, and arrests attention at once.

The door at the foot of the stairway is also very chaste in design fitted with stained glass, with a large bevelled oval of patent plate fitted in the centres.

On the first landing we reach a large picture gallery, lighted from the top, which has been furnished and decorated as principal showroom. In the way of wall decorations we here came upon what, to us, was quite new. To all appearances, the walls were covered with what seemed to us a brocaded silk damask of a dark greenish-blue colour; but, on closer inspection, we found the surface was oil paints. The effect, which is very pleasing, is, however, produced by first covering the walls with a special kind of white lace curtain in the same manner as you would paper them, and then the oil paint is applied to the surface of the fabric, thus producing the rich, silky effect that arrests the eye.

The pictures hung are artistic, appropriate, and not too crowded. The seats are Turkish ottomans, and the carpet is velvet pile. The woodwork is all of the Alhambra pattern that we have previously noted—in fact, this style of woodwork is carried right through the whole place, including business rooms and studio, and, wherever partitions intervene, these are all fitted with stained-glass windows.

The business and dressing rooms are on the same flat as the showrooms. With special attention to the ladies' comforts, cheval mirrors are to be found in all the dressing-rooms.

Going up another flight of stairs we come to the studio, which is built in an L-shape, the long limb forming the principal studio, which is arranged to be worked at both ends, the short limb of the L forming a small studio with a slanting top front light.

The walls of the studio are covered with the lace oil-painted—same as the showroom—in this case the colour is a greenish old-gold tone. The shutters run in three grooves, as we previously described as being fitted in Mr. Scott's studio, but in Mr. Warneuke's case they are made ornamental by each of them having a pattern and forming a panel. The top blinds are arranged and fitted on metal rollers—guide cords are dispensed with—and by a simple draw a ten-foot blind can be arranged with great ease.

The new American background stands are fitted, one at each end of the studio. Alongside is the Morgan's new vignetting ground and stand; here and there in the studio stand old antique oak cabinets, filled with bric-à-brac ornaments. The other general furnishings and fittings having been carefully thought out and arranged has resulted in so perfect a room, that Mr. Warneuke might be well proud of it.

The apparatus for electric lighting has been conducted into the studio, and stands ready for connexion. He has arranged to get his supply from the Corporation main—it will be some little time before they supply—but, when ready, he has contracted for light equal to 30,000 candle power; quite irrespective of taking pictures, his whole place is to be lighted by electricity.

The printing premises are at the back of the building, and entered from Wellington-street. Collodio-chloride pictures are what Mr. Warneuke favours most, and the tone he prefers and produces is a rich, reddy-brown, very charming to look upon, and which have caught on to the public taste; a taste that is often slow to catch even with the most artistic productions. The large platinum pictures that Mr. Warneuke has been sending out to most exhibitions have made way for him, and extended his popularity and name far beyond local limits. Being no stay-at-home-worker, medals come from all parts, both home awards and from across the seas.

SOMETHING ABOUT SHUTTERS.

The introduction of the new Jena glass lenses, with their flat field of definition at large apertures, changes certain conditions of exposure where it is of brief duration or so-called "instantaneous." Hitherto we have been satisfied with the central shutter in the case of compound lenses, because what was lost in the time required to open and shut was compensated for by the better definition caused by the exposure beginning with a point and ending with the same.

But a radical and insuperable difficulty in this form of shutter is that, during the entire duration of the open and shut action, any movement in the subject affects the impression; and, as this action is a double one, and the exposure is less than the half of that which

would be given by the same lens with the full aperture, being, in fact, only that of an aperture which has the quarter (approximatively) of the full area of the aperture employed, any approach to a minimum exposure is out of the question.

A shutter which operates in the mid-lens position, and does not open in the centre and close there, interferes with the perfect focussing of the image, as any one may see by focussing with the aperture of a rotary diaphragm partially, *i.e.*, eccentrically, placed, half way revolved into its proper position. There is a certain correction in the result, as the opening in the passage from one side to the other commits the same error in both directions, and the effect is only a slight confusion of the image, not enough to be noticed under ordinary circumstances.

The action of a shutter which presents an aperture passing from side to side when placed between the lenses is, therefore, objectionable in theory, and of no advantage in practice That of the form which we may call the guillotine, *i.e.*, in which a slot passes from top to bottom, or the reverse, or from side to side, is not correct, therefore, in the central position. But, if we apply the same action in the case of an exterior shutter, whether placed behind or before the combination, there is an entirely different effect. We do not diminish the illumination of any part of the field, but give the full power of the lens to each part of it, passing rapidly from side to side, with no return, so that we get all the light that is given, which permits each part of the sensitive film to be given a minimum exposure in as rapid succession as may be desired, and no interference with the definition is caused, either for the better or the worse; we simply uncover and cover again, by a progressive movement, the field of view, as it would be seen from the position of the sensitive plate. This is the action of the admirable, and once famous, pantascopic camera of Mr. J. R. Johnson.

With the old form of rapid lenses, whether symmetrical, rectilinear, anti-aplanatic, or other, in which the field of definition was curved, such a shutter gives no compensation for the interference with the equality of illumination by the proportional sharpening of the ray during the greater part of the exposure, and consequent better definition. The introduction of the lenses with a plane field of definition leaves nothing to be gained on that side; for the whole field is in focus on any given plane, and the loss of focus from plane to plane is at a minimum. What is wanted with these lenses is, then, a shutter which goes before or behind the combination, with an opening passing from side to side. The drop shutter is correct in principle, so far as the nature of the exposure is concerned; but it errs in giving the succession from bottom to top, or the reverse, because the motion, which possibly interferes with perfect definition, takes place from side to side (except in the case of falling objects), and the head of a figure passing through the field would therefore be taken before its feet, and, however slight the interval, the figure would be, *pro tanto*, distorted.

Where the time of exposure is largely in excess of that of the action of the shutter—*i.e.*, where the shutter works rapidly and remains open for an appreciable time, as in most landscape work—the central-opening shutter, whether before the combination or between its parts, presents no material objection; but in the former case, in what is called instantaneous action, it exaggerates the central illumination, and in both cases it diminishes the effective exposure as indicated by the time of the action of the shutter.

W. J. Stillman.

AMERICAN WORK AND WORKERS.

[Birmingham Photographic Society.]

In speaking on a similar subject before the recent Edinburgh Convention, I could only venture on a very general treatment of it, so that when your kind invitation to address you was received I decided to speak further on what camera workers are doing in the United States. We draw the lines quite as sharply as in Europe, and have as various species of the genus "crank"; but, after all, little really progressive work is ever accomplished in the world without the workers being looked upon as mentally unbalanced, to state it mildly, by those not possessed of a like enthusiasm. The devotees of the camera must bear their share of this experience, for, in spite of all proof to the contrary, the uninitiated are still unwilling to believe that the results of photography are not due to luck or, at best, a cleverly managed trick. We can well afford to smile at this view, however, realising, as every genuine worker does, the higher position it is constantly assuming among the world's actively beneficent forces.

Hand Cameras versus Stand Cameras.

With us, as more than once stated, the camera is too often considered only as a means to kill time, and the fact is then lost sight of that the so-called snap-shotters possess in their ever-ready instrument a wonderful, though too-often abused, power. But they should not claim for it perfect equality with tripod work. My own preference for the latter is mainly that, as more care is usually given to it, the results are better than hand work, but it seems also as if the former admitted of greater latitude in composition, to say nothing of subsequent treatment of the negative (which when well done is perfectly legitimate, from an artistic standpoint), and—I say it advisedly—the greater choice as to selection of subject it places in the worker's hands. This is without detracting from the use of hand cameras, which form a department of their own, covering an important field, and which should not necessarily conflict with tripod work. In the hands of any one who has gained large experience with the tripod, the hand camera is a valuable power, but with us the latter is usually considered as being easier to manage than the former, is therefore preferred by beginners, and its results cannot justly be compared with stand-exposures.

There is a very amusing amount of ignorance in the land on the subject of shutter-exposures, and the idea seems prevalent that instantaneous work (I dislike the term) is the result of some occult power residing in, and solely due to, the instrument, having nothing whatever to do with the operator. I was asked lately, on the shore of Loch Katrine, where my 8 × 10 tripod camera was being used. "Does your camera take instantaneous pictures?" "That depends on how you use it," was my reply, which seemed to puzzle my interlocutor. With us, as well as here, the camera army is divided into what might be termed "tripods" and "anti-tripods;" but we seldom use one to the exclusion of the other, except among those who do little, if any, really serious work. As long as the average user of a camera is satisfied with playing at photography, he will never consider it is worthy special respect. It should be stated in strict justice that, as a whole, American clubs offer finer working facilities than those of any other country, and are imbued with a progressive spirit which readily embraces every new improvement. Americans are—and I claim it without undue self-praise—not only able, but willing to learn where they make up their minds the game is worth the candle, and a really good idea is certain sooner or later to find general support. We do not hold on to any method or opinion because of proper respect for age, or welcome it because it is young.

One point which to my knowledge has never been considered is that camerists have widely differing gifts in the photographic field. Some do best in the studio, some with architectural subjects, such as interiors, and others with hand cameras. Very few can or should undertake to do all these with hope of equal success. I think one fault with us is that we are apt to attempt this all but impossible task.

American Apparatus.

Let me emphasise one point in favour of American methods, or, rather, instruments, which is to some extent being introduced in England—the question of lighter plate-holders. Englishmen claim that with them bulk is as great a consideration as weight, but to me the point does not seem to be well taken. Our holders may not be as ornamental in appearance as the smoothly polished ones so general here, but they serve the purpose of keeping out light just as well, and the slides are not nearly so inconvenient as the permanent ones which project beyond the camera, and at any moment are liable to cause vibration or to be broken off by a sudden movement of the operator. I must also endorse having the word "exposed" printed on one side of the slide, which, if the operator takes care to replace correctly, positively prevents double exposure. Their use, like most of the other mechanical appliances, requires a certain amount of brains, otherwise common sense. The tripod I am now using, and have for several years, is easily and quickly adjusted, and packs into a small compass, as does the camera, which closes in on itself, thus protecting the lens if a wide angle one, and the hinged ground glass is discarded in favour of one which permits being held back so as to let the plate-holder take its place, and when the holder is withdrawn the glass slips back into position. The tendency is growing to have as few projecting screws or other parts as possible, and those recently made are particularly noticeable in this respect. Opinions differ as to the advantages of front or back focus, being slightly in favour of the former except in the studio and with enlarging or reducing work. Few, if any, of our cameras are made to have the tripod top permanent in the instrument, but it does save room, and the idea is therefore good. We are in serious danger of making our instruments, especially the cheaper grades, altogether too light; but the demand is for portability combined with cheapness, and this leads to an enormous sale of small-size instruments. I have one camera in my large collection which cost hardly twelve dollars—camera, tripod, plate-holder, lens, and carrying case complete, and it does very tolerable work. For some inscrutable reason the small prints in our exhibitions are called the English size, though I noticed in the various excursions at Edinburgh very few

even whole-plate cameras. With you, as with us, the reason is usually given that enlargements are always available, but my preference is always for direct prints.

Uniform Sizes of Plates.

It would seem to be a fitting matter for international arrangement, the coming to some agreement for uniform sizes of plates. Our favourite size, notably for hand cameras, is 4×5; 5×7 has superseded 5×8 as giving a better proportioned picture, and from thence we go through 8×10, 11×14, up to as high as 18×22, but even the most ambitious seldom venture beyond 8×10. Before we made such excellent cameras we were dependent on foreign makers, and those of us who were not natural mathematicians were often annoyed by what we considered inconvenient numbers, those with fractional additions. The reason given us for retaining these latter has been that the glass thus cuts to better advantage, but I fail to see why it is not possible in the first place to make the sheet of glass of such dimensions as to cut evenly into any size plates desired. I have found it difficult to get 5×7 plates in England, though not 8×10.

Lantern Exhibitions.

We are taking great interest in lantern exhibitions, and it is an encouraging sign of comradeship that so many sets are being exchanged between English and American workers. If each, however, will insist on retaining a different size plate, the carriers, at least, should be international, so as to hold either size conveniently. We are, to some extent, using the arc light at these exhibitions, as well as for enlarging, and making slides, but it is so much more powerful than the oxyhydrogen, that the slides should be made with that point understood, or they will show weak on the screen. Our manufacturers make excellent negative and lantern plates, and I have been taken to task more than once this summer for saying ours are more rapid than the English, often a very questionable advantage, but actual experiment has proved to me that, with two representative makes of lantern plates, I had, under precisely similar circumstances, to give the English three times the exposure of the American to gain the same result. We are giving increasing attention to the nature of the subject in matting and mounting our slides, and the old circular, or even uniformly round-cornered matts, are now seldom seen. I must mention that in one of the New York societies the slides are thrown from behind on the screen, which is transparent, giving a charming ground-glass effect. One amateur, having a private lantern, projects his slides on a heavy ground glass, placed between two parlours, and framed by curtains. The effect is excellent. With my own oxyhydrogen apparatus, I use a heavy linen screen, buttoned on a framework, like an old-fashioned quilting frame, set on rollers. This is thoroughly wet, and then stretched taut. The light is powerful, and every slide I send out is thus tested before mounting. My matts are all cut from special designs, and sometimes a dozen will be tried on one slide, and the same slipped into my lanternoscope for examination before a choice is made. We have what are called test nights in two of the New York societies, when one or more of the Lantern Committee attends to give a final decision before the slide is considered suitable for a general audience, though the meeting is very informal, and members feel perfectly free to express individual opinions to the pleasure or otherwise of the respective slide-makers. In one society, if desired by any member, the meeting-room is at his or her disposal for an entertainment, and one of the Lantern Committee will attend to manage the slides. Films, in place of glass, seem to make their way slowly among us, in spite of their undeniable merit of lightness, and I can speak feelingly on the subject, considering the quantity of 8×10 plates I have to carry home in October.

Films have certain defects which make me, as yet, prefer glass, but demand always creates supply, and I expect to see them eventually almost supersede the latter. One of our leading firms making photogravures urges me to copy all my valuable negatives on celluloid, as a precaution in case of injury to the originals.

The idea is good one, as experience showed, when one of my 14×17 negatives was smashed on its way back to me from the reproducers through careless packing. He made me a negative, original size, from the small transparency he used, but the qualities of the original would have been far better preserved by the method above mentioned.

Development.

Coming to the question of development, there is much divergence among ourselves, and what little developing I have done in England has shown me that this is especially marked when compared with English methods. We are not given to using ten per cent. solutions, as is much done here, for many of our workers are skilful chemists, and have a great liking for experimental work both in development and printing, studying the scientific theory as well as practice, some workers having fitted up laboratory attachments to their developing rooms. I must say, though, that it is not always those who have the greatest number of well filled shelves and shining weights who actually accomplish the best scientific results.

The use of acid-sulphite is quite general, and, though in club dark rooms the hypo solution is ordinarily kept in stock, home workers prefer to make it up fresh, graduating its strength as desired. My own custom is to partly fill my fixing dish with water, and then put in a handful or more, as judgment dictates, of hypo crystals and a little acid sulphite to keep the bath clear. Even then I do like to dip the negatives or lantern slides in a bath of saturated alum and sulphuric acid either before or after fixation. When pyro, which is still first with a large majority of our workers, is used with ammonia or soda, it has for a long time been my custom, many times suggested to others, to make up solutions of sulphite and carbonate of soda in large quantities by hydrometer measurement instead of weight, the pyro being always made up fresh one to twelve, and old developer never being kept under any circumstances.

Then, with a little, very little, saturated bromide of potassium, not ammonium, and plenty of water, the operator usually has only himself to blame for failure. It seems a little strange that English workers prefer ammonia to soda as an alkali, and Mr. Bothamley, in his Edinburgh paper, gave a very clear idea of the action of each, which, to my mind, seemed rather in favour of soda. I was asked in London, by a scientific expert, which side of photography was my "particular vanity," as Sam Weller would say, and on my describing the advantages of my developing room, was triumphantly told that such was practically acknowledging photography science, not art, a dictum to which I promptly and positively demurred, claiming that each has its own special standing, alike worthy, thereby proving the length and breadth of the photographic field.

Printing Surfaces.

We are turning more and more towards matt surface prints, largely platinum and kindred processes such as kallitype No. 2., and plain salted paper; but we make a great number of bromides, especially in sepia tones, which are considered a refreshing change.

The Manhattan paper admits of several tones, according to development, and Iota prints, also made on celluloid as transparencies, are likewise very effective.

These latter processes are quite slow. The paper sent out by the Eastman Company seems to fulfil the promises made for it, and can be utilised for either glossy or matt-surface prints. It is to be hoped that our workers will, after a while, give carbon printing the place it should occupy among us. We admit its beauty, but only a few use it, though an effort is being made now to encourage amateurs to try it. Two or three of our leading manufacturers are making the tissue, but the heat of our summers renders its use mostly confined to the winters, when the light is poor.

We trust that every year we, the two English-speaking nations, will grow into closer accord, and each learn from the other of its best characteristics. There should be only a healthy spirit of rivalry, enough to bring out the latent energies of each nation, and thus continually advance the work in which we are mutually interested. It is growing rapidly among us, constant improvements are being made, new apparatus and methods of work new invented, societies formed and, besides the regular photographic journals, the daily press gives space to all especially interesting meetings, and our purely literary magazines more and more are utilising the art-science in their pages, for illustration and in the shape of articles. Photography has a great future among us, and he would be indeed a prophet who could reveal it; but we never will make lasting and steady progress without keeping thoroughly informed on the work being done this side of the ocean. We should mutually take part in each other's exhibitions, and can in no better way realise our deficiencies and gain courage from our evidences of progress.

There is plenty of room in the world for good work, and such will surely meet with recognition in the end. We, in common with our English co-workers, should steadily hold that fact in view, and give our best energies to its accomplishment. Thus, and only thus, do we deserve to reap the fruit of our labours in the many-sided harvest of photography.

Catharine Weed Barnes.

ROYAL CORNWALL POLYTECHNIC EXHIBITION.—PHOTOGRAPHIC DEPARTMENT.

Report of the Judges.—Professional Section.

The Judges have the pleasure to report that this department is well sustained both in the professional and amateur sections, and they were pleased to notice that upon no previous occasion was there less work of an inferior character. The first name which appears in the catalogue is that

of Mr. W. H. Harrison, a local photographer, who shows in several classes, and a first bronze medal is awarded to him for an enlargement of *Penryn street.* Mr. Whaley, of Doncaster, is represented by a picture of the *genre* order. Mr. Robert Frost, of Loughborough, two frames, one of which contains an amusing picture of *Missus' New Bonnet.* Mr. W. Scorer, of Havant, has three very large pictures taken on 30 × 24 plates, two of which would have been much improved by the addition of clouds. To his large view of Portsmouth Town Hall has been awarded a first bronze medal. Mr. W. J. Byrne, of Richmond, Surrey, takes a second silver medal for *Portrait Study of a Lady*, and he also shows several other works, including *The Alphabet Illustrated.* Messrs. Chaffin & Sons, of Yeovil, exhibit several frames of large portraits. Mr. Lyd Sawyer, of Newcastle-on-Tyne, this year has taken a new line with his *genre* pictures. Mr. R. H. Lord, of Cambridge, takes first silver medal in the *genre* class for his fine picture named *How's That.* Mr. J. Edison has one frame of indoor studies. Mr. R. Yeo, of Plymouth, is well represented. Mr. A. Guye sends a frame of fine enamels which have secured hon. mention. Mr. J. Milman Brown, of the Isle of Wight, receives a first bronze medal for *Landscape with Sheep*, and he shows several other very creditable productions. Mr. E. Vigo, of Chelsea, has sent several enlargements, which are somewhat hard and cold in tone. Mr. P. Lewis shows a frame of little gems, *Seaside Studies*, hand-camera work. Mr. Thomas Protheroe, of Bath, has taken first bronze medal for a portrait enlargement. Mr. W. J. Anckorn, of Arbroath, has been awarded a second bronze medal for flower study, *Lilium auratum.* Mr. C. James shows a well-posed group called *At the Pantomime.* Mr. C. A. Brightman exhibits some good interior work of Gloucester Cathedral. Mr. R. Terras has some *genre* pictures which evince careful study. Mr. Ernest Spencer shows four portrait studies, printed in platinum, which are very effective. Mr. Adam Diston has several pictures of the *genre* order in his well known style. Mr. R. S. Webster, of Edinburgh, sends an enlargement of a landscape showing castle. Mr. Wheeler exhibits a panoramic picture, printed in sections, of *Glaciers, South Island of New Zealand.* First silver medal for portrait work has been awarded to Mr. William Warneuke, of Glasgow. His work is of a very high order, and his landscapes deserve special commendation. Mrs. A. E. Blake contributes some portraits finished in colours by the air-brush process. Mr. Norman Blake sends three studies of flowers.

Amateur Section.

Rev. A. H. Malan shows a frame of curious pictures of the instantaneous order representing the last of the broad gauge. Mr. A. L. Spiller shows a frame of nine specimens of ancient armour, which are full of detail. Mr. J. F. Lloyd, of Liverpool, shows four frames of cloud, marine, and rural studies, which show very careful work. Rev. J. E. Hermon has a series of pictures of Venice of great interest. Mr. A. W. Gotflieb exhibits a good number of works, the most striking of which is a study of a bunch of grapes—it is almost stereoscopic; it receives a second bronze medal. Mr. J. Campbell shows four marine pictures. Rev. H. B. Hare, of Frome, is represented by three pictures in his well-known style. Mr. H. Tonkin, of Penzance, receives a second silver medal for his enlargement, *A Land's End Fisherman*, which is undoubtedly well merited; he also shows many other excellent specimens. Mr. A. R. Dresser, of Bexley Heath, exhibits enlargements printed on rough drawing-paper. Mr. C. A. Roe has been awarded first bronze medal for his picture, *The Sedge Gatherers*, and his other productions are very artistic.

Messrs. Brightman, Stabb, Harding, and Major J. D. Lysaght compete in the Hand-Camera class, the latter gentleman securing first bronze medal for his well-executed examples. Mr. F. H. Pickford sends a picture of a rather sensational order, of *Miners at Lunch*, taken 1120 feet below the surface in a coal mine, "Talk-o'-the-Hill," Hart's flash-lamps being used, same as exhibited a few years since. Mr. J. E. Austen sends some clever little pictures. Mr. K. E. Truscott shows several miscellaneous examples. Mr. H. Dudley receives first bronze medal for *An Old Porch*, which is well rendered. Miss Amy F. Eales sends three views near Penzance. Mr. A. J. Leeson has two editions of *A Thirsty Crew.* Mr. C. B. Moore, of Philadelphia, sends several pretty studies. Mr. W. L. Colls contributes four pictures, his river studies being very artistic. Mr. J. W. Evans sends three photographs of *Street Arabs.* Mr. A. Nicholson receives first bronze medal for instantaneous work *Off to the Fishing Grounds*; he has also some fine *Interiors of Haddon Hall.* Mr. A. G. Tagliaferro has three pictures of the *genre* order of an amusing character, to which honourable mention has been awarded.

Photographic Appliance Section.

Mr. W. Newton, of Fleet-street, London, sends two portable tripod stands, fitted with Elmer's patent levelling head, made in platinum, which is a very clever arrangement, and commends itself to travellers; he also sends a telescopic tripod stand, in the same metal, which is very light and portable. Mr. Hawkins, of Bloomsbury, London, sends a magazine hand camera, which possesses many novel points; it is well made and very simple in its construction and easy to work; the shutter is a very clever arrangement. Mr. H. Smith sends an adjustable printing frame for vignettes, which is very effective.

During the Exhibition week Mr. W. Brooks gave two lantern entertainments to large and appreciative audiences, Mr. J. F. Peasgood being the lecturer.

PHOTOGRAPHIC INDUSTRIES.

Messrs. Elliott & Son's Works at Barnet.

Since last we had occasion to inspect Messrs. Elliott's Works at High Barnet, considerable changes, not only in the scope but in the personnel of the house, have taken place. Whereas formerly the style of the firm was Elliott & Fry, which indicated that the establishment at Barnet was devoted to the production of the printing and enlarging for the famous Baker-street Portrait Studio, it will have been observed that the name has recently been changed to that of Elliott & Son. This alteration emphasises the fact that the house of Elliott & Son has been entirely dissociated from the firm of Elliott & Fry, with which, indeed, at the present moment its relations are simply those of any other business house, the two firms being entirely distinct in all respects. The erection of the house of Elliott & Son into a separate concern has led to some additions to its field of operations, the chief of its new undertakings being, as our readers are of course aware, the manufacture of the now well-known brand of "Barnet" dry plates.

Within the last few days we were given the opportunity of visiting the works at Barnet in order that we might observe the degree of expansion they had undergone since the date of our previous visit. On this occasion our conductors were Mr. Hubert J. Elliott, the son of the principal, and Mr. Birt Acres, the manager, the former gentleman exercising, we gathered, personal superintendence over the department devoted to the preparation of the dry plates. It should be here remarked that, for the innumerable photographic purposes to which these works are devoted, scarcely a better situation could be desired, their position at the summit of a lofty hill, and commanding a north-eastern aspect over open country, being an eminently agreeable and suitable one.

Possibly in few similar establishments to Messrs. Elliott's are there so many departments in simultaneous operation, and so large a number of rooms set aside for their due and proper conduct. Indeed, when we were there, the rooms we passed through were so numerous that we found it difficult to keep count of them, while their description, or even their mere enumeration here, would occupy a more considerable portion of space than could be well spared. Naturally, the dry-plate department first claimed our attention, and after passing through the glass-cleaning room, where we observed that the glass was being cleaned by the homely device of scrubbing, we came to the coating room, which is partly situated underground, and the temperature of which is controlled without the use of ice. Cadett's highly ingenious coating machine is used, its rapidity of working allowing of thirty-three half-plates per minute being coated. Here we note that at Barnet, in contradistinction to several other dry-plate factories, the single, instead of the double, half-plate is coated, Messrs. Elliott making it a feature to cut as few of the coated plates themselves as possible. The coating room is illumined by orange-yellow light, though the plates, as they leave the machine, are examined by ruby light, which, Mr. Acres informed us, is essential for the detection of defects. The washing, cooking, and drying rooms, all fitted with the most recent appliances, were in turn passed through, and incidentally we learned from Mr. Acres that the Barnet plates are tested stereoscopically—that is, a newly made plate, and a standard plate of known quality receive equalised exposure and development, in order that comparison may be the more readily and assuredly obtained. The stores departments of this section of the establishment amply attest the large output of plates.

If only for the extensive amount of silver printing which is executed there, it would be quite worth Messrs. Elliott's while to sensitise their own paper, but, when to this home consumption is added a large sale, it will be understood that this department, through which we were shown, is an important one. Pausing for a moment in the room where the fixing and washing are conducted (the latter being performed by the passage of the print through several successive baths), Mr. Acres stated that, during the recent epidemic of blisters, these scourges of the silver printer were unknown at the Barnet Works. Carbon printing and enlargements are a speciality of Messrs. Elliott, and at Barnet the carbon process is, as we said, worked *ab initio*, even the tissue, treated with something like twenty varieties of differently coloured pigments, being prepared there. We were shown a number of fine carbon enlargements recently executed. Two of these (one from a negative of a dog by Mr. Fall, the other a sea-piece of Mr. Birt Acres) were on view at the Edinburgh Convention, and attracted much attention. Besides one devoted to bromide enlarging, a separate department is occupied by platinotype printing, which is here largely employed. A great deal of the printing is done out of doors on shaded benches readily movable to any position, and at the time of our visit some hundreds of frames of various sizes were in requisition.

To a large extent a trade printer's or enlarger's partakes of the nature of a photographic hospital, for hither come all sorts of cripples in the way of

negatives, from which good enlargements or prints must be got by hook or by crook. We were struck with the skill of Messrs. Elliott's staff in the art of doctoring poor negatives, and of making excellent enlargements from indifferent originals. Mention of enlargements reminds us that for enlarged negatives the wet-plate process is employed at Barnet, and we were highly delighted with the extensive and, at the same time, extremely able manner in which the process was being worked while we were there. The wet-plate room appeared to us a model of neatness and good order. Daylight and artificial light are employed as occasion allows, the maximum size of negative made being 53 × 38. The silver bath for this and smaller sizes is swung on its centre, thus assuring an even flow to the solution. An adjacent room is devoted to the glass-cleaning.

An immense number of the small carbon opals with which the public are familiar are produced at the Barnet Works, quite a staff of young ladies being exclusively occupied in touching out defects, a huge pile awaiting their good offices as we passed through this department to that in which other young ladies were engaged in like attentions to silver prints, and thence to the domain of the artists whose duty it is to work up and finish off bromide enlargements, &c. Other rooms contained stores of negatives, mounted prints, and cards, a separate room being occupied for mounting. Needless to say, that in the course of our peregrinations the heating, ventilating, and machinery-driving arrangements were duly shown and explained to us, and, like everything else at the Barnet Works, appeared to be of the newest and most effective type.

The foregoing brief outline may convey some idea to our readers of the ramifications of Messrs. Elliott's business, although, as a mere effort of description, its inadequacy must be apparent when we mention that it took us several hours, in company with our courteous *ciceroni*, to traverse the innumerable rooms of the establishment. This very inadequacy can but, however, serve to indicate the extent and importance of Messrs. Elliott's Barnet Works, to which we have no hesitation in assigning a high place among modern photographic enterprises.

Our Editorial Table.

The Year-Book of the *Fotografisk Tidskrift* (our Stockholm contemporary) has a number of able articles and serviceable formulæ. The illustrations, of which numerous examples of the chief processes are given, are some of the finest we have seen in a photographic publication.

The Dallastype Shakespeare. Part II.

Duncan C. Dallas, 5, Furnival-street.

The second number of this reproduction of the First Folio (1623) edition is before us. It gives the chief part of the play of *The Tempest* in "Dallastype," which compares most favourably with other reproduction processes previously employed on the famous edition.

From Messrs. York & Son we have received their twenty-third annual supplemental catalogue of lantern slides and lecture sets for 1892–3—which gives particulars of many recent and attractive additions to their lecture sets, topographical, fictional, and otherwise—one being devoted to the life and works of the late Mr. C. H. Spurgeon. We note that the firm has removed to larger premises at 67, Lancaster-road, Notting Hill, W.

Messrs. G. W. Wilson & Co.'s list also contains particulars of many new sets from negatives by G. E. Thompson (Norman, Italian, Dutch, &c.), Lyddel Sawyer (*genre* studies), and other clever photographers. With few exceptions, the whole of these new sets are from direct negatives.

Pictorial Selection in Photography. By W. D. G.

Photographic Section of the Croydon Microscopical Society.

This admirable paper on composition as applied to picture-making by photography has now been reprinted, together with the excellent explanatory illustrations, in pamphlet form. As an enunciation of the rules of art which should govern the selection of photographs, it is distinguished by such clearness and accuracy as to be easily comprehended by students of photographic art. Copies of the pamphlet, which is tastefully printed, may be obtained, price *7d.*, of Mr. H. D. Gower, 16, Wandle-road, Croydon.

Standard Lens Flanges and Adapters.

By Taylor, Taylor, & Hobson, Leicester.

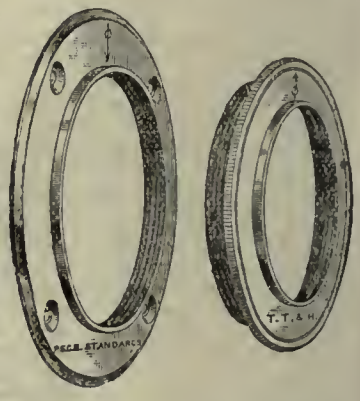
We have very often commented on that serious absurdity and drawback in our lens system, the infinite variety of diameters and screw-threads adopted in the lenses and flanges of the various makers, both at home and abroad, similar lenses of one manufacturer not screwing into the flanges of those of another producer. The Photographic Society of Great Britain did a great work in recommending a definite standard for adoption, and it is much to be regretted that this is not yet generally adopted, although it has been so in some instances. We have often cited the case of the microscope, in which uniformity prevails throughout, as the system which ought to be adopted with photographic lenses. We hail with pleasure every effort made to bring about this state of affairs; and as a very lucid exposition of certain improvements in this direction made by Messrs. Taylor, Taylor, & Hobson, we make no apology for printing the following which we have received from them:—

"We have much pleasure in sending you, by post, a 2-inch standard lens flange, and a 2 to 1·5-inch standard adapter, as examples of our recent improvements in lens fittings.

The well-known difficulty of starting the usual form of screw has two elements—that of knowing at what point in the revolution the threads first engage, and the difficulty of holding the screws in correct relation axially. Our invention surmounts these two elements of difficulty.

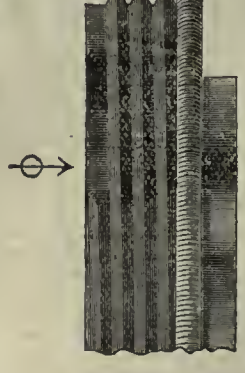
In order to describe it fully, it is necessary to refer to the system we designed for providing that all lenses fitting the same flange are held with their diaphragm indexes or other fittings in one uniform convenient position. The present invention is a supplement of that system.

By arranging that the threads of male flange screws upon lens mounts should terminate at their shoulders in one uniform position in relation to the diaphragm indexes, it was provided that they might all screw home with their diaphragm indexes in one convenient position. In the present invention, by arranging that the threads commence abruptly in a similar uniform position in both male and female screws, it is provided that any lens, when presented to its flange with its diaphragm index uppermost, or as it is arranged to be used, is in position, on being turned, to at once engage with the screw of the flange.



The illustrations show a standard flange and an adapter in the position of rotation at which the screws would immediately engage on being turned. This position is shown by the zero marks, which would again coincide when the flange and adapter have been screwed together. In the same way, any properly constructed lens would screw into the flange or adapter, its diaphragm index being at zero at the commencement and completion of the engagement.

So far it has been shown how this invention decides at what part of their revolution the screws shall first engage. The enlarged portion of a standard adapter seen in the illustration exhibits the manner of forming the male screw thread to commence abruptly near the zero, and it will be understood that both the internal and external screws are formed similarly in this respect.



The common practice of merely chamfering or bevelling the ends of screws, which leaves the threads to terminate not abruptly, but to die away gradually in the course of revolution, not only makes it difficult to find the position for first engagement of the screws, but by forming the chamfers into a kind of ball and socket, makes it hard to determine their correct position axially.

It will be seen that our method of removing this usually incomplete portion of a thread, and forming a cylinder at its root, provides a clear shoulder and bearing which determine the true axial relation of screws when placed together for engagement.

For convenience and uniformity the zero of a screw and its abrupt commencement are at that part of the revolution at which the point of a tool cutting the female screw would lie in the plane of its face or shoulder.

It must be borne in mind, however, that this applies only to a screw of absolutely correct size and form, for any error in the dimensions of a screw would cause corresponding displacement of its true zero.

For some time past, in view of the importance of accuracy in these matters, we have given attention toward the improvemsnt of appliances

for making and measuring screws, with the result that we now prepare all screwed fittings within a limit of error of one-thousandth part of an inch on their diameter, and confine the error on that side of the normal which ensures perfect and free interchangeability.

The fittings we have pleasure to send you as examples of our improvements in screws have been prepared to this degree of accuracy, and, with allowance for some very slight alteration during the processes of finishing, we are confident that all work leaving our factory is thus accurately formed."

We have nothing to add to this further than to say that the specimen flange and adapter received attest the great accuracy achieved in the fitting.

Spotting and Colouring Media.

J. R. Gotz, 19, Buckingham-street, Strand.

Mr. J. R. Gotz has submitted to us specimens of a new kind of moist colours for colouring photographs, which are applicable either to albumen or gelatine-surfaced prints. A special feature of the colours (of which there is a great variety) is that they dry with the same degree of gloss as the surface of the print. Mr. Gotz also has a series of moist "spotting" colours useful for either touching out defects on negatives or positives without previous preparation of the surfaces. Both sets should be extremely useful to professional and amateur alike.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
September 5	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 5	Halifax Camera Club	
,, 5	Peterborough	Museum, Minster Precincts.
,, 5	South London	Hanover Hall, Hanover-park, S.E.
,, 5	Stereoscopic Club	Brooklands Hotel, Brooklands.
,, 6	Exeter	College Hall, South-street, Exeter.
,, 6	Glossop Dale	Rooms, Howard-chambers, Glossop.
,, 6	Herefordshire	Mansion House, Hereford.
,, 6	Lewes	Fitzroy Library, High-st., Lewes.
,, 6	North London	Wellington Hall, Islington, N.
,, 6	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 6	Rotherham	
,, 6	Sheffield Photo. Society	Masonic Hall, Surrey-street.
,, 6	York	Victoria Hall, York.
,, 7	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 7	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 7	Putney	High-street, Putney.
,, 7	Southsea	
,, 7	Wallasey	Egremont Institute, Egremont.
,, 7	West Surrey	St. Mark's Schools, Battersea-rise.
,, 8	Birkenhead Photo. Association	Association Rooms, Price-street.
,, 8	Bradford Photo. Society	50, Godwin-street, Bradford.
,, 8	Hackney	Morley Hall, Triangle, Hackney.
,, 8	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 9	Manchester Photo. Society	36, George-street, Manchester.
,, 8	North Kent	Gravesend.
,, 8	Oldham	The Lyceum, Union-st., Oldham.
,, 9	Cardiff	
,, 9	Holborn	
,, 9	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 9	Maidstone	"The Palace," Maidstone.
,, 9	Richmond	Greyhound Hotel.
,, 9	West London	Chiswick School of Art, Chiswick.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

August 25.—Mr. J. J. Briginshaw in the chair.

Mr. Hubert J. Elliott was elected a member of the Association.

Messrs. Sprange & Co. sent a sample of sensitised paper (about quarter-plate size) for exhibition among the members; while Messrs. Newman & Guardia sent circulars of their "N. and G." shutters.

Stereoscopic Photography.

In the course of the adjourned discussion on this subject, a brief conversation on pseudo-scopic effect took place, subsequent to which Mr. T. Bolas alluded in complimentary terms to Dr. Donnaden's recently published book on *Stereoscopic Photography*.

Mr. J. S. Teape said he preferred to look at pictures without a stereoscope, as a great many stereoscopic pictures caused him much more pain than pleasure, which was the case with several pictures exhibited before the Association about eighteen months ago by Mr. A. L. Henderson. Several of these would not combine, and caused him such pain that it was impossible for him to continue looking at a number of pictures. He fancied that the principal cause of this was the incorrect mounting.

Mr. W. E. Debenham remarked that, by moving the lenses, the pictures Mr. Teape complained of would probably combine.

Mr. Teape (continuing) alluded to a collection of stereoscopic slides he had brought with him, and said that they exhibited two kinds of distortion—in one case one picture being mounted higher than the other. The slides were between thirty and forty years old, and had been placed for eight years in a damp cupboard, where some of them had got stuck together and mildewed. Only a few, however, had deteriorated. In one slide both pictures were exactly alike, so that no stereoscopic effect could be obtained.

Mr. J. Weir Brown said that one fault with stereoscopic slides was that they sometimes showed more stereoscopic effect than was agreeable to the eye. They were, in fact, something like the set scenes in a theatre—one part standing out very much like side pieces.

Mr. Debenham asked whether the slides to which Mr. Weir Brown referred were from nature? If the lenses were separated more than the natural distance of the eyes, the effect of a model would be obtained. No photograph from nature would give that effect. An object looking like a set scene at a theatre would have greater rotundity, and would, in fact, be like a miniature model with everything in its own proper relief. He thought they were justified in using instrumental aid for obtaining more relief than with the natural eye.

Mr. Bolas spoke of a photograph of the *Venus of Milo*, which, owing to a wide separation of the lenses, showed an exaggerated relief when viewed in the stereoscope.

Egg Albumen *versus* Blood Albumen.

The following question from the box was read: "How can photographers tell whether blood or egg albumen has been used in the preparation of sensitive albumen paper?"

Mr. Bolas said he had had submitted to him samples of blood albumen which showed signs of putrefaction, while others did not. He thought it was rather a question as to how the albumen was treated than the origin of it.

The question was not otherwise answered.

Flower Photography.

Mr. Weir Brown asked what was the best background to photograph a white flower against, at the same time passing round a photograph of a white flower backed up with black velvet, against which some green leaves were indistinctly rendered.

Mr. Beckett recommended brown paper placed out of focus.

Mr. C. H. Cooke would use a grey background with a plate dipped in erythrosine.

Amidol.

Mr. J. A. Sinclair exhibited a number of lantern slides developed with amidol according to the following formula:—

Amidol	80 grains.
Sodium sulphite	800 ,,
Water	8 ounces.

For use, one ounce of the solution diluted with three ounces of water, with one and a half grains of potassium bromide to the ounce of developer.

The tones of the lantern slides were much admired, and Mr. Sinclair stated that he had used the developer for negatives successfully.

Hackney Photographic Society.—August 23, Mr. Hensler presiding.—Members' work shown from Messrs. A. Barker, Dean, Hensler, and Sodeau. Borax recommended to be added to toning bath for printing-out paper. Mr. R. Beckett read a useful paper on *The Suitable Printing Process for a Given Negative*, recommending the following: Bromide rapid paper, at great distance from the light for thin negatives; bromide slow paper, longer exposure, and thicker negatives. Bromides generally require a thin negative with a compressed scale of gradation. For enlarging, avoid hard or yellow negatives. The greater the distance the more latitude. Always make a test exposure. Contact printing—exposure must always be exact. Ferrous-oxalate developer—best half old, half fresh. Alpha paper—half tones must not be too heavy. Over or well expose, should develop red colour; can then tone all shades from red, brown, black, to blue. Developer recommended, hydroquinone and elkonogen mixed, can be used over and over again. To mount alpha paper with the polished surface, paste waterproof paper on back (black side outwards) after squeegeeing. Use glue and treacle, or glue and glycerine, work up to a froth on a board, hold print in hand, dab on and off several times in the same way that boxmakers do, till sufficiently glued, and place on card mount. Gelatino-chloride papers, same treatment. Platinotype, high lights must be heavy; use the new cold-bath process. With this paper the delicate tones do not fix out much. Carbon tissue, best for all work above whole-plate. Thick pigment for thin negatives, and vice *versâ*.

Leytonstone Camera Club.—August 24, Special General Meeting, Dr. W. Pickett Turner in the chair.—A proposal was brought forward from the Photographic Society of Great Britain, setting forth the advantages of affiliation with them. After a discussion, it was decided to become affiliated. The Exhibition was decided to be held on November 10, 11, and 12, at the Masonic Hall, Leytonstone.

Richmond Camera Club.—At an informal meeting held at the "Greyhound Hotel" on the 26th instant, the President in the chair, Mr. G. W. Ramsay brought some fine studies of sea and cloud taken from his yacht, and some printed on rough drawing-paper. Mr. Cembrano, junior, showed a copy of the Convention Group taken on a whole-plate by Mr. J. Stuart, of Glasgow, which showed remarkable definition and good detail, although taken with a drop shutter and lens of *f*/12·5; the lens used was one of Zeiss's, of seven and three-quarter inches focus. Mr. Ennis had a series of experiments on toning Ilford printing-out paper, showing a great variety of colour, from red-brown to black, the first colour being obtained by one minute's toning in a combined bath, and the black by a quarter of an hour's immersion in the same bath. He further exhibited a print on the same paper, which had been exposed to sunlight during the last six weeks, one-half of which had been covered with black paper; no deterioration or signs of fading were apparent. One of the members having asked which was the best way of stopping out pinholes in a negative, Mr. Cembrano said that he used smoke-black and a very finely pointed sable brush No. 0; instead of water, he preferred wetting the brush in his mouth; only the smallest amount of pigment was necessary, and, in order to match the colour of the negative, he would first try painting on the clear

rebate of it. Mr. C. H. Davis showed Ross's divided camera with swing-back attachment. Messrs. R. & J. Beck sent for inspection the Bynoe printing frame, which has the advantage of being small, casting no shadow on the print, and enabling the operator to have a full view of same. Mr. J. B. Huddy was elected a member.

Birmingham Photographic Society.—August 23.—The members assembled to welcome Miss C. W. Barnes, of New York. During the evening about fifty slides, comprising views of Birmingham, Warwick, Kenilworth, Stratford-on-Avon, Wooton-Wowan, Broom, &c., were exhibited by Mr. E. H. Jaques. Mr. E. C. Middleton described the different views as they appeared on the screen. Ordinary meeting held on August 25, Mr. G. F. Lyndon in the chair. —Three new members were elected. Reports were read of excursions to Berkswell, Wixford, Warwick, Aston, Cantlow, and Kenilworth. Miss Barnes accompanied the members on the latter excursion. Messrs. Marion & Co. sent a sample box of dry plates for the purpose of illustrating their new system of packing, the object of which is to secure a packing perfectly non-injurious to the film. The system met with the unanimous approval of the members present. The CHAIRMAN announced that the judge had awarded the prize offered in connexion with the Development Competition, held in July, to Mr. Geo. Wilkes. The enlargements offered by the Society for the best prints from negatives taken on the Berkswell and Wixford excursions were awarded to Mr. E. Underwood and Mr. Sears respectively. It was moved by Mr. E. H. JAQUES and seconded by Mr. E. C. Middleton: "That the hearty congratulations of the Society be offered to the President (Sir J. B. Stone) on the occasion of his receiving the honour of knighthood from the hands of Her Majesty the Queen." A discussion on *Hand Cameras and their Work* was opened by Mr. JAQUES. Messrs. GRIFFITHS, MIDDLETON, SHEAFF, T. TAYLOR, THOMASON, UNDERWOOD, and the CHAIRMAN took part in the discussion, which was of an extremely interesting and instructive character. Several hand cameras were exhibited and described. Miss C. W. BARNES then delivered her paper on *American Work and Workers* (see page 567).

Liverpool Amateur Photographic Association.—August 25, the President, Mr. W. Tomkinson, in the chair.—Messrs. E. T. Cockerham, A. S. Clare, A. A. Vos, and H. Anderson were elected members of the Association. Mr. Marriott showed some specimens of home-made ground glass, which, he explained, were produced by simply taking two spoiled negatives, placing a little fine sand and water between, and grinding them together for a short time. Mr. F. H. Elsby gave a demonstration on the use of the Society's enlarging and reducing camera. The President then demonstrated the development of under-exposed and over-exposed plates. Under the same conditions as to light, stop, and subject, he had exposed two plates, one for about one-twentieth of a second and the other about five seconds, and from each he now developed a very good negative. The Secretary exhibited Beck's new printing frame, which enables the whole of the print to be examined at once without fear of movement.

Northern Tasmanian Camera Club.—Third Annual Meeting. The President (Mr. R. L. Parker) occupied the chair.—The Secretary read his report, in which he stated that during the year the progress of the Club had been most satisfactory; the number of members on the roll had increased from thirty-six to forty-two. The monthly meetings had been fairly attended, especially those during the latter part of the year, and those at which the optical lantern formed an important feature. At some of the latter meetings a number of visitors, including ladies, had attended. The optical lantern had been in good demand during the year, the loaning of it to members being much appreciated by them. The journals subscribed to by the Club had been in good demand, many of the members being very regular in their application for them as a means of information and instruction. The returns of income and expenditure were given in the Treasurer's statement, and a credit balance was shown. At the conclusion of the reading of the Secretary's and Treasurer's report, office bearers for the ensuing year were balloted for. Competition for the three vacancies on the committee was very keen, there being eight candidates. Four were equal in the first ballot; a second was taken, and the following result was arrived at:—*President:* Mr. William Gibson, of Scone.—*Vice-Presidents:* Rev. A. H. Champion, Messrs. R. C. Kermode, and R. L. Parker.—*Committee:* Messrs. A. C. Bonner, F. Stewart, and J. Sparrow.—*Hon. Secretary and Treasurer:* Mr. F. Styant-Browne. Hearty votes of thanks were accorded to the retiring President (Mr. R. L. Parker) and to the Secretary (Mr. F. Styant-Browne) for their services during the past year. The members of the Camera Club have reason to be well satisfied with the growing prosperity of the Club, and it is expected that during the coming year this prosperity will still continue to grow and do good work in fostering artistic instincts and the love for the scientific and beautiful among its members, and still more spread the knowledge of the charming art science of photography.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 15,098.—"Improvements in and connected with Magazine or Hand Photographic Cameras." F. MIALL.—*Dated August* 22, 1892.

No. 15,278.—"Improvements in Racks, Boxes, Frames, and Receptacles for Storing and Holding Photographic Plates." H. J. MARSON.—*Dated August* 25, 1892.

No. 15,292.—"Improvements in or in connexion with Changing Boxes for Photographic Cameras." A. L. ADAMS and J. W. JEYES.—*Dated August* 25, 1892.

No. 15,407.—"An Improvement in Camera Fronts for Photographic Purposes." W. PAGE.—*Dated August* 27, 1892.

No. 15,447.—"Improvements in and relating to Changing Boxes for Photographic Cameras." Complete specification. A. STEGEMANN.—*Dated August* 27, 1892.

SPECIFICATION PUBLISHED.

1891.

No. 17,298.—"Anhydrous Oxide of Barium, &c." BRINS OXYGEN COMPANY (LIMITED) & MURRAY.

PATENTS COMPLETED.

IMPROVEMENTS IN MAGIC LANTERNS.

No. 12,244. HERBERT CHARLES NEWTON, 3, Fleet-street, London, E.C. *August* 6, 1892.

THIS invention relates to biunial and triple lanterns, the discs of which are made to coincide on the screen.

In such lanterns, the front plates carrying the lenses are hinged so as to be capable of tilting to converge the rays upon the same spot of the screen, from whichever division of the biunial or triple lantern they are projected.

This tilting of the lenses has the effect of diverting the optical axis from the horizontal to an inclined plane, and a difficulty is thus introduced in connexion with the luminant, which is the object of my invention to obviate.

The tray carrying the luminant usually slides in grooves on the base of the lantern, so that the luminant can be moved backwards and forwards towards and away from the condenser along the line of the optical axis. But when the front carrying the lenses is titled, as above described, the motion is no longer in the line of the optical axis, and the value of the adjustment is thereby considerably diminished.

It is desirable, to obtain the best results, that the luminant should be maintained on the line of the optical axis, and be capable of travelling to and from the condenser without moving out of the optical axis, and to this end I carry the lamp on supports rigidly secured to the lantern front, which also carries the lenses, so that the lamp follows the tilting movement of the front plate, to maintain the luminant in the optical axis of the lenses.

The claim is:—In biunial and triple lanterns, the employment of supports for the luminant, rigidly connected with the hinged or movable front plates which carry the lenses, substantially as described, and for the purpose set forth.

A HAND OR DETECTIVE PHOTOGRAPHIC CAMERA.

No. 13,448. GEORGE FREDERICK FRAAS, 18, Portland-street, Stepney, London. *August* 6, 1892.

MY invention relates to improvements in photographic hand or detective cameras, by which a number of sensitive plates or films may be successively exposed in a simple manner.

In carrying out my invention, I provide a suitable box, to carry two stages provided with springs or catches to hold the ends of the plate or film-holders when drawn into them by the changing rod, which will be hereinafter described. For convenience, I store a number of suitable holders to contain the sensitive plates or films—say eighteen, for example—and when the plates or films are so stored they lay in a horizontal position near the top of the box.

To remove or change a plate or film into position for exposure, I provide a rod, composed of any suitable material and made in such a form that it will withdraw the bottom holder, containing the sensitive plates or films, every time it is operated upon; and by its movement it draws or slides the ends of the plate or film-holder into the stages, as above described, and finally places it in a vertical position ready for to be exposed.

The holders containing the sensitive plates or films are held firmly by three or more springs or catches, and remain in the vertical position until the required number is exposed.

What is claimed is:—1. A photographic camera by which a number of plate holders may be changed in the manner substantially as hereinbefore described. 2. The stages by which the plate-holders are held by the springs or catches, as herein and for the purpose described. 3. The form of changing rod by which the bottom plate-holders in the horizontal position are withdrawn and changed in the vertical position, substantially and for the purpose described. 4. The manufacture and use of the improved camera hereinbefore described and illustrated in the accompanying drawings.

AN IMPROVEMENT IN MAGIC LANTERNS.

No. 18,620. HERBERT CHARLES NEWTON, 3, Fleet-street, London, E.C. *August* 6, 1892.

IN optical or magic lanterns, where large condensers are used to cone the light down through the picture of smaller diameter than the condenser on to the focussing lens, it is obvious that it is advisable to place the picture at such a distance from the condenser that the whole of the cone of light passes through it, so that the utmost illumination may be obtained on the screen.

This object is sometimes attained by moving the slide forward till it reaches the required position, and sometimes by moving both picture and front lens forward together.

These methods, however, while providing adjustment for properly coning down the light through the slide, introduce disadvantages, inasmuch as there is a disturbance of the picture on the screen, owing to the positions of the slide and front lens in relation to the screen being changed during their adjustment with respect to the condenser.

This makes it very difficult to ascertain whether the alteration in position has really increased the illumination, and hence these methods are not generally used.

According to my invention there is no disturbance of the slide and front lens with regard to the screen, but I fix my condenser to a movable base on which the jet also adjusts, so that, leaving the picture and front lens in position, I can rack the condenser and jet (without disturbing their relative adjustment) away from the picture, thus obtaining the same advantage as by the other methods without their disadvantages, as I can rack the condenser and jet backwards and forwards to find the best position without affecting the picture on the screen in any way, except by increasing its brilliancy.

The main features of the lantern are the same as those to be found in lanterns already in the market, but the condensing lens, instead of being mounted as heretofore, is carried in a pair of brackets supported in the movable base. This base also carries the luminant, and is capable of adjustment longitudinally by means of a pair of racks engaging with rack wheels upon the transversely mounted spindle.

Thus the condenser and the luminant, without disturbing their relative positions, can be readily retired from the slide in order to bring down the cone of light to the diameter best suited for the picture to be shown, while the slide and the front lens remain undisturbed with regard to the screen.

The claim is:—Mounting the condenser and illuminating jet of magic lanterns on a movable base capable of adjustment to and from the slide, substantially as explained, for the purpose set forth.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

PHOTOGRAPHY BY RULE.

To the EDITOR.

SIR,—Having read the paper submitted by Mr. Bedding to the North Middlesex Photographic Society, I should wish to enter my protest against the whole tenor of his communication.

Almost at starting he says, "The comparative and particular speed of sensitive preparations have been made the objects of close investigation and valuable experiments; and mechanical aids to exposure have called an apparently inexhaustible supply of inventive genius into existence, the main, and, indeed, the sole object underlying all these efforts being not merely the simplification of exposure and development, but their reference to pure rule and system." Yet his whole argument is an attempt to show that there is no value in these valuable experiments comparable with the method of observing the focussing screen, and thus, by trial and error, ultimately acquiring judgment sufficient to produce technically high-class results. His warrant for this conclusion is his own belief, against which may be cited numerous beliefs to the contrary held by good men and true; consequently some more valid argument than personal belief should be forthcoming to justify the principle (if it be a principle) which he advocates.

Turning again to my quotation, we read, "The simplification of exposure and development." What "inventive genius," I would ask, has endeavoured to simplify, and refer to rule or system, the question of development? Beyond a well-founded assertion that many complications of development, formerly supposed to correct errors of exposure, have not the potency once claimed for them, I know of no such attempt in the question of development. What is this "apparently inexhaustible supply of inventive genius" devoted to exposure? A few cards of exposure notes and two really valuable instruments! If Mr. Bedding decries exposure notes made by other people, he must also condemn exposure notes made by the student! The learner must ignore the observation, made for him by others, that, on discarding one-half of a symmetrical lens, he must quadruple the exposure. He must look at the focussing screen, and guess until he can judge. I hold that it is well to learn by errors, when they occur, but it is better to get rid of as many sources of error as possible before calling the judgment into requisition.

While clearing the ground of all elements of knowledge in order to display the pre-eminence of judgment, Mr. Bedding cuts away the ground from under the feet of judgment itself, for he allows no mode of the formation of judgment but the method of trial and error, *alias* "rule of thumb," which he also disowns. And he refers to the results of "judgment" in the matter of formulæ as "most bewildering." Never have I seen an article so calculated to dishearten and repel a beginner in photography as this one in question; and, unkindest cut of all, if a beginner, resolutely discarding all aids to exposure, produce worse results than his companion with such aid, he must not attribute the other's success to his method, but deplore his own want of brains and give the thing up.

They who wish to monopolise technical excellence may be expected to exaggerate the difficulties in the way of a beginner; but I am sure that this is not Mr. Bedding's object. I therefore am somewhat in doubt whether he intends his doctrine to be so literally interpreted as I have done; but, if he concedes anything, it is hard to see where he can stop. He is urging, he says, the principle of buying photographic wisdom by photographic experience.

If once he admits vicarious experience he abandons the whole position. For what are these aids to exposure but the focus of other people's experience? Scientific reasoning, from the multiplication table and the law of inverse squares, is tested by experiment before it is accepted; and, in using an extraneous aid to exposure, we are taking on trust the judgment of others as far as they can help us in the matter.

If it be true, as Mr. Howard Farmer contends, that distance and colour are not sufficiently taken into account, that does not invalidate the claim that the speed, diaphragm, and light are more correctly dealt with than by mere observation of the focussing screen. Moreover, it is impossible that the learner should, while using the same class of plates, calculate his exposures and observe the illumination without learning the lesson Mr. Bedding wishes to teach; he will soon detect an error in his calculation by the appearance of the ground glass.

Will anybody guarantee to obtain a good negative on an unknown plate? Surely not; and, the more one knows of the speed of his plate in relation to the light falling on it, the less will be left to judgment, guess, work, rule of thumb, and the better will be the results.

The "retrospect" is, I think, altogether unfair; from the days of Jabez Hughes downward definiteness in weights and measures has always been advocated, but from Mr. Bedding's account one would conclude that the balance and the ounce measure were inventions of the present decade. It cannot be shown that pinches and handfuls were more or less common then than now, but we for once find pinches and handfuls of light advocated in preference to calculated quantities.

An annual exhibition of the best productions of photography can give no clue to the rise or fall in average quality of work, and, granting that the average may be lower than formerly, this would only prove that a large number of mediocrities have been called into existence by the modern facilities of photography. It cannot be shown that Mr. Bedding's work is worse than formerly; he can, on the contrary, obtain good results where in old times he could have got none; his facilities for picture-making have increased immensely, and no modern innovation tends to the deterioration of his results.

I have observed operators of long experience and judgment, and find that a new sample of collodion, a new bath, a new brand of dry plates almost invariably leads to error; a trial plate is always demanded; and the man of judgment rectifies his error on the second or third trial, while the novice requires a dozen or more.

Though Mr. Bedding states that he is about to examine some of the principles upon which actinometrical or actinographical systems are based, not a word of any such examination appears in any part of his paper. The paragraph headed "No exposure factors constant" is *not* an examination of these principles, but merely a reminder that the list of conditions may require augmenting. The epithets, "mere empiricism," "falsely inspired formulæ," &c., with which his discourse abounds, would lead one to suppose that he was combating dishonest fictions, palmed off on the public for gain. As I understand the question, this is not the case; the empiricism is on the other side. The factors of exposure calculators are correct as far as they go, and their combined effect is *rationally*, not empirically, deduced; and, Mr. Bedding notwithstanding, the beginner *will* extract from them more reliable knowledge with a dozen plates than the unaided student with a great gross. I strongly suspect that the grey-heads also might learn something to their advantage, how to keep pace with the boys. In conclusion, Sir, I cannot help looking on this paper, from first to last, as a mistake.—I am, yours, &c.,

R. C. PHILLIPS.

The Arts Club, Manchester.

P.S.—I see that some gentleman writes in high glee, assuring all and sundry that he agrees with Mr. Bedding. It turns out, however, that he has never made use of the much-abused "aids to exposure." So I should have conjectured.

The foregoing having been handed to Mr. Bedding, the following is his reply:—

"Mr. Phillips' concluding estimate of my paper as a 'mistake' is perfectly admissible in one who is not indirectly interested in the popularisation of Messrs. Hurter & Driffield's actinograph, which, of course, he includes among the two really valuable instruments to which he makes reference. Upon like grounds, also, I can easily understand why Mr. Phillips regards the paper as calculated to dishearten and repel a beginner. While, therefore, I recognise the ability and am flattered by the length of Mr. Phillips' criticism, I ask his leave to subject his counter-arguments to a reasonable rate of discount calculated in the exact ratio of his partiality.

"With the practised skill of an old debater, Mr. Phillips prefers rather to dissect and examine fragments of the paper than to meet it as a whole, a course which renders it a little difficult for me, except at a length to which I am not agreeable to go, to reply to all the points he has raised. I will, however, briefly deal with the principal ones, and at the outset I shall be glad to waive my own belief in the practical value of the method of trial and error, as applied to exposure, if he is content to place the contrary beliefs of his good men and true in the scale against the work done by the vast majority of professionals and amateurs who do not employ aids to exposure.

"In his third paragraph, Mr. Phillips overlooks my reference to mechanical aids to exposure, *i.e.*, shutters, and seems to be unaware of all that has been written and said on the subject of scientific and rational development, and equally oblivious of the fact that ready-made one-solution developers are articles of commerce. If all these, in conjunction with Mr. Phillips' 'few cards of exposure notes, and two really valuable instruments,' have not for object the simplification of exposure and development, Mr. Phillips will, perhaps, indicate their uses. I agree with Mr. Phillips as to the wisdom of getting rid of as many sources of error as possible before calling the judgment into requisition; but it is at least as important that we should be assured that those sources of error are really removed, instead of merely disguised. Does Mr. Phillips undertake to maintain that in either or both of the two valuable instruments he speaks of no 'sources of error' exist?

"Mr. Phillips' next paragraph is cleverly but unfairly cast. I did not refer to the results of judgment in the matter of formulæ as most bewildering. I never used the word judgment in that connexion at all, but the phrase 'differences of opinion.' Again, I did not convey that 'if a beginner, resolutely discarding all aids to exposure, produce worse results than his companion with such aid, he must not attribute the other's success to his method, but deplore his own want of brains and give the thing up.' May I be pardoned for regarding these and other examples of Mr. Phillips' style of controversy as scarcely worthy of him?

"Mr. Phillips is, I think, unfortunate, and at the same time slightly rash, in looking upon aids to exposure as the focus of other people's experience, and forgets the fact that, in photography as in everything else, a little of one's own experience conveys much more instruction than a great deal of another's. I have failed to discover that even the authors of Mr. Phillips' few cards of exposure notes are really practical photographers, and that any exposure table extant has been compiled from actual experience. I rather fear that a knowledge of mathematics is at the bottom of most of them. I have no objection to take the judgment of others in photography on trust, but I demur to having it thrust upon me as infallible.

"I hope that Mr. Phillips' challenge for a good negative from an unknown plate will be taken up. I have myself successfully used unknown plates (that is, plates with which I had never previously worked, which, I suppose, is what Mr. Phillips means), and if my latter supposition is correct, I should think that even with such a slight guide as a trade description of the plates, any photographer of experience would easily accomplish what Mr. Phillips evidently regards as a great feat. But I do not see the utility of this and several other of my critic's remarks, notably that in which I am accused of advocating 'pinches and handfuls of light,' whatever they may be. The phrase is both a misnomer and an exaggeration. Mr. Phillips' final paragraph is word-splitting and nothing more. If my impeachment of the constancy of the factors taken into account in the systems he speaks of was not the result of an examination of principles, what, pray, was it?"

THE NEW DEVELOPER.

To the EDITOR.

SIR,—Having seen in your last week's issue an inquiry with regard to amidol, I think that, as a resident in Germany, I may be able to give some information with regard to it. A few months ago a new developer, called "metol," was brought out by a firm at Feuerbach, near Stuttgardt, which was much approved of by Dr. Eder and other experts, and which, in my hands, has proved in every way excellent. This is a two-solution developer, requiring the addition of sulphite of soda to the solution of metol as a preservative, and when required for use, the addition in various proportions of a solution of carbonate of potash or of soda, according to the negative required—vigorous or soft. The same chemist has now produced "amidol," which is said to be a similar preparation, but containing in itself the accelerator, and thus forming a one-solution developer. It is, however, not yet on the market, and I have been given to understand that its publication will be withheld until the manufacturer has obtained a marked success, and consequently a large pecuniary return from the sale of the first-named substance. When the "metol" is firmly established, then amidol will be offered for sale, so that it is useless to endeavour to obtain it at present. I would strongly advocate the use of "metol," which is beautifully clear in its action, requiring no alum bath, and developing plates of all brands, films, and Eastman's films with equal excellence.—I am, yours, &c.,

August 26, 1892. ETHEL CONSTANCE MAY.

[Our correspondent is evidently unaware that amidol is already an article of commerce in this country, and, as she will see from other parts of this week's JOURNAL, in actual and successful use.—ED.]

PHOTOGRAPHY IN NORTH QUEENSLAND.

To the EDITOR.

SIR,—I sent you in 1890 a few prints of life and scenery in North Queensland, which you criticised very favourably in your issue of July 25, 1890. I have since been working an 8 × 10 Watson's Acme camera, and am now sending you a few prints taken with same, accompanied by a few notes on amateur photography at this end of the world. It is said there is nothing new under the sun. However, a few of my experiences may prove interesting, if not instructive.

Having been over seven years on North Queensland sugar plantations, I left here on February 5, 1891, to visit the scenes of my childhood in Victoria. On the night of the 4th we registered four inches of rain, so I had seven miles of mud and water to drive through to the landing-place on a mangrove creek. On arrival there I found two feet of water round the wharf, and the little tub of a steamer was high among the mangrove branches Armed with the Acme and a spool of forty-eight exposures in roll-holder, I was soon aboard and bound for Townsville, to catch the intercolonial steamer. When about two hours' sail from our destination, at eight p.m., a squall caught us between the lighthouse and a bad patch of rock. The night was black as pitch, the seas swept the decks, the rain came down as only tropical rain can, and the wind put out the lights in the compass box. To make matters worse, the lighthouse was obscured, and for four hours we were tossed about at the mercy of the waves. I began to fear that neither myself nor the Acme would reach dry land again. However, we did, and in two weeks more I was in my native land.

I was most unfortunate with the Eastman roll-holder and film, but owing to no fault of either. To begin with, part of the holder got loose, no doubt owing to my wet trip affecting the glue. I took it to a photographic dealer's in Melbourne for repairs, and on getting it back did not observe the position of the indicator, which they must have wound on several turns, as the first three exposures I cut in half.

I took train for the river Murray, where I embarked on a river steamer bound for the far-famed irrigation colonies of Chaffey Bros., called Mildura. Light and scenery were all one could wish for to make a set of first-class 8 × 10 pictures. During the five pleasant days I spent on the water, and one day at Mildura, I made some two dozen exposures.

I next made a trip, in a few hours by rail, to the district I had spent my childhood in. When I left there to earn my own living, eleven years ago, it was a long, rough, drive or ride of about ten or twelve hours. Now, the iron horse glides smoothly up the valley of the Goulburn River, but apart from that there seemed to be little change, and little increase of population. Only here and there had the monotonous gum forests given place to cultivated fields. This is due to the extent to which protection is carried in Victoria. The great bulk of the population are in, and close to, Melbourne.

Arrived at the little township near which my home used to be, I found it more slow-going and sleepy than ever. No bell was rung in the hotel I went to (the leading one), and, after hanging round the breakfast-room for a long time, the only other man who was in it remarked to me that, if I wanted breakfast, I would need to go to the kitchen and order it—and so I did. Even *North* Queensland is a peg ahead of that. I exposed a lot more film here, and then went to a sheep station, twenty miles from the township. The night was the coldest I had felt for eight years, and in my bedroom I removed the roll of exposed film in the dark, and then began to struggle with a new roll I had bought in Melbourne. To my dismay, I found it was a roll of cut sheets, and, for the first time, I discovered that I should have asked for a "spool," and not a roll. This ended my photography, though I could have got another forty-eight splendid views. Now comes the worst part of it. On arrival here again, I began to develop, and after cutting three in half, owing to the roll being wound on a few turns by the man who repaired it, I developed the remainder, and found them all hopelessly fogged, owing, no doubt, to the same man letting light into the roll-holder. Such is my experience with Eastman film.

Before leaving Melbourne I purchased two film-carriers to use the cut sheets with. I made one exposure there. Before I got it developed here, I was taken ill and laid up for three months. On recovery, the hot weather had begun, so I did no more photography till May last. I then developed this film, which had been exposed twelve months ago, and got a very good negative.

I store my plates and paper as follows:—I cut the tops out of two 4-gallon kerosene tins, paint them with red lead, then put them back into the case they came out of, which I also paint. I then make a lid with a pad of leather on the under side, which, when shut down and a weight placed on it, makes the two tins quite air-tight. On a very dry day I pack away plates, paper, &c., in the tins, and find that goods so stored are just as good at the end of our rainy season as they were when bought fresh. All the vessels I use to store and carry water in and to wash plates are made by myself of tins painted with three coats of red lead. I have two kerosene tins on a high shelf and a small piece of rubber tube leading from them to the table I work at. I have a big wash-up dish, also painted, over which the tube hangs, and is very handy for washing plates when changing from one solution to another. My shelves are kerosene cases one above the other, laid long ways for small bottles, and end up for long bottles.

Negatives, 8½ × 6½, I keep in "Pain Killer" boxes, and I fold a sheet of foolscap once, and place the negative between, with the number and subject written outside; 8 × 10, I have to make boxes for, and use a double sheet of foolscap cut to size.

I stick to the old-fashioned pyro-ammonia developer. I do not put my prints into an album or mount them on cards, but bind them in a novel way of my own, a description of which may be of interest. Whole-plate views, for example, I print on paper cut to give a margin on the top, which is masked while printing. Into a wooden frame, which I made for the purpose, I place, first, a sheet of strong but thin paper, exactly the same as I am writing on, but not ruled, of course; then a print with masked margin exactly over the edge of the first sheet of paper; and so on, a print and a sheet of paper alternately, till a book of twenty-four or forty-eight is complete. I then punch holes along the upper edge through both print and paper, and bind all together with fine copper wire. For the cover, I salt, and sensitise, and expose to light, and tone to a warm brown, two sheets of some strong paper, and finish off bound edge with a

strip of the same. Now just a touch of starch paste to each loose corner of print, and the book is finished.

Such a way of keeping prints has many advantages. Several hundred occupy a very small space; they will stand any amount of handling without being damaged or the cover showing finger-marks; the prints being bound into the book, no mountant is used, except at the two lower corners, hence they are not so likely to fade. I carried all my collection of prints everywhere when I was away in the south, and they were handled by scores of people; but they are in as good order to-day as when first printed. A description of each can be written on the page opposite the view.

In an out-of-the-way place like this one has none of the luxuries and advantages of a town, such as gas and water laid on and the like, but has to make all kinds of contrivances for himself.

I also go in for lantern slides, and reduce most of my views to lantern slides in the camera in a dark room, with hole in window for negative, and sheet of white paper outside. We have a Watson's lantern and a 12 × 10 sheet sized and whitewashed, which we erect in the stable yard on dark Saturday nights, and display to the astonished South Sea Islanders pictures of themselves larger than life size. They come from another plantation, sixteen miles away, to see it, and are never tired. They would stay all night if we kept it up.—I am, yours, &c.

D. Macfarlane.

Pioneer Estate, Lower Burdekin, viâ Townsville, N. Queensland.

[Our correspondent's letter was accompanied by several photographs of the natives of the New Hebrides, views in North Queensland, &c., which, considering the difficulties under which he has to work, are excellent in all respects.—Ed.]

MR. C. W. HASTINGS.—DISSOLUTION OF PARTNERSHIP.

To the Editor.

Sir,—Will you allow me to inform your readers that the partnership which existed between myself and Messrs. Hazell, Watson, & Viney, Limited, in connexion with their photographic publications, has been determined, and that I have no direct or indirect interest in the photographic publications issued from the offices of the *Amateur Photographer*, Messrs. Hazell, Watson, & Viney, Limited, having acquired all my interest by purchase this day.—I am, yours, &c.,

Charles W. Hastings.

Manor-road, Sidcup, Kent, August 27, 1892.

DECOLOURISING SHELLAC VARNISH.

To the Editor.

Sir,—You are perfectly correct in saying it is useless to attempt to decolourise shellac varnish by shaking it up with animal charcoal and setting in the sun. There are two or three points to be attended to in order to secure success. Firstly, the animal charcoal *must* be quite fresh, and recently carbonised; and, secondly, the varnish *must* be *boiled* with the charcoal, and not merely shaken up with it. Now, although this will not absolutely decolourise the solution, it will effect a *great* improvement; *the strong yellow colour will be removed*, and the resulting varnish will be a good, workable varnish, in which the colour that remains will be of little consequence in the thin film on a varnished plate.

I have found the following plan answer very well:—Procure a glass flask of, say, four ounces' capacity, put in half a pound of freshly burnt animal charcoal, then fill it about three parts full of the varnish to be decolourised; boil hard for a quarter of an hour or twenty minutes, cool and filter; sometimes half an hour's boiling will be required. The narrowness of the neck of the flask will prevent much waste. If this will not remove sufficient colour, boil it with a *fresh* lot of charcoal. The resulting varnish appears somewhat dark *in bulk*, but is not so in reality, as the bright orange colour will be destroyed.—I am, yours, &c.,

August 29, 1892. Edwd. Dexmore.

To the Editor.

Sir,—I have noticed from time to time what difficulties there seem to be in obtaining a clear solution of shellac without great waste. I have always succeeded by filtering through silver sand.

Have an ordinary tin funnel made in two parts, the upper part should have a piece of linen tied round at the bottom to keep in the silver sand, which should be clean and filled about half way; allow a little methylated spirit to run through before putting in the varnish, the deposit will accumulate on the top of the sand, and as it does so it can easily be removed by a spoon, and which will cause the varnish to run through quicker, the result will be a clear solution without waste.—I am, yours, &c., Arthur Bloo.

The Studio, Finborough road, Stowmarket, August 29, 1892.

THE DECAY OF PROFESSIONAL PHOTOGRAPHY.

To the Editor.

Sir,—It is the decay of the apprenticeship system that will ruin professional photography, as it is ruining many other businesses which require long and patient practice to produce experts.

These technical schools, where lads for a few shillings a quarter learn to cackle a garbled miscellaneous collection of chemical formulæ, flood the profession with a host of young fellows in their own estimation first class in everything, but, as I have found to my cost, really clever in no single branch of the business. Unfortunately some of the teachers in these technical schools are blind guides, who, having failed in business as photographers or chemists, eke out a precarious income by professing to teach what they know very little about.

You deplore the fact that a professional photographer does not personally execute his own operating, retouching, printing, enlarging, &c. A photographer's place is in his studio, and therefore, if he has anything like a business, it is impossible for him to do more than engage clever assistants to manage these departments, and see that the work is well and thoroughly done.

Notwithstanding your dictum, I maintain that *most* respectable photographers execute their own retouching, finishing, mounting, &c., on the premises, and do *not* give it out. A very large number also do their own enlargements. I have had a large experience of the pupils of these technical and polytechnic schools during my twenty-five years of professional photography, and I remember I foolishly engaged one assistant on the strength of the credentials he had from one of these institutions. He asserted that he was (amongst other things) a *first-class* operator, but I found he had about as much idea of making a graceful portrait as an Imbecile Hottentot. I was very gentle when I gave him his month's notice, because I thought, "It is not the fault of this poor youth, but it is through the folly of his parents, who did not apprentice him to a good photographer, when he would (if he had possessed ordinary intelligence) have been taught to be of some use."

Portraiture and photography are two totally different professions, only long and patient study in a professional studio can make a good portraitist. The tongue of the operator is as potent as the chemicals in making a successful portrait, and no technical teacher can impart to a pupil the tact a portraitist must acquire. Then, again, can the technical teacher take his pupil to picture galleries and exhibitions, and teach him what to copy and what to avoid? Can he set his pupil by the side of an expert retoucher and show him the negative the lad has assisted to take skilfully retouched? Can he send him into the printing-room and let a competent printer show him how to make the best possible prints from the negative? No, sir. It requires from three to five years to teach him all this, and he must be a clever lad to start with, into the bargain.

It is a significant fact that if I want a really useful assistant I have to train one myself, or else employ a young gentleman from the continent who has been apprenticed for a term of years with some good firm, and consequently is an expert at what he professes to do for his money.

And now, sir, let me point out the harm your article will do the profession. The amateurs whose name is legion all read the photographic literature; they will very naturally quote this article as an authority when consulted by non-photographic friends as to the best means of having their offsprings taught photography. The result will be that the tender suckling will miss the instruction he will need most, will ultimately start in business with a smattering of chemical knowledge only, will fail as a matter of course, will struggle on by working at starvation prices, and the premium which the photographer would have given good value for goes into other channels.—I am, yours, &c.

Augustus W. Wilson.

13*f*, *Dalston-lane, Kingsland, August* 30, 1892.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Samuel's Patent hand camera, two finders, holds twelve plates, perfect condition; exchange for 10 × 8 or 12 × 10 rectilinear lens.—Address, T., 7, Abercorn-terrace, Upper Holloway, N.

Will exchange Lancaster's 1891 Special Instantograph, two slides, lens, shutter, quarter-plate carrier, ash stand with adjusting top, complete in good condition, for safety bicycle.—Address, Howard Artiss, 91, Potters-hill, Aston, Birmingham.

Photographic Club.—September 7, *Enlarging*. 14, *Transparency Printing*. Outing, September 3, Finchley and Dollis Brook. 10, Greenwich.

Messrs. George Houghton & Sons have recently despatched to America a Moessard's pattern panoramic camera to take pictures 48 × 15, which is said to be the largest of its kind made, having taken several months to construct. The details of the instrument have been well thought out.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," 2, *York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & CO.," 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

William Vass Morris, Cork.—*Photograph of lugger yacht "Windfall."*

Edmund Smith Baker, jun., Birmingham.—*Photograph of Fire Escape.*

Richard Cobden Philips, Manchester.—*Photograph of Mrs. Alexander Ireland and Annie Elizabeth Ireland.*

FRANK WELLS.—The Autotype Company, of 74, New Oxford-street, W., undertake chromotypes.

JAS. B. ROSS.—You are precluded by the patent from either making the paper for use or from selling it.

T. WALLIS.—All materials for working photo-lithography, or zinc etching, may now be obtained from most large houses that supply printing material.

MECHANIC.—Apply to the Aluminium Company, Cannon-street. If they do not supply the castings, they will, doubtless, tell you where they may be obtained.

A. Z.—Your description of the defects is far too vague for us to form anything like a definite conclusion as to the source of the trouble. Send one or two examples.

EXHIBIT.—The Exhibition of the Photographic Society of Great Britain opens at the Gallery of the Institute of Painters in Water Colours on Monday, September 26 next.

D. C. MORGAN.—*Pure* zinc is several shillings a pound, but the ordinary metal, such as is used commercially for building and similar purposes, will answer quite well for reducing silver from residues.

C. BROWN.—If you do not succeed in getting satisfactory casts with paraffin wax, try plaster of Paris, using the finest kind. This may be obtained from those who make modelling in plaster a specialité, such as Brucianni's.

REX.—The drawing of the finder you submit is quite correct. When standing behind it, the sky of the landscape will be farthest away from you. A double convex lens of two and a half to three inches focus will answer quite well.

C. SOLOMONS.—If the business was sold under a misrepresentation, of course the purchaser is perfectly right if he repudiates the transaction or institutes proceedings for the return of the purchase-money. If he proves his case, he will certainly succeed.

F. SIMS.—There is no possible objection to using the 5×4 "rapid" lens for half-plate pictures, provided it will do the work. It will, however, embrace a wider angle than a lens specially constructed for half-plates, and thereby give a more violent perspective.

H. S.—It seems that the agreements are informally drawn, or rather not as a solicitor would word them, but that is not of much moment. It is usual to have one or more witnesses to attest the signatures. However, as the documents are not stamped, they are of no value.

J. C. DAVIS.—Within reasonable limits, the proportion of gold to sulphocyanide is not very material. You might safely replenish the exhausted bath with fresh gold for three or four times without the addition of sulphocyanide, when a fresh proportion of the latter would be advisable.

W. W.—Unless the colour of the paper upon which the engraving is printed is of a more or less yellow shade, there will be no advantage gained by orthochromatising the plates. The best plates for the purpose are those supplied for photo-mechanical purposes, or such as give great transparency in the blacks.

BEGINNER (Croydon).—A studio ten feet long and six feet wide will be of very little use, even for a beginner. If your means at present will not admit of building a larger one, it may be well to defer its erection for the present, and in the meantime, with the aid of a few curtains, utilise a shaded portion of the yard.

C. HURTMAN.—Stereoscopic transparencies backed with ground glass, are not suitable for use in the lantern, unless that be removed. Even then they are rarely so good as transparencies specially made for lantern purposes, as they are usually too dark. A transparency that is of the right density for the lantern will be too thin as a stereoscopic slide.

PROCESS.—If your only difficulty lies in obtaining electrotypes from the moulds, we should advise you, in the preliminary experiments, to take them to a practical electrotyper who is experienced in that particular class of work. When you have proved that the method is thoroughly practicable, and that it will yield good results, then give attention to the electrotyping part of the process.

R. MCCONCHIE.—1. All the troubles seem to point to impurities in the materials used, or uncleau vessels. If the former, the water particularly might be suspected first. Try making the toning bath with the ordinary tap water, that has been boiled for an hour or two and allowed to cool. The small amount of light the toning bath is exposed to would not account for the trouble. 2. Better use an emulsion paper if a surface with a fine gloss is desired. This is not to be obtained on drawing-paper when squeegeed on glass. One of the photographic papers, Saxe or Rives, should be employed if a surface giving the finest detail is desired. When an emulsion is prepared, it should be used withiu a short time of preparation, and not kept in stock.

F. E. G.—1. To copy an object so that the photograph shall be the same size as the original, it is absolutely necessary that the camera shall be extended to twice the solar focus of the lens. It may be necessary for you to add a small piece to the camera front so as to get the lens farther from the ground glass. 2. Probably air bubbles or impurities in the hypo. Try a different sample of the latter, or use a pledget of cotton-wool with that which you are using.

REFLECTOR.—1. The image thrown on the horizontally placed ground glass will be of the same dimensions and sharpness as if it were received at the end of the camera. 2. In taking portraits by the aid of a mirror, as described, while it would be theoretically better that the silver should be deposited on the front of the glass, in practice it is advisable that it should be protected by the glass, as the double reflection causes no inconvenience, owing to the feebleness of that from the front surface. 3. By bringing the lenses of a rapid rectilinear nearer together, whether it is done by rackwork or otherwise, a larger field of illumination will be obtained, at the expense, however, of roundness of field. We would strongly advise you not to effect such an alteration of the mount, especially if the lens be a good one.

A COUNTRY PHOTOGRAPHER writes: "I have a series of copyright photographs, and last year gave permission to the editor of a leading monthly publication to reproduce certain of them to illustrate an article in that publication, under the conditions that my name appeared under each as the photographer. This was done. I find that this year, in another publication by the same publisher and on a similar subject, these photographs have again been used, entirely without my knowledge and sanction, and without my name appearing in any way. Will you advise me as to the best course I can take in the matter?"—It appears to us that you, although having given permission to use the photographs for a certain purpose, under certain conditions, does not entitle the same or any other person to use them for any other purpose whatever, except with your permission. Your remedy is to proceed against the parties for infringement of copyright. But, before doing so, we advise you to consult your solicitor. You can, however, do no harm in writing a formal letter to the offending parties for an explanation.

T. W. EDWARDS says: "During the past week I have experienced great trouble with my silver bath, and appeal to you to help me out of the difficulty. My silver bath has worked well for a considerable time now, and my batches of prints would tone within twenty minutes, but now I cannot get them to tone beyond a reddy-brown, bleached-out colour, although I have tried a new toning bath. Silver bath does not seem to be acid. I have put carbonate of soda in it, and have filtered also. The solution, after standing, is quite clear, and I am at a loss to know what can be the matter with it. My toning bath is the ordinary acetate bath, which I have worked for years with success. Silver bath I keep up to sixty grains, with kuloin in it, and add a little carbonate of soda twice a week."—Supposing no change has been made in the kind of paper used, there is little doubt that the silver bath is too weak. The argentometer is not always a reliable test with baths that have long been in use. Make up a small quantity of new bath, sixty grains to the ounce, and sensitise a little paper on that, and see the result.

S. W. B. writes as follows: "Would you give me an answer to the following difficulty? I have three bromide prints, which I value highly, and, as the negatives have been hopelessly spoilt, I cannot produce copies of them. They are all of small size (quarter-plate), and, though I nave tried copying them in the camerr, I can get no satisfactory result. Is there any process by which I can free the film from the paper, and then transfer it to glass? I have not dared to try hydrofluoric acid, as I was afraid it might not act on paper positives."—There ought to be no difficulty in copying the pictures in the camera. It would be very risky to attempt to strip the gelatine film from the paper, and, if it could be successfully accomplished, the operation would be troublesome and to little purpose. Hydrofluoric acid would not assist. If the prints are unmounted, they might be used, perhaps, for printing on to a dry plate, with a view to making a fresh negative that way. But the best result will be obtained—and this ought to be nearly equal to the original—by copying the prints in the camera. Try slow plates, and do not over-expose.

LEYTONSTONE CAMERA CLUB.—There will be informal meetings on September 3, 10, 17, and 24.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—Next Meeting, Tuesday, September 6. Subject, *Comparison of Holiday Work.*

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.—Mr. Chapman Jones, the Hon. Sec., writes:—"Will you kindly remind your readers that Wednesday, September 14, is the only day for receiving exhibits at the gallery for the exhibition of the Photographic Society of Great Britain, and that exhibits may be sent at any time up to September 13 to our agents? Full details can be obtaiued by application to the Assistant Secretary, 50, Great Russell-street, Bloomsbury, W.C."

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1688. Vol. XXXIX.—SEPTEMBER 9, 1892.

AMIDOL.

New developers not infrequently suffer in public estimation from a failure on the part of their introducers to indicate with sufficient exactitude not only the precise nature and the proportions of the developing solutions of which the new substance is to be a constituent, but also in respect of the great and far-reaching claims which are urged on their behalf, without anything more than the results of a few private experiments to justify or attest them. Naturally inventors are prone to look upon the efforts of their skill with a favourable eye, a view which experience has over and over again shown that an impartial public has failed to ratify; and thus perhaps we can understand how it is that, in the case of new developers, the rivals which were confidently expected to drive pyrogallol from the field have so far failed to effect that purpose. This, however, is no denial of the valuable properties which, under certain conditions, hydroquinone, eikonogen, and para-amidophenol undoubtedly possess.

Amidol, so far as we are aware, has not been heralded by any considerable flourish of trumpets implying that it is to revolutionise development; and thus, whatever the final place it has to occupy in the photographic formulary, it will be safe to conjecture that it will neither create nor perpetuate a sense of disappointment. Early as it is, however, we are inclined, both from our own and the experiences of others, to forecast something more than a transitory popularity for amidol. As our readers have already been apprised, it is a developer *per se* —that is, the use of an alkali with it is unnecessary, although it is only in the presence of sodium sulphite, which practically performs the office of an accelerator, that its full developing properties find sufficient scope to be practically utilised. In our brief allusion to it of August 12 we indicated the chemical composition of the new reagent, although possibly that is merely its theoretical formula, so that, under analysis, it might give a somewhat different reading of the equation. This, however, is merely conjecture.

Those responsible for the introduction of amidol as a commercial article in this country are to be congratulated upon having provided a formula for its employment which, both in our own and others' hands, requires little or no modification in order that the principal properties of the new developer may be deduced from experimental use. It is, in fact, on that account easier to institute comparisons of the new substance with, for example, pyrogallol, than it was to accurately compare hydroquinone or eikonogen with that developer. We have not found it necessary to vary the proportions of the stock solution of 20 parts amidol, 200 parts sodium sulphite, in 1000 parts of water, with which our first trial of the developer was made, and can therefore recommend those of our readers to adhere to these proportions.

The first question which arises in considering the properties of a new developer is, what are its advantages or disadvantages as compared with pyrogallol — still, in all probability, the standard developer for negative work, and probably the most effective? We may at once state that amidol, practically considered, has no discoverable disadvantage compared with pyrogallol, while as to its positive properties we are disposed to consider it as perhaps the most dangerous rival which pyrogallol has thus far had to encounter. Used in a strength of three parts of water to one of the stock solution above described, its rapidity of action upon a correctly exposed plate is remarkable, weakening by dilution appearing neither to retard its rapidity nor decrease its energy of attack in anything like the same degree as with other developers. Used without bromide, however, it appears to us to have a tendency to set up a surface veil, even with correctly timed negatives and development retarded by dilution, and thus we find the invariable employment of a small quantity of bromide—about one-eighth of a grain to the ounce—as decidedly advisable of course increasing the quantity as development progresses in accordance with requirements.

With that small addition of bromide, the image has all the best characteristics of one developed with pyrogallol in collaboration with an alkaline carbonate, the finer details being perfectly rendered, while the control of density is so thorough that, given proper exposure, with a developing solution such as we have specified, practically any degree of intensity is obtainable with little prolongation of development beyond the normal period. Dried negatives very closely resemble pyro-developed *clichés* in colour, but are much clearer and freer from stains, inasmuch as the solution undergoes little, if any, discolouration during use. Indeed, we have left some in an open graduate for several hours without observing any change in its appearance, although at the end of a day a rapid degradation of colour supervened, with, at the same time, an almost total loss of developing power. On the other hand, amidol's conservation of developing energy in a solution in actual use is exceptional, for, in submitting ten plates to the action of one developing solution, we found that the difference in time occupied by the first and tenth plates was so small as to be neglected. In brief, amidol appears to render vigorous, yet harmonious and soft, negatives of a pyro-like character, with the advantages that it is quicker, cleaner, more energetic, and more economical than the older reagent.

Without going so far as to class amidol as a universal developer, we are persuaded that it has great possibilities for paper positives, inasmuch as on bromide paper it yielded us results quite the equal of those given by eikonogen, that is, the colour of the image was of a warm black, with the shadows free from clogginess, and it did not discolour the whites. For lantern slides it scarcely appears so well suited, since, while the colour of the deposit is not so rich as is generally desired, it seems a little difficult to escape a certain veil which detracts somewhat from the brilliancy of this class of picture. We do not doubt, however, that further experience will obviate these slight defects.

On the whole, we lean to the opinion that amidol is a valuable addition to modern developers, with certain advantages of its own, which place it at least on an equality with each or any of its rivals at their best. A point greatly in its favour is its easy solubility in water, and it should, in conclusion, be pointed out, that not only is the addition of alkalies needless, but that the latter practically destroy the developing properties of the amidol-sulphite solution, while as restrainers the organic acids sometimes used for that purpose have no advantage over plain potassium bromide.

FINISHING GELATINE PRINTS.

Few of those who regularly employ gelatino-bromide or chloride papers have become so completely diverted from the old style of albumen print, with its glassy surface, as to be satisfied with the comparatively rough surface of the modern gelatine print, for small work at least, when it is not glazed or finished by transfer from a glass or other polished surface. At the same time, many complain of a difficulty in securing the necessary finish, and speak in unkind terms, consequently, of an otherwise satisfactory style of print.

And yet the process of enamelling or glazing the prints is one of the simplest and easiest it is possible to have to perform if only a few plain rules and precautions are observed, for which reason we are inclined to think that at least the greater part of the trouble complained of is due to some carelessness on the part of those concerned, or possibly to a want of knowledge of the details of the process. In the latter belief, therefore, we propose to give simple details of the manipulations in the most practical methods of procedure.

The old style of enamelling silver prints consisted in cementing the prints in contact with a collodionised sheet of plate glass, from which, when dry, it was stripped, bringing with it the film of collodion, and presenting a surface equal in brilliancy to that of the glass itself. In the more modern methods the preliminary film of collodion has been dispensed with, and, the polished surface of glass or other material having been suitably prepared, the print is squeegeed directly into contact with it and left to dry, when it can be stripped with the greatest ease and carries a surface little, if at all, inferior to that obtained when collodion is employed.

It need scarcely be said that the older and more elaborate method is the superior so far as stability of result is concerned, or that the collodion film adds materially to the permanence of the photograph itself by forming a transparent protective layer on its exposed surface. Where the extra trouble is of no consequence, therefore, that method will, no doubt, be adopted, but for ordinary purposes the simpler plan will usually answer every requirement.

Briefly, the method as employed with albumen prints consisted in bringing the two surfaces of albumen and collodion into intimate contact, each having first received a coating of colourless and clarified gelatine to cause perfect adherence. With gelatine prints the procedure is identical, except that in many instances the adhesive may be omitted. This is more especially the case with "printing-out" papers whose gelatine surfaces, being mostly unhardened by either alum or the action of development, prove sufficiently adhesive in themselves without any extraneous acid. With developed prints, and in some cases with the undeveloped, where alum has been used in the manufacture of the films, it will be found safer to employ the adhesive, in order to be certain that the surfaces shall adhere in every part, a thin solution of gelatine answering the purpose.

The first step in the process consists in thoroughly cleaning the glass, which should be perfectly free from scratches or flaws, each of which would be faithfully reproduced on the surfaces of the print. The cleaning is done with alkali, followed by copious washing in clean water, after which the glass is dried and polished with a soft linen rag. In place of glass it is now the practice frequently to substitute sheets of polished ebonite or ferrotype plates, which have the advantage, partly owing to their flexibility, that they allow the prints to strip more easily. These must be as scrupulously cleaned as the glass.

The final treatment of the temporary support, previous to collodionising, is to polish with a solution of wax in benzole, chloroform, or ether, or, as many, including ourselves, prefer, with powdered talc or French chalk. The wax solution is made by dissolving a small quantity of pure beeswax in one or other of the solvents named, which must be perfectly free from grease. A little of this solution is poured on to the glass or other support, and rubbed well into the surface, and then polished off with an old silk handkerchief. If French chalk be used, it must be dusted pretty freely over the surface, and then polished off until no traces of it are visible.

The collodion to be next applied is made by dissolving from six to eight grains of good soluble gun-cotton in an ounce of a mixture of equal parts of alcohol and ether. A suitable sample of gun-cotton can be obtained for not more than a shilling the ounce; methylated ether of s. g. ·720 is the correct thing to use, and we have found no detriment to arise from the employment of the new "mineralised" methylated spirit, provided its strength is not lower than ·825. The collodion is poured on to the glass or other support in the ordinary manner, allowed to set, and then immersed in water until the latter flows freely and evenly over the surface without apparent greasiness; it is then ready to receive the print.

In the case of the softer kinds of printing-out paper, no preparation of the surface of the print is necessary, all that is required being to bring print and collodionised glass into contact while both are under water, so that no air bubbles are enclosed between the two surfaces. On drawing them out of the water bath, simple pressure beneath several folds of blotting-paper will ensure perfect adhesion, or, if preferred, the squeegee may be used. If the gelatine surface of the print has been hardened by alum, or by development, it will be advisable to apply an adhesive, which may consist of a ten-grain solution of gelatine, of course used warm. The print having been floated on this solution, and a plentiful supply of the latter having been poured on to the collodionised glass, the two surfaces must be brought together in such a manner as to avoid air bubbles, and the surplus gelatine squeezed out by means of the squeegee, and the whole then left to dry.

When the simpler plan is used, and the collodion film dispensed with, success depends principally upon the proper preparation of the surface of the print. The support, and in this case ebonite or ferrotype plate is preferable to glass, is prepared in the same manner as before, up to and including the polishing with wax or talc. The print is prepared by a thorough "aluming," that is to say, it must be immersed for some minutes in a saturated solution of alum, followed by a good washing, after which it is brought into contact with the prepared support, under water as before, and otherwise treated as already directed. Should the gelatine surface exhibit any tendency to adhesiveness, the two surfaces may be brought together in a mixture of equal parts of alcohol and water, which, by further hardening the gelatine, will destroy its tendency to stick.

The prints, when quite dry, will strip easily from the support if a narrow strip be cut off each edge with a sharp knife, which is then inserted under one corner of the picture, and then stripped off by means of a firm and steady pull.

As the glaze is lost if the print be damped after stripping, it is necessary to mount it while still in contact with the support, or to make arrangements for its mounting without loss of gloss. In the first case the flexible support proves extremely convenient. The print is trimmed to size *in situ* and carefully covered with mountant, the mount itself being then placed in position, and the whole put under gentle pressure until dry, when mount and temporary support are easily separated. If the mounting is to be performed after stripping, it will be necessary to apply to the back of the print by means of gelatine, while still on the support, one or two thicknesses of even white paper. This will convert the print when stripped into a sort of thin cardboard, which will admit of the edges being tipped with gelatine, and the print mounted without cockling or loss of gloss.

A very neat method of mounting we saw in practice some time ago is worth describing. A number of ferrotype plates, having been cut to the exact size of the print when mounted, were cleaned and prepared by polishing with ordinary vaseline. The prints, having been squeegeed in contact, were trimmed down to the size of the supports by means of scissors, and while still damp the mountant was applied, and the prints with their supports placed in position on the mounts, and pressure applied until dry. The flexible ferrotype plate was then easily removed, leaving the print with a beautifully enamelled surface. The use of vaseline appeared to us to be a valuable improvement upon either wax solution or powdered talc.

PHOTO-ZINCOGRAPHY.

From remarks we from time to time hear, and from queries received of late, with reference to photo-zincography, it is clear that not a few are under quite a misconception as to what is photo-zincography. The queries, as put, more often than not refer to another process in which zinc forms the printing matrix. What is so often confused with photo-zincography is the zinc etching, or, as it is more frequently termed in the trade, the "zinco" process. The two processes are totally different both in principle and in practice. The one is for the production of blocks in relief for printing in the typographic press, whereas the other is a surface-printing method by which the impressions are obtained after the manner of lithography. With a view to clearing away this confusion, we shall give a brief description of the photo-zincographic process proper, when it will be seen how widely separated it is from the process with which it is so often confounded, even by some who work it or are experimenting with it, while, at the same time, it will also be seen how very closely photo-zincography is allied to photo-lithography.

It may be explained at once that the practice of photo-zincography, like that of photo-lithography, is principally confined to line subjects. The former process, it may also be mentioned, is not worked commercially, or ever has been, to the same extent as the latter. Why this is the case it is somewhat difficult to surmise, unless it be that this class of work has principally gone into the hands of lithographers who were more familiar with the manipulation of stone than zinc. It is quite conceivable, however, that had the commercial working of the process in the first instance been taken up, as it really ought to have been, by photographers, as the essential parts of it are purely photographic, the metal would have been preferred to stone. The process is, however, extensively employed for the production of maps, and for other purposes where fineness and delicacy of detail are necessary. All our ordnance maps, for instance, in which, of course, extreme fineness is an essential, are produced by this process, and so are those of some foreign and colonial governments.

Zincography, like lithography, as most are aware, is based upon the antagonism of grease and water, and that the first thing to do is to obtain the photographic image, whatever it may be, in a greasy material. For this purpose advantage is taken of chromated colloid substances, which it is tolerably well known to all our readers become insoluble, or non-absorbent of water, on exposure to light. In the early days of this class of work the sensitive body was applied to the metal or stone, and that exposed direct behind the negative. This system obviously was attended with great disadvantages. Pressure frames containing large metal plates or stones were, it is needless to say, very inconvenient to handle, and, moreover, a difficulty was found in getting perfect contact with all portions of the image. After a time this system was abandoned for the transfer method—the one now universally employed.

There are several different ways of producing the transfers, each of which has its advocates, though all are based upon the same principle. One method is to coat a fine surface paper with albumen, gum arabic, or other similar substance, or a mixture of two or more of them, containing bichromate of potash or ammonia. When this coating is dry, the paper is exposed behind the negative until a strong image is obtained on the pale yellow ground. The paper is then coated uniformly with a fatty ink. Specially prepared photo transfer ink is now supplied by all large dealers in printing materials, and this thinned with turpentine answers very well, though some workers still prefer to make their own transfer ink. After inking, the paper is floated on cold water, which dissolves the coating where the light has not acted, bringing the ink away with it and leaving the design perfect in ink on the hardened colloid material.

In place of employing gum or substances soluble in cold water, gelatine is more generally used. It always is at the Ordnance Survey Office, Southampton. When the image is printed and the paper inked up, it is floated on tepid water until the unacted-upon-by-light portions swell up, then the coating is treated with hot water to dissolve them with the ink away. Hence the same end is arrived at as when albumen

or its analogues are used—namely, the lines in greasy ink on a hardened colloid body with bare paper for a ground.

Instead of treating the inked-up print, after soaking in cold water, with hot water, the ink is by some workers removed from the unexposed portions by gently rubbing with a soft sponge or brush and copiously washing with water. When the unacted-upon gelatine becomes saturated with water, it has no longer any affinity for the greasy matter, while those portions that have been exposed to light still hold it tenaciously. Here is another method. In place of inking up the print direct as it is taken from the negative, it is soaked in cold water and then blotted as dry as possible. Then the ink is applied, when it adheres only where the light acted. It will be seen that in the two latter methods the colloid film remains intact on the paper, while in the former ones it exists only where it has been modified by light.

With regard to the application of the ink to the exposed film, there are several ways of doing this. Some prefer to use a dabber, some a soft roller, such as the velvet roller, while others apply an even layer of the ink, in the first instance, to a zinc plate or a lithographic stone, and then pass the undeveloped print several times through the litho press in contact with it. By whatever means the fatty image is obtained, the after-operations of transferring and printing are the same.

After the transfer has been dried it is placed between sheets of damp blotting-paper until it has become quite moist. A zinc plate, that has been planished and finely ground, and made perfectly clean, is placed on the bed of a lithographic press. The moistened transfer is then laid upon it with a few sheets of paper as a backing. The whole is then passed several times through the press, the pressure being increased each time. Next the back of the transfer is wetted with water and the paper taken off, leaving the ink forming the image firmly adherent to the plate. After washing with water, to remove any adherent fibres of paper, the surface of the zinc is treated with dilute phosphoric acid, gum arabic, and nut galls in water. After remaining on for a few seconds this is washed off, and the plate is ready for inking up and printing from, either in a hand or a power press, just as if it were a lithographic stone.

From the above brief description it will be seen how widely different is photo-zincography proper from what is commonly known as the "zinco process," and also how closely it is allied throughout all its manipulations to photo-lithography, so much so, that it becomes practically identical with it, except that metal is employed in place of stone.

Mention was made in an early part of this article that zincography is less extensively employed in commercial work than lithography. This may possibly, to an extent, be accounted for by the fact that less skill is required in printing from stone than from zinc; though it is claimed for the metal that in skilled hands it yields finer and more delicate results than can be obtained from the stone.

Camera Club.—The winter indoor meetings of the Camera Club will recommence early in October, when a new Exhibition of photographs will be opened. It is intended to gather two or three examples from each of a number of prominent photographers, to be selected as far as possible by the exhibitors themselves from recent work. The premises of the Club are at present in course of redecoration.

The Admiralty and Scientific Expeditions.—We are sorry to hear a rumour that the Admiralty have refused to render any assistance in carrying the observers and instruments for which the Royal Society made application some time ago to further the observations of the total solar eclipse in Senegambia next April. We presume, if the rumour be correct, there will be no expedition.

A Strong Solution of Ammonia.—The common aqueous solutions of ammonia are sufficient for all ordinary purposes, but cases arise where an alcoholic solution is needed. The drawback to this latter is the fact that it contains so much less ammonia than the aqueous solutions. Thus, at 58° F., an alcoholic solution of eighty per cent. (and that is weaker than ordinary rectified spirit) will only hold nineteen per cent., while the familiar solution contains, when of full strength, over thirty-two per cent. Methyl alcohol, however, dissolves an enormous quantity. According to M. J. Delépine, he states in a technical journal that a purified commercial alcohol containing less than three per cent. of acetone dissolves forty per cent. of its weight.

Photographs of Bees.—Mr. T. E. Freshwater recently showed us several of his excellent photographs of bees, which, while undoubtedly of peculiar interest to bee-keepers, are of scarcely less account from a purely photographic standpoint. The photographs, of which there are several, illustrate various phases of bee culture as conducted by Mr. Broughton Carr, a well-known apiarian, such as hiving, catching the queen, and many other operations involving the manipulation of a swarm of bees, numbering probably many thousands. A set of lantern slides has also been prepared, which, judging by the well-defined appearance of the masses of bees under the magnifier, should be highly successful on the screen. We understand that the photographs have aroused much interest among the members of the British Bee-keepers' Association. One of them shows a number of bees crawling over Mr. Carr's hand.

Cyanide of Potassium.—Dr. Kayser, of Nuernberg, recently read a paper on this substance before a meeting of the Free Association of "Bavarian Representatives of Applied Chemistry," which, though not specially photographic in substance, is yet interesting as increasing our knowledge of a well-known chemical. He states that the so-called potassium cyanide of commerce usually contains a very large proportion of sodium cyanide. He points out that this impurity is of technical importance in preparing galvanic gold baths, the potassium auro-cyanide being very soluble, while the sodium salt is sparingly so. The query presents itself, what would be the effect of a greatly over-printed silver print strongly toned with gold, and then submitted to the action of cyanide of sodium alone? In the new edition of Watt's Chemistry, the auro-potassium cyanide is described, but the sodium salt is merely referred to.

Wire Glass.—Under this name a new material has been put upon the market, and there seems no reason why it should not be used for many photographic purposes if it can be turned out of the required substance and clearness. The process of manufacture consists in furnishing glass in a hot, plastic state with a flexible metallic layer—iron wire netting, for instance—which is completely enclosed by the vitreous substance, and effectively protected against exterior influences, as rust, &c. The new glass is very strong and tough: it may be heated to a high degree, and then sprinkled with cold water without being materially damaged. The glass has been successfully applied to the manufacture of hollow glassware, it being particularly suitable for making vessels which have to be subjected to rough usage. Such vessels, if not too costly, should be most suitable for dark-room use, where the usual glass measure meets so often with disaster.

Stellar Magnitudes.—The question of star magnitudes is one of paramount importance in the great work of the universal star map, of which we have heard so much, and the method of ascertaining these magnitudes has given rise to much discussion, not to say controversy. In the *Astronomical Journal*, No. 269, the results of Mr. J. M. Schaeberle's work is given, and he has adopted a method differing considerably from those used by former observers. In his

plan the photographic magnitude of a star for any exposure time is expressed "as a fraction of the theoretical aperture which a standard star (*Polaris* in this case) would require to make the same impression on the plate in the same time." The particular form which the expression, as obtained from this investigation, assumes enables the observer, after having once adopted the photographic magnitude of the standard star, to determine the theoretical photographic magnitude of any other star without any reference at all to the visual magnitude.

Dark-room Measures.—In the direction of measures for dark-room work, there have, for some time past, been before the public these articles, constructed of white glass, with a slip of clear glass for noting the contents. Our own experience of them is not favourable. They certainly are not readily lost or lost sight of in the dim light of the room; but, unless the light be strong, it is not easy to measure the contents when pouring any liquid into them. The wire-glass vessels just mentioned would be very useful made jug shape and with coarse graduations. Clear white glass jugs graduated to half-pints are now purchasable, and are very useful for mixing batches of liquid, but in the average dark room are difficult to see when lying about, and are thus apt to get knocked and broken. A plan for treating measures, before described in these pages, consisting of painting a rim of white paint around them, might with advantage be carried out with these larger jugs. We would suggest a white rim round the outer margin or mouth, one round the middle of the jug, a complete coating of paint covering the whole bottom of the jug —all outside, of course. One photographer of our acquaintance uses the earthenware medicine measures for small quantities, as being more readily seen. It has been suggested by a well-known professional that white earthenware jugs, broad-mouthed, and marked inside like the small medicine glasses but only with half or quarter-pints, would be very valuable, and we are inclined to think with him, as, when pints and quarts of solutions are dealt with, the graduation would suffice, and the convenience and ready visibility of a white vessel with a handle need not be dilated upon.

CHLORIDE PRINTING-OUT PAPERS—COLLODION AND GELATINE.*

II.

Amongst the different makes of commercial gelatino-chloride paper there is found a considerable difference in keeping qualities; indeed, the same brands are often found to vary pretty materially in this respect, although not to the same extent. This result may be, and most likely is, due to variations in formula; but not wholly so, for the amount of moisture in the paper, or its state of dryness when first packed, forms perhaps the most important element in deciding its keeping qualities.

In the matter of permanence or capacity for retaining its quality unchanged, gelatino-chloride printing-out paper differs very materially from plates or, indeed, from any films on whatever support—glass, paper, or celluloid—that are intended for development. The latter contain only insoluble silver salts, being, if properly prepared, freed as perfectly as possible from all other matters of a soluble nature, including, of course, the decomposition salts formed in the process of emulsification. In the printing-out papers, however, there exist, in addition to the silver chloride and possibly other haloid, varying proportions of soluble salts of silver, free acid, as well as the whole of the soluble nitrates and citrates formed in the emulsion; and it is worthy of note that most of these, especially the citrates, are of a highly hygroscopic nature, and consequently extremely prone to cause the sensitive paper to absorb moisture, if the chance arises.

The necessity for thoroughly drying the paper in the first place, and of packing it in such a way as to secure it from damp afterwards, must then be patent; but, such precautions having been taken, there seems no reason why the gelatino-chloride papers should not keep their purity of tint unchanged for an indefinite period. I am led to this conclusion from having noticed frequently during the past few years that a gelatino-chloride emulsion, although containing a considerable excess of silver nitrate, never seems to discolour with keeping so long as it remains at a normal temperature, or, at least, is not frequently heated to much above 100° Fahr. It may become permanently fluid from decomposition of the gelatine, though even in this respect it is not so liable to change as an ordinary negative emulsion, but it will continue to exhibit for months the delicate bluish-white tint of the pure citro-chloride emulsion, or the more creamy-white conferred by some of the other organic silver salts, without the slightest degradation. I make the reservation I have done with regard to temperature because some of the organic silver salts, as well as the carbonate, are subject to spontaneous discolouration if the temperature be raised very few degrees above the melting point of the emulsion; indeed, it is almost impossible to keep an emulsion containing carbonate of silver liquid for any length of time without causing discolouration.

The fact of the keeping capacity of the emulsion itself is, of course, evidence in favour of the permanence of the paper, though it does not follow as a matter of necessity that the coated paper will keep as well as the emulsion itself. The latter, however it may be preserved in bulk, is, as a matter of course, protected and kept free from impurities and foul air, except perhaps on its surface. The body of the emulsion has only the action of its constituents upon one another to reckon upon, whereas, when it is spread upon paper, there are the possible impurities of the paper as well as atmospheric influences to be taken into account; and, looking at the hygroscopic character of the emulsion itself, the chances are greatly in favour of such accidental influences asserting themselves to their utmost power.

In preparing the emulsion, then, with a view to the keeping qualities of the coated paper, every care should be taken to avoid as far as possible those conditions that tend to give it a hygroscopic character. The requirements of the printing-out film make it impossible to altogether avoid the tendency; indeed, a certain amount of dampness, or rather a slight departure from a condition of absolute desiccation, appears to be a necessity in this as in some other printing processes. But, at least, the hygroscopic tendencies may be kept down as low as may be compatible with proper printing quality; and, in speaking of those, I refer also to other conditions, such as free silver, which, combined with the presence of moisture, lead to the deterioration of the sensitive film.

The gelatino-chloride emulsion for "printing out," as usually compounded, contains besides chloride of silver a certain proportion of citrate, free nitrate of silver, free citric acid, together with the products of the decomposition that goes on in emulsification, namely, alkaline nitrates, and, in many cases, alkaline citrates, the latter being used in too large a proportion. Now, of these, three at least possess decidedly hygroscopic tendencies, namely, the citric acid and alkaline citrates, as well as the soluble alkaline nitrates—at least, those usually present, those of ammonium and sodium. The nitrate of silver, by its presence and ready solubility, is always a danger to the keeping of the paper, while the citric acid exercises a very similar action to that already mentioned in treating of collodio-chloride, in causing the emulsion to become thick and ropy, and eventually to altogether lose its fluent properties. It should therefore be the endeavour to reduce the proportions of each of these to the lowest limit possible.

The ideal printing-out emulsion is usually supposed to consist of chloride of silver as the basis, with just such a proportion of silver citrate and nitrate as will confer vigour and colour, and citric acid to make it keep. The remaining soluble constituents are "necessary evils" which in the really "ideal" emulsion might be dispensed with if it were possible. Such an emulsion might possibly be formed by emulsifying precipitated citrate of silver and adding hydrochloric acid, to convert the necessary proportion of silver into chloride, citric acid being at the same time liberated, while it would only remain to add the requisite quantity of free nitrate of silver to complete the emulsion. I have, in fact, made such an emulsion, but unfortunately it possesses none of the qualities of colour that are required, hence we may steer clear of the theoretical idea.

Citrate of silver, we are told in the text books, is thrown down as a white precipitate on mixing solution of nitrate of silver and an alkaline citrate, from which it is assumed that citrate of silver is insoluble in water. How far this supposition is correct may be proved by mixing moderately strong solutions of nitrate of silver and citrate of potash, when it will be found that, though a dense white precipitate is formed

* Concluded from page 495.

at first, it is quickly dissolved on agitating the mixture, either partially or wholly, according to the degree of concentration. As a matter of fact, citrate of silver is freely soluble in water, especially when warm, and this partly accounts for the extreme translucency of citro-chloride emulsions, even when they contain a large proportion of silver. To prepare and collect citrate of silver by precipitation from aqueous solution is therefore practically out of the question. It may be obtained, though with much trouble, by precipitating alcoholic solutions; but the best plan consists in dissolving freshly precipitated oxide of silver by boiling in alcoholic solution of citric acid until the brown colour is entirely removed, decanting the clear liquid and washing the white precipitate with fresh alcohol. Citrate of silver, it may be said, is not discoloured by heat, for which reason I prefer it to any of the other organic salts of silver.

If any reader should desire to try the ideal plan of compounding the emulsion, that is to say, of starting with an emulsion containing only chloride and citrate of silver, the following will, I think, be the best way of doing it. First of all, prepare two separate emulsions, one of pure chloride, the other of pure citrate of silver. The first is easily made by Monckhoven's process, with carbonate of silver and hydrochloric acid; the second by emulsifying or dissolving citrate of silver, prepared as directed above, definite quantities of silver being used in each case. In this manner it will be possible to prepare, by mixing suitable proportions of each of the separate emulsions, one of citro-chloride, in which the quantities of the two silver salts bear any desired relation to one another, and it will thus be perfectly easy to study the effects produced by varying the proportions, while keeping clear of any complications brought about by the presence of any of the other salts usually existing in an emulsion prepared in the ordinary way.

Such an emulsion, in its simplicity, would be of little practical use for picture-making, but, as a means of studying the relative effects upon sensitiveness and vigour of image produced by increasing the proportions of one or other of the ingredients, it proves invaluable; and, by the subsequent addition of other of the materials already mentioned as necessary in the finished emulsion, the requisite proportions of the different salts for an emulsion of any kind could soon be arrived at with accuracy. Thus we know that gelatino-chloride paper can be prepared to suit either dense or thin negatives as may be required, to give dense, vigorous images, or the reverse; in fact, to suit any particular class of circumstances or any kind of work. These variations are mainly produced by modifying the proportions of the sensitive salts and the free silver to one another, and to the gelatine in which they are suspended, while the colour of the image, and its susceptibility to toning agents, depend more particularly on the soluble silver salt, and the presence of a certain proportion of moisture and acid. The keeping qualities of the emulsion and film are supposed to be dependent on the presence of free acid, and to some extent this may be the case; but on that point I shall have more to say later on.

With regard to free silver, it is usually supposed that an excess of nitrate of silver is a *sine quâ non*, but, heterodox though it may seem to say so, I am strongly of opinion that this is not the case. The function of the free or soluble silver is to form an organic compound with the gelatinous basis of the emulsion, a compound which plays the double part of giving vigour and colour to the image while the inorganic element gives sensitiveness. Bearing this in view, and also the fact of the solubility of citrate of silver in water or in solution of gelatine, it is not unreasonable to believe that the latter salt can be made to perform all the functions of free nitrate, while it is not so liable, by reason of its lower degree of solubility, to enter into dangerous combination, either in the emulsion itself or with any impurities in the paper or other support. True, we may expect the relative actions of the nitrate and citrate to differ at least in degree, and perhaps also somewhat in character, but in the main we may expect somewhat similar behaviour from them. In proof of this it is possible to make an emulsion in which there is not a particle of unconverted nitrate of silver, and which still yet prints in every way as well as any of the commercial papers now procurable.

The lower degree of solubility of the citrate of silver, which renders it less susceptible to the influence of accidental moisture, cannot fail to react on the uniformity and keeping qualities of the dried film, and on that account, if no other, it may be put forward as a recommendation to eschew the use of free silver altogether.

Turning to the question of free acid, here again I am constrained to express the opinion that for the purpose of increasing the keeping qualities of the film it is entirely unnecessary if the film be properly dried and protected from damp. I am not prepared to deny that, in case these conditions be neglected, a trace of free acid may be an improvement, my contention simply being that it is not a necessary improvement; while, as in another direction it exercises a deleterious action, it is as well to dispense with it if possible. I have never managed to make a sufficiently accurate and extended trial of the relative keeping qualities of acid and neutral papers, but I have in my possession at the present time emulsions that have never contained free acid, and one which is actually alkaline, and, though several months old—probably eight or nine—not one of them has shown the least sign of discolouration. This is surely evidence in favour of my contention that under proper conditions acid is necessary.

Many people are under the impression that, by adding citric acid to an emulsion containing free nitrate of silver, citrate of silver is formed; but such is not the case. It is difficult to say what is the precise state of affairs; but, though an effect is produced which slightly resembles that of actual citrate of silver, it is very certain that citrate is not formed. One result, however, of the addition of the citric acid is to cause the emulsion to be very thick and to set at a very low temperature, or at least to become so thick, unless a high temperature is maintained, as to render it impossible to spread it evenly upon either paper or glass. If, however, a few drops of dilute ammonia be added to such an emulsion, it at once becomes thinner or more fluent, while the film produced by it is proportionately denser or richer in colour. This is owing to the fact that the ammonia brings about the actual combination of the citric acid and silver, together with nitrate of ammonia as a by-product; the effect is, in fact, tantamount to the substitution of citrate of ammonia for citric acid in sensitising.

If an excess of ammonia be added, the emulsion not only becomes very fluid, but also almost transparent, owing to the silver chloride and citrate being dissolved by the ammonia, a very small quantity of which is necessary. Such an emulsion, though it gives a thin and perfectly transparent film on glass, renders rich, vigorous, and nice-coloured images on paper, and, as already stated, possesses good keeping qualities.

The hygroscopic matter forms an item of minor interest, since it is possible to give the desired or requisite degree of moisture to any kind of printing paper by means of a few minutes' exposure to our moist atmosphere. If, however, it be decided to make provision for the necessary moisture, it is far the better plan to let it take the form of one of the alkaline nitrates, which, while performing the duty under discussion, also acts favourably on the colour and printing quality of the emulsion, and has a less tendency to discolour the paper than have the alkaline citrates, or glycerine, sugar, and similar additions that have been proposed.

I am far from recommending the "ideal" plan of concocting the emulsion for practical purposes, for a satisfactory printing emulsion is far more easily prepared with nitrate of silver and a soluble chloride and citrate in the ordinary way when the precise proportions are arrived at. But what I particularly desire to point out is the fact that free silver, in the form of nitrate, and excess of acid, especially citric, are entirely unneeded. If an acid must be used in the free state, I should substitute acetic or nitric for the generally employed citric.

CONVENTION JOTTINGS.—VII.

A Run through Some of the Scotch Studios.

JOHN STUART (Buchanan-street, Glasgow).

OUR next visit was to our old friend, Mr. John Stuart, 120, Buchanan-street, Glasgow. The beginning of his career in the field of the art-science dates back to the days when photographers were fewer, and the demand for pictures was greater, because the producers were limited. Collodion was then in the ascendant. And in those days really one had to earn his bread by the sweat of his brow, when compared with the easy manipulations of to-day; but most of the early enthusiasts and workers have died out—only here and there we come upon one who holds his own, and works on in the photography of to-day

with as much zest as they did in that of former times. Mr. Stuart is one of those, and he stands in the position of having within himself the accumulated experience of all the changes from that time right on till now.

In the most fashionable street of the city Mr. Stuart's place is situated, and his showrooms are furnished and adapted for a high-class *clientèle*. Large pictures, highly finished, on draped easels; panel pictures, fitted in Mora stands, from small panel up to the largest size; platinum work, from cabinet up to life size, and every variety of modern picture will be found amongst the showroom decorations. Prominent amongst a vast variety of excellent work are the flashlight pictures from 15 × 12 down to cabinet size. We have had occasion to note this class of picture before, it having been a speciality of Mr. Stuart's for some time. After inspecting a much larger variety of subjects on this visit, we can but repeat what we have formerly stated, that Mr. Stuart's flashlight pictures, taking them all round, are amongst the very best we have ever seen. The "at-home" pictures, where the families, grouped in their drawing or dining-rooms, are arranged and posed with telling effect, and the exposure, which is instantaneous, with *f*-12 stop, is quite fully exposed and well lighted, without any of the black shadows that are so often to be seen in flashlight productions. The silver prints in the 12 × 10 flashlight pictures are of a warm brown tone, with an enamel surface, which tends to impart to them a liquid fine effect. Many of those we inspected were finished in platinum, and certainly we consider them the most artistic finish; at the same time we have no hesitation in saying that the enamel prints will still be the more popular with the general public.

But Mr. Stuart was saying that platinum-finished work in large heads and busts has taken the place, to a great extent, of the oil-painted portraits that have been so many years in favour, and that a quieter style of finish is rapidly gaining ground.

In his business carbon opals are much more in demand than the bromide opal, and he encourages this, as he feels that the carbon is really the much more permanent of the two.

He has been working all makes of the gelatine chloride paper, and for a considerable time he favoured the pink-tinted in preference to white. The pink he found very good and uniform for some time after its introduction, but latterly he has found it rather uneven in colour.

Enlargements of machinery of all kinds is one of the special departments of this business. We saw when there enlargements of engines, locomotives and others, beautiful, untouched, six feet in length: they were really astonishing pictures for clearness, sharpness, and general evenness of lighting all over. The objective used for enlarging these 6 feet pictures was a Zeiss Anastigmat of 15-inches focus.

We also saw some very perfect groups taken with the same maker's lenses, which show a remarkable depth of focus, extreme sharpness, and absolute rendering of detail. Many will have seen the Convention group Mr. Stuart made at Edinburgh, which, with all the disadvantages he encountered when taking it, still shows prominently these qualities we observed in the general work. We referred to this excellent group in our "Editorial Table" three weeks ago, and gave our opinion of its merits.

In his studio Mr. Stuart has Seavey backgrounds twenty feet long, specially painted for large-group pictures. Cameras, from cabinet up to 24 inch, are constantly in use for direct work.

We saw an American camera here for outdoor work, which takes a thirty-inch plate, with a revolving back. We believe that Mr. Stuart was the first to introduce the revolving back camera into this country, for, long after he had it in use, the English makers—one or two of them—took out patents for it as quite original, and still they did not make it as perfect as the American pattern, it possessing the advantages of taking a picture at any angle, the whole back being fitted in, and excluding light; whilst, with the English makes, the moment the back was turned from the horizontal or perpendicular, the corners of camera showed right, so that it could not be worked at an angle, but only upright or oblong. He has also a portrait studio down at Helensburgh, and in suitable premises erected for the purpose all his printing and finishing is done there. It is a very complete establishment, where, from the making of the dry plate to the finishing of the picture, everything is efficiently carried out.

Messrs. Turnbull & Sons (Jamaica-street, Glasgow).

Since we last visited this place, Mr. Robert Turnbull has passed away, in the very prime of life and usefulness. He was one of those genial souls that it was a pleasure to know, and many of those who went to the first Conventions were familiar with his bright and cheery face, and ever-helpful nature, for he took a great interest in the Conventions from the very first. He was one of the victims to the influenza epidemic at the beginning of this year, and the news of his death came upon us with quite a shock, for, when we saw him a short time before, he looked hale and hearty, and good for another twenty years.

The businesses are now under the proprietorship and management of Mr. Charles Turnbull, who, previous to Robert's death, conducted the Belfast business.

Now they have studios in Glasgow, Belfast, and Greenock.

The Glasgow studio is a very imposing structure, forming, as it does, the west corner of Jamaica-street and Argyle-street, having a run of 50 feet of frontage to Jamaica-street and 40 feet to Argyle-street. It is situated over the shops in the street. They have three flats, with an ornamental clock-tower at the junction of the streets at the top, which gives the whole place a bold and attractive finish.

The entrance way is at 10, Jamaica-street and is exclusive—no other parties entering by it to their business premises. The passage is fitted with an appropriate show of cases that always commands a crowd of sightseers. The stairway is broad, and the walls all the way up are made light, and bright, and airy-looking by being fitted with white enamel tiles. It is rather an exceptionally fine entrance way for such a crowded part of the city, where space means so much money.

On entering this place from the door on the landing, the air of business being done all round takes possession of us.

Opposite the doorway on entering is a polished counter, to which a young lady attends, seeing all who enter, and looking to the filling of the visitors' wants.

If to see Mr. C. Turnbull, you are shown to his private room. If a sitter, you are shown into one of the showrooms, and if for finished work—pictures that are to be supplied—the party is ushered into the delivery-room, which is a department by itself; as Mr. Turnbull says, "You know we find it a great convenience, for, 'if there are any complaints,' it is at the time of delivery they are made." Now you can understand how much easier and better to receive complaints and smooth matters out in a private apartment like this, rather than in an open place, such as any of the showrooms, where sitters or others are about, and where any little unpleasantness is going on, are so apt to catch up wrong impressions.

In Mr. C. Turnbull's private room telephones are fitted all round the walls. He has communication with the printing establishment at Toll Cross; he has also wires connected with every room in the studio. By this means he can have communication with any of his hands without leaving his room. Mr. Turnbull finds this arrangement invaluable, not only as a saver of time, but also a considerable saving of labour; there is no continual running up and down stairs, as there used to be, and the promptitude with which orders can be given and dispatched is very marked.

There are three studios worked on these premises, and the dark room in connexion with these is a special feature of the establishment. They are large and specially ventilated with Boyle's ventilators. They are well lighted by a combination of ruby and cathedral-green glass. The cathedral green was adopted by them when it was so much talked and written about, and from that time till now it has given them every satisfaction.

Another improvement we noted in these dark rooms is a gutter fixed under one large water tap, from which other small taps are fitted—ten or twelve of them—and set at equal distances, the gutter with these fittings running along the whole length of the sink. There is a square block fitted under each of these small taps, on which the negative is placed to wash. By this means they can have twelve negatives washing in running water at one time, and all supplied from the large tap, which flows into the gutter, and thence into the lesser taps. It does the work well and saves a considerable quantity of water.

Another new thing to us was observable at the entrance to the

dark room. The door of the dark room itself is set in a little square chamber, with doors opening at each side and in front, so that, in going into the dark room, one enters by one of these outer doors and shuts it, being then perfectly in the dark; the dark-room door can then be opened with impunity, no matter what delicate operations are being performed inside, without the cautions and callings that are usually resorted to in such a case, this arrangement rendering the operations inside free from any chance of extraneous light.

Large groups and cabinet pictures are what Mr. Turnbull makes the leading lines in his business. All this class of work goes out with enamel surfaces. The enamelling department is well worth seeing, the system and speed with which the pictures are turned out being marvellous. The waxed collodion-coated plates, 12 by 10 in size, are made, and then fitted into racks to dry, ready for use; these racks are built from the floor to the ceiling, and we saw them filled with hundreds of plates. In ordinary weather the plates keep well for two days; but, if it is very warm, there is a tendency for the collodion to peel off.

Mr. John Moran, the general manager at Messrs. Turnbull & Sons, was the gentleman who introduced and carried through the weekly half-holiday for the Glasgow studio hands—a movement that resulted in a great benefit to the employees, and one for which he deserves the best thanks of the employed. One thing must be said, both for the firm and its manager, that at all times the hands receive the most liberal consideration from them, and with the result that a change of hands in the place is rare.

In all kinds of artificial lighting, from a photographic point of view, Messrs. Turnbull have been ever to the front. The luxograph, magnesium ribbon and powder, and lastly, electricity, each have filled their day with them, and they are ever amongst the first to introduce anything new in the photographic world.

OPTICAL GLASS.

[Photographic Club.]

A MORE exact title for the paper would have been "Glass for Optical Purposes," although that is not a sufficiently precise definition, as all glass which we apply in order to see through it is, in a sense, "optical." But I should have to use a pretty longish term to define exactly what is meant by glass for optical purposes, and we may proceed to the more concrete part of our subject without leaving any doubt in our minds as to what we are talking about.

Antiquity of Optical Glass.

We know for a fact that optical glass was in existence before the Christian era; I do not mean to say that it was equal to Chance's dense flint, but, being used "optically," it was optical glass—at least, in its application. Claudius Ptolemy, the Alexandrian astronomer, living about the second century B.C., wrote a treatise on optics, refraction and reflection, and on lenses and mirrors. Copies of his works are said to exist in the Bodleian Library at Oxford, and in the Royal Library at Paris. We are, therefore, not talking about a new thing, either as regards lenses or with regard to "optical glass." Other works of a similar kind exist, one of the best known being that of Roger Bacon, who, in the thirteenth century, wrote his *Opus Majus*. He has, in fact, been looked upon by many as the inventor of the microscope, and the telescope too. We are not told where his "optical glass" came from.

You are all familiar with the story of how Galileo came upon the form of telescope which bears his name, but he does not possess the laurels alone, for we have it recorded that telescopes were made in the year 1600 by a Dutchman named James Metius, at Alkmaar, in Holland.

During all this time optical glass must have been procurable from somewhere. It is, however, very evident that the make of what we *now* understand by optical glass must be a modern thing, for it is evident that before Newton showed the different refrangibility of different parts of light, there could have been little room for such an establishment as the one now in existence at Jena, where glass can be had to order with a given index of refraction calculated beforehand to the third and fourth decimal for any part of the spectrum.

What is Optical Glass?

Glass was made, we know, something like 1600 years before the Christian era in Egypt, and, as it was soon ground into lenses, it must have been "optical." When glass becomes so pure that we can speak of its refractive indices, and of its spreading or dispersing the light in regular or even measurable ratio, we look upon it as optical. The crown and flint glasses so called, are those we use for optical purposes. Crown glass is a plate glass, or *vice versâ;* flint is a glass charged with lead. That for optical glass the finest and purest of materials must be used goes without saying. White sand is used, pearl ashes, borax, cobalt, manganese, and other ingredients, and as a matter of fact, hardly any glass is made without the addition of some pieces of broken glass of the same kind. Flint glass is also made of fine white sand, red lead, fine pearl ashes, nitre, arsenic, and manganese. Many of the modern optical glasses contain other additional substances, which I shall refer to later on. Flint glass was formerly made from flint ground up; but I understand it is not used now.

In England, Chance Brothers, of Birmingham, have for years produced some fine specimens of optical glass—notably, their heavy flints; and in France, Feill, of Paris, has made glasses in many instances exactly of the same character. In Germany nothing was produced on any large scale since the death of the great Frauenhofer in 1826—who made his own glass—until lately, when, after some experiments, carried on during a number of years, the scientific world was taken by storm with a series of glasses such as we had never had before, opening up new means of improved construction for all sorts of optical instruments, notably also the ones that will interest you most—the photographic objective.

It is very evident that, as far as the manufacture of optical glass on a truly scientific basis is concerned, there was much left to be desired by the state of things up to 1885 or 1886, and there was no means of eliminating certain errors of a chromatism entirely even form the finest instruments of the most renowned makers.

Several attempts had been made, notably in England, to bring about a more satisfactory state of things, and after the work of Frauenhofer had been cut short an Englishman, Harcourt, made experiments between 1834 and 1860, in all about 160 different pots, but he had not the technical assistance necessary; and, apart from some attempts which seemed to point in the right direction, he wasted much time in making glass containing titanium. This glass, which he principally made with a view of eliminating the secondary spectrum, did not answer, but it showed the possibility of getting rid of this secondary spectrum once the right material was found and applied in the right way.

Abbé and Schott's Experiments.

Professor Abbé is said to have come to the conclusion that the then existing state of things with regard to optical glass specially for microscopes could only be remedied by the creation of entirely new materials, and he gained this conviction after a visit to the exhibition of scientific apparatus in London in 1876. He communicated with Dr. Schott, who then lived in Hanover, and the idea of creating a new establishment for the production of improved optical glasses was accepted by both.

The principal object was to produce such glasses that would allow the elimination of the so-called secondary spectrum from the objectives, especially from the microscope, the instrument which suffered more than any other from this defect. Experiments were begun in 1881 and conducted on a small scale until 1883. From that date experiments on a large scale were undertaken, and with the help of some 60,000 marks contributed by the Prussian Government from the fund set apart for scientific research, many new kinds of glass were experimentally produced which, in combination with others of the known or of new kinds, would allow of combinations in which the chromatic or spherical aberration could, to a greater degree, be corrected, and the secondary spectrum be almost eliminated.

This is accomplished by improved crown and flint glass mostly with mixtures of boracic or phosphoric acids, while greater variety in the refractive and dispersing powers of the glass, was obtained by applying baryta, magnesia, and zinc oxides. Thus, up to now, something like eighty different kinds of glass have been put on the market, and experiments have extended to more than 1000 kinds of glass or compositions of glass.

The materials that have finally been adopted are several series of new glass, as the phosphate crowns, barium phosphate crowns, boro-silicate crown, barium silicate crown, &c.; borate flint, boro-silicate flint, a special silicate flint, and a light baryta flint.

Advantages of the New Glasses.

The great advantage which the constructing optician has gained by the establishment of this furnace is, that he can obtain any of the glasses enumerated in the catalogue always alike, and with increased precision for the measurements of the refractive indices. Nay, more, he may require a glass slightly different in refraction at one or the other part of the spectrum, and he can obtain it; but the

variety is in itself so great that for almost any special purpose a glass will be found that will answer. Moreover, formerly, every batch of glass turned out had to be examined in the spectrometer, and its refractive indices ascertained, while now they are precisely given for every pot, as well as the amount of dispersion for the principal parts of the spectrum, and the specific weight. As most of you know, the usual mode of specifying glass is by giving the refractive indices of the sodium line D (double line), and of the three hydrogen lines, C, F, and G. The measurements at Jena are, however, also made on the line A, the potassium double line, so that their measurements are made on five lines of the spectrum, A, C, D, F, G.

Their catalogue indicates for every kind of glass—the refractive index for D, the brightest part of the spectrum, the mean dispersion from C to F, following which is given the proportional or relative dispersion. The glasses are enumerated in order of this last factor, which allows at a glance a comparison of the refractive and dispersing values of glasses intended to be combined.

I found, some years back, that in some heavy flints made by Chance these indices agreed exactly with some glass of the same kind made by Feill, of Paris, so closely as to show the same figures up to the third decimal. If you had asked any of these makers to make two pots of glass exactly alike to that degree they could not have done it, or, at least, could not have guaranteed it to come out absolutely the same. Hence a new batch of glass had to be studied spectrometrically before much else could be done with it, and much of that labour is saved to the constructing optician now by the precision in which the Jena people specify their productions.

Such a profusion of new material is a great boon to the constructing optician who has been hampered by the insufficiency of the material at hand formerly because of the impossibility to fully achromatise with flints and crown glasses, or even with two flints combined, because of the disproportionate dispersion of most, if not of all, the heavy flints, as compared with that of crowns or of light flints. Many of the new glasses combine much better, and the result is that lenses can be constructed giving much flatter fields with the same angular apertures and better achromatism into the bargain. When the combined glasses allow the achromatising in three different parts (colours) of the spectrum, the so-called secondary spectrum is said to be eliminated, and the correction is for most purposes complete. This is of great importance in microscopic lenses, but for photographic lenses it is of less consideration.

Identity of Jena and English Glasses.

We find that at Jena they now produce exactly the same glass as the former glass made by Chance Bros., as, for instance, their No. 8, which we learn to be a "calcium silicate crown." There is another, No. 12, also corresponding to Chance's "soft crown." It is a "barium silicate crown." Their No. 58 again corresponds to Chance's extra dense flint. They call it "heavy silicate flint." And, finally, No. 40, another heavy silicate flint, corresponding to Chance's double extra dense flint. You will see that all these flints have a high index of refraction for the D region of the spectrum, such as 1·7174 for the least and 1·65 for the former.

You will see, by a perusal of the Abbé-Schott catalogue, that for photographic purposes mostly the silicate crowns or flints are useful, and also some of the baryta flints, most of which are colourless, or nearly so, while the *borate flints* are not to be employed for photographic purposes, on account of their being affected by the atmosphere. They will, however, be valuable for the microscope, where they can be protected by another kind of glass forming the outer lens or lenses.

Some Properties of the Jena Glasses.

The glasses which have proved to be of great value to the photographic optician and photographic purposes generally, are the baryta light flints, on account of their proportional high refraction, that is, a refraction of a considerable angle. This permits of lenses being ground with much flatter curves, inner and outer, and the result is a much flatter field obtained at the focal plane. As an instance I can mention Suter's new rapid aplanat D, which is made of such glass, and was, in fact, one of the first lenses manufactured out of this material, the curves of which are much less deep than any lens previously made of such intensity, viz., *f*-5·5. No. 2 u.s.

Voigtländer had made a lens of nearly the same angular aperture previously, but I do not believe they were kept going for any length of time, and the series have disappeared from their catalogue or are replaced by lenses of a newer construction. Suter had, in fact, made a lens previously of the same aperture (*f*-5·5, No. 2 u.s.), of which there were issued some few; but they were dropped in favour of the new construction which the Jena glass permitted, and a great gain in even illumination, rapidity, and flatness of field was the result, besides much more complete correction of chromatic aberration. Dallmeyer had also once produced a lens said to have had almost double the aperture of a rapid rectilinear, but it was not, I understand, issued on the market. I am, of course, speaking of cemented double combinations, not of triplets or lenses with separated back glasses.

These attempts of opticians to construct lenses with greater apertures, and so few faces only, were frustrated simply on account of the want of a suitable material. Now that the material is at hand, no difficulty exists, and in the hands of our able opticians plenty of these instruments, of excellent quality, are produced. The usual objection which was made as to using the new material, the one that it did not keep, has now pretty well been silenced, and English opticians, after some hesitation, have begun to use the material freely, and will no doubt produce excellent instruments from it.

The values of the several series of new glasses have been ably brought to the practical test by the Zeiss anastigmats, which are now largely manufactured and for which licence has been granted to a number of leading opticians, such as Voigtländer, Suter, and, in England, to Ross & Co. These lenses accomplish successfully what was, with the material previously at hand, tried repeatedly, but not with good results, viz., a lens of the rapid type, that is, with an aperture of *f*-8 and larger, which at the same time can be used as a wide-angle lens, and which, with the full aperture, already embraces a covering angle of about 60°, as is the case in the Series III.

Manufacture of the Glass.

With regard to the manufacture of the glass, it would be a vain attempt to write a description without a good set of illustrations; but some idea may be gained of the nature of the operations when we are told for instance, that the making of silicate glass will take close upon three weeks. The pot, or crucible, in which the glass is to be "cooked" is, after being well dried, heated during four or five days until it attains a red heat; it is then put into the oven where, as soon as it has reached the temperature of melting glass, a few pieces of glass of the kind to be made are put into it, and as they melt the inside of it is well glazed out with the molten glass.

The crucible is now filled with the sand and chemical substances that are to make the pot of glass to be produced. When this is thoroughly melted and worked into a homogeneous mass the crucible is brought to a greater heat still, which is supposed to thoroughly digest the pot of glass and drive all the air out of it, this lasts six to eight hours. The glass is now tried after being thoroughly stirred with a rod, and found homogeneous and free from air bubbles and clear. It is then tried on the blow-pipe. If the pot proves to be in good condition it is taken out of the oven by a crane, it may weigh some fifteen to twenty cwt., or about a ton. It is then left to stand and "gently simmer" so as to cool down a little, is then brought into another oven, in which a second crucible has undergone the preliminary warming process, and which is intended for the next pot of glass of the same or a slightly different composition. In this oven the glass is left about three days to cool; the contents harden up—dry up—as the melters say, and on "drying," or hardening, break up into a number of fragments.

The crucible is now broken up and the contents cleaned of any impurities. The clear transparent pieces are next subjected to the "setting" process. By this they are heated to about melting point, having been laid into moulds, where they adopt the desired forms of discs or slabs as required. This is done in a special oven, to which a cooling oven is attached. The cooling takes ten to twelve days, and the pieces are finally taken out, and two edges or faces are cut, so that through the polished surfaces—which, as you see in the samples, are always opposite to one another—the glass can be examined. The net result of usable glass amounts to about twenty per cent. of the quantity melted in a pot, and that is considered a good percentage.

This is the ordinary procedure for the bulk of glass intended for ordinary purposes. For special glass, such as large telescope object-glasses, a special process of cooling is employed, of which I can give you no specific information: but a circular of the firm of Shott sets out some points of examining discs of sizes up to, say, fourteen inches, and for which they have adopted what they call fine annealing, which consists in storing the glass in a vessel, the temperature of which can be accurately measured, and which is made to cool down at a very slow and uniform rate, and can be regulated according to requirements.

Testing the Glass.

Most of you may be acquainted with the mode of testing such discs or lenses by use of the Nicol prism. It consists of placing a lens or disc of glass, or a plate, between two polarising prisms, rotating the one until the light is polarised, and then observing the more or less regular figure of a cross on the disc; the regularity of the cross proves the homogeneousness of the glass. An irregular cross will be proof of tension in some parts of the disc.

It now remains only to put before you some of the samples that I have here to show, most of all of which are suited for photographic objectives, and all of which, I am told, may be looked upon as unaffected by the atmospheric influences. Most of these glasses are almost free from colour, and you will see that a number of them are light flints, which now take the place, in a great degree, of the former heavy flints, by which alone the high index of refraction necessary for some instruments could be obtained. This is, as I have shown, a great gain.

J. R. Gorz.

HARMONISING HARSH NEGATIVES.*

In this process, as in all others, great cleanliness is required, and the plate must have been thoroughly freed from hypo before proceeding to rehalogenise. If hypo or other chemicals be present, thin patches and dark spots will show; if there are grease spots or finger marks on the plate, irregular action will take place. It is best to take but one trial print from the negative, and exercise great care in doing so if rehalogenisation be thought needful. When operating on old negatives, I swab them gently with dilute ammonia to get rid of possible grease spots before beginning the process.

I will now pass around some prints from negatives before and after rehalogenisation, calling your attention to variations in and additions to the process necessary to secure different effects. I have, with one or two exceptions, printed in platinotype, as being less suited to harsh negatives than print out silver paper, and, in order to show what the process is capable of, most of the prints are from what would be considered hopelessly harsh negatives previous to treatment. I need scarcely say that I would not recommend that time should be spent, except for practice, upon any but negatives that are likely to give good results.

The prints marked A are from a portrait negative taken under very unfavourable circumstances. In the first print the deepest shadows are reversed, and the letterpress on the book is barely visible. The second print is from the negative after rehalogenisation. You will note that detail is visible in the darkest shadows, and that the light half-tone is just as discernible, the whole print being fairly soft. The third was printed after the book, and hands had been locally reduced. A little more detail is visible in them, but the reduction has not been evenly performed.

B is another portrait. You will see how dark it has been necessary to print the shadows before the detail in the face was strong enough. The second print is rather too dark, but you will note the absence of the aggressive brilliancy noticeable in the first.

C is from the negative of a waterfall lent to me by a member of our Society. In the first print the rocks are a mass of black, with one or two white leaves showing; the water is a mass of white broken only by a few dark streaks of shadow. The print, after rehalogenisation is, I think, quite a passable picture. It was, of course, impossible to obtain detail in the seething water, as the exposure given had been too long to secure that.

D and E are attempts to obtain passable prints from much-under-exposed negatives. Both seemed to be void of detail in the shadows, the only deposit of silver seemed to be in the sky, and its reflections through the trees from the water. The other portions of the negatives were badly fogged in forcing the development. D was cleared with hypo and ferricyanide, rehalogenised to soften extreme contrast sufficiently to permit of intensification intensified with pyro and silver, and badly obtained in the process. In attempting to clear this away the film frilled, and farther manipulation was impossible. A slight improvement is noticeable in the second print. The surface fog was cleared away from E with bichromate and sulphuric acid before the first print was taken. It was then rehalogenised, the sky being reduced to a mere yellow stain. When laid on a sheet of white paper, faint signs of detail were discernible in other parts of the plate. It was then five times intensified with mercury, followed by ferrous oxalate (Mr. Chapman Jones's method). The traces of halation round the tree tops visible in the first print, though apparently removed by rehalogenisation, were strengthened by intensification, but the shadow detail was much improved.

If the subject were worth the trouble, I believe it would be possible to remove the halation and slight traces of fog still remaining, and to obtain a soft clear print showing sufficient detail in the shadows.

F is a print of a pine-tree avenue from a negative lent to me. The topmost branches are invisible from halation, and the foliage in places has the appearance of being powdered with snow. The negative was rehalogenised, and I think you will admit that the second print shows these faults entirely removed.

G is a portrait group by one of our members. He performed the process of rehalogenisation from the formula I gave him. Although the first print is a warm-toned gelatino-chloride-of-silver one, which favours the harsh negative, I think the second print is platinotype shows the negative to have been much improved.

H is from a negative lent to me. It is a drawing-room seen through folding doors, taken to test a wide-angle lens. The lace curtains over the window opposite the lens are badly halated. I hoped that after rehalogenisation some detail would have been seen in the halated parts. Unfortunately the plate was poor in silver, and unable to register the extreme contrasts of light and shade. In the second print the window is a path of light grey, void of detail, although the other parts of the print are much improved. I thought I saw slight signs of detail in the window part of the negative, and carefully reduced it with bichromate and sulphuric acid in the hope of accentuating the shadows there, but the third print shows no improvement in that respect.

I is a view on the Brent, an attempt to show what might be done with a fairly good negative. The first print shows a blank sky. The landscape is, perhaps, a trifle wanting in brilliancy. As there were clouds showing in the negative, it was rehalogenised. In the second print the sky and clouds print out, but the whole print is poor and flat, the result of too compressed a scale. The negative was then intensified with pyro and silver, and the third print shows sufficient brilliancy more certainly than the first, and yet the sky, with its fleecy clouds, prints out. This is an instance of two scales being introduced into the composition, each of them being compressed slightly in the shadows, and the light half-tone rendered a little more fully.

In order to judge of what the process is capable of doing, it may be well to consider the action that takes place. If we were to strip the gelatine film forming the negative from the glass support, and reverse it so as to have what was originally the back of the plate outwards, and were able to remove the gelatine, leaving the silver image intact, we would find that image in the form of a low relief, the shadows being extremely thin and the high lights the thickness of the film. If now it were possible to take a shaving off the top of the image, removing only a portion of the lights and light half-tone, that light half-tone would be reduced in density, but would print as a flat grey tone without gradation. This is approximately what takes place when the development after rehalogenisation is stopped before the high lights are developed right through to the plate.

Fortunately, the simile does not hold good to the full extent. The developer in soaking downward does not act in rigid planes; before the shadow detail is fully developed the action has proceeded a little farther in the half-tone, and by the time the half-tone is thoroughly developed the highest lights are beginning to show traces of action at their points of greatest density. The result is that, if the development be then stopped in fixation, a thin film of silver is removed from the back of the negative thickest from the high lights, thinner from the half-tone, and not at all from the shadow detail. Some gradation of tone is therefore preserved in the light half-tone, but it must be borne in mind that this will not show the brilliancy it had in the original state of the negative. I believe that the composition of the developer will modify the action to a slight extent. By using a little bromide or reducing the quantity of ammonia the action will be retarded, and the developer will act more evenly through the thickness of the film. This is the method to be employed when the contrasts are great and the shadow detail fairly strong. When the negative is thin but still strong in contrast, the opposite method should be followed. The developer should act speedily, or, by the time the shadow detail is thoroughly developed, the high lights will also have been developed so far, that little or no improvement will have been effected.

You will see that, in asking you to give this process a trial, I do not recommend it as a panacea for all the ills that photographic negatives are heir to, nor do I suggest that, in all cases where it may prove useful, it will effect the whole of the cure. It must be used with judgment, and in many cases must be proceeded or followed by other treatment. I recommend it as probably the best way of lowering the light in a broad and even manner without affecting the shadows, thus introducing a second scale of light and shade into the negative.

Should the negative be too flat after treatment, it may be intensified either generally or locally to give the desired brilliancy. Or, if the negative, though flat, be still fairly dense all over, it may be rendered generally or locally.

The effect of intensification and reduction will be very different, though an unobservant eye might not distinguish between them, but the worker who desires to achieve certain results will discriminate in their use.

Intensification affects the shadows but slightly, the half-tone and lights being greatly strengthened, the result being analogous to the artist's method of rendering the lights in an approximation to the natural scale and compressing the shadows.

* Concluded from page 554.

Reduction will affect the lights to a trifling extent, while greatly altering the shadows. In the print the shadows will approach more nearly to nature, and the lights will remain flat.

The art side of the question forms no part of my subject. The application of these methods to our work in accordance with the canons of art will, I hope, be treated by a member of our Society, more capable than myself at no distant date.

I may, however, to illustrate my point, call your attention to a collodion negative (which has been lent to me) made from a steel-plate engraving. If we disregard the fact that it is composed of lines, and consider only the relative values of the light and shade, we will be struck, first, with the shortness of the register, the general flatness, if I may use the term; and, secondly, by the brilliancy of the local contrasts.

Were we to expose a thickly coated isochromatic plate upon such a scene, using a yellow screen, we would find upon development that, while the landscape portion of the negative would resemble to some extent the negative before you, the sky and its reflections in the water would, while showing strong local contrasts, be so opaque that it would be impossible to print them out; yet by rehalogenisation, followed by partial or general intensification or reduction, or by a judicious use of both, something approaching the desired result might be obtained.

As evidence of this, I will ask you to examine the negative from which the prints marked I were taken.

Without presuming to compare that negative to the collodion negative, either in artistic composition or technical excellence, yet I think that the relative values of the masses of light and shade and the local contrasts will be found to be somewhat similar.

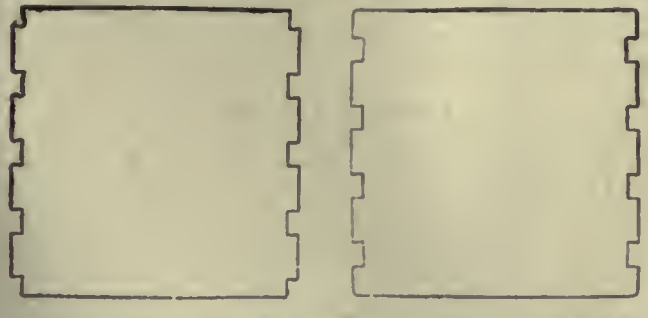
In conclusion, I desire to express my opinion that our best negatives from a technical point of view are those which most require, and will best repay, the time spent in trying by the various means in our power to make the tones and relative values of lights and shadows more nearly approach the results obtained by the draughtsman and the painter.

J. McIntosh.

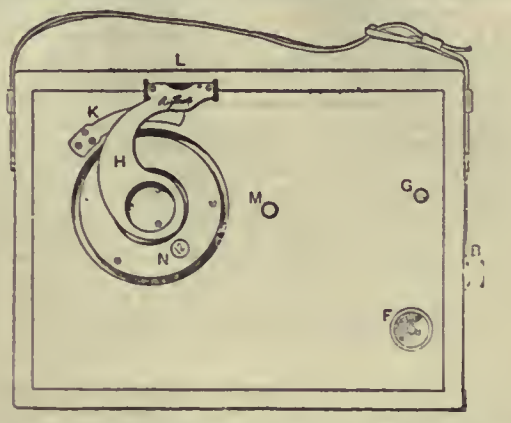
THE FRENA HAND CAMERA.

Since we noticed a few months ago the introduction of the film-carrying Frena Camera, Messrs. Beck have perfected certain improvements by which the efficiency of the instrument is still further increased. As supplementary to the notice in question, in which we showed a drawing of the exterior of the Frena, we are now enabled to give some details of its working and construction, more especially as we have had an opportunity of witnessing its manipulation in the hands of Mr. Conrad Beck, who is an expert in its use. By the reciprocating action of the lever on its side, Mr. Beck, in a singular brief period, transferred the forty films with which the Frena was charged from the vertical position in which they are exposed to the horizontal position in which, after exposure, they remain in the bottom of the camera ready for removal.

The films are notched on two edges, as shown in the subjoined cut,



and interposed between each film is an opaque card, also notched. This is also shown by a cut. But it will be observed that the notches are so arranged as to be antagonistic, those in the film corresponding with the projections in the card. Four pins project on each side at the focal plane, and on these rests the first film of the pack. By grasping the lever H on the side, and rotating it a certain length to a projecting check at M, the following actions take place:—The four pins on the focal plane at each side are moved aside opposite the notches in the film, which immediately drops, and on returning the lever to its former position, as in the cut, and in which it is retained by the spring K, the opaque card is also liberated and drops, leaving the second film of the series ready for exposure; and this goes on until the supply has all been exposed, which is shown by a registering index at N. A spirit level, L, on the top of the lever, shows when the frena is held accurately. But, as this lever influences the position of the film, the latter may be inclined in either direction, and it thus fulfils the condition of a swing-back. The



shutter is set by the milled-headed screw B on the front, and the exposure is made by pressing a button at F. A draw-bolt, G, has reference to the regulating of the duration of the exposure.

We have received an advance copy of the *Frena Handbook*, containing, in course of 160 pages and fourteen sections, full directions for working the camera, and many useful hints in photographic practice connected therewith.

The films are of a thickness sufficient to ensure their remaining quite flat when being exposed, and, the edges being notched by machinery, they are all necessarily identical in this respect.

ON THE SELECTION OF VIEWS.

II.

Most people, when examining a landscape picture, involuntarily desire to ascertain what exists beyond the foreground, scanning every little bit of distance or suggestion of it to satisfy themselves. The more suggestive a picture is, the greater interest it has for most people. The quality of attractiveness depends but little on the size of the picture, but is almost wholly dependent on the manner in which the subject is treated. Some of the most charming and artistic photographs produced have been small in size. It not unfrequently happens that a subject may show to better advantage in one size than another, or one shape than another. If a subject is intended for enlargement by the optical lantern or otherwise, it should be judged rather of itself than on the focussing screen, as the reduction in size is sometimes apt to mislead. One important point in landscape work is not to have it too crowded, and another to have the lights and shadows well massed. A number of lights distributed pretty equally over a picture causes a spotty effect, which always interferes with its pictorial value, by distracting the eye and inducing an unrestfulness that is apt to be fatiguing. The study of Mr. H. P. Robinson's writings on picture-making cannot fail to be of assistance to the beginner, showing him the why and the wherefore of certain forms of composition. In selecting the view, objects should be so arranged that the linear and aerial perspective assist each other, carrying the eye continuously from foreground to distance. One or two special points of interest are preferable to a great number, and the lines of the subject should be so arranged as to lead up to these special points. The beginner may ask, How are they to lead up to it? The reply is, by studying the forms of the objects and the disposition of the light and shade, so that the eye ranges from one to another, finally resting on the point it is desired to make of importance. For instance, suppose a pathway over fields, hidden here and there by undulations in the ground, trees, or what-not, with a cottage in the distance, or perhaps nothing more than a chimney-stack above the trees, the eye involuntarily follows the track to the distant object, which at once becomes the point of interest, and the hidden portions of the path are imagined; but that is quite sufficient to supply the mind with the idea of its continuity, aided by the disposition of lines of hedges, fencing, or whatever it may be, towards the same point. So it may be said of the windings of a river, appearing and disappearing amongst the trees and banks. We see it at hand, maybe a rushing, impetuous torrent, to be traced as a broken silver line in the hazy distance, till it finally disappears. The linear and aerial perspective assist each other in giving a true impression of space.

In the examination of a view as to its suitability for photography, I find it a good plan to nearly close the eyes until no object is particularly distinct, which permits a better judgment being exercised as to the value of the light and shade alone, irrespective of detail. One may also more easily estimate the effect of the proportion of foreground to distance and middle distance in this manner. The Thames side in summer time; it is an animated pretty scene, but, unless particular care is taken to secure a proper foreground, the river's opposite banks and landscape beyond will be little more than unimportant-looking strips in the photograph. In such a view we must get some fairly large object near the foreground; a boat with sails set is one of the best, or a well-arranged group on the bank fairly near the camera, with the water for a background, is also satisfactory. Trees, in this case, are only available now and then, unless from a bend in the pathway, as lenses of only very moderate angle are suitable. In almost all cases where the landscape forms parallel strips, the camera should be so adjusted that some object partially hides or breaks them up. In nature colour will, in most cases, prevent the monotony of form being particularly noticeable; but when, as in the photograph, this is done away with, the arrangement becomes unpleasant.

The greatest number of landscapes are better for having some large or important mass of material on one side or other of the foreground, and the general form more or less repeated in the middle distance. With respect to the introduction of figures, the view, in the first place, should be selected and examined on the focussing screen. It will then be seen where figures will help out the composition, it is a mistake to merely put in a figure for the sake of a figure unless it improve the picture; in fact, many photographs would be considerably improved if the figures were left out altogether; at the same time, there is no denying that a suitable figure, or group, well placed, is a great addition to almost any landscape. However, they must not be placed too near, or in too great a number, or the landscape becomes a figure subject, with a landscape background, which parts with most of its interest in consequence. In searching for subjects, valleys are more prolific in suitable bits than higher ground; the side of a stream is frequently the best part of a district. It is always a good plan to look about in near proximity to water, for often, when other parts have been drawn blank, the water side will provide pictures.

Water itself is eminently suited for photography, either for itself or as an accessory. It possesses the inestimable quality of variety; the glassy pool, the foaming torrent, or the breaking wave have all their lovers. In this connexion it may be remarked that a perfectly still surface, reflecting everything like a mirror, is never satisfactory in any but stereoscopic work, where we get apparent solidity and depth; it is therefore advisable to disturb the water just prior to making an exposure. A very slight movement will break up the reflections, and that is all that is required.

Bridges, ruins, green lanes, and marshy districts will, in a flat country, usually supply plenty of subject. With respect to flat, marshy districts, good cloud effects may frequently have conjunction with them; the marshy ground, with irregular patches of water, lends itself exceedingly well to cloud effect, as well, or better, than the seaside. In photographing ruined buildings or other architectural subjects, one of the most important matters is to choose a proper time of day, so that the shadows are as effective as possible. With the sun shining directly behind the camera no good results need be expected; the image may look fairly well on the focussing screen, and the negative be technically perfect, but in the finished picture the improper lighting will be glaringly manifest, and such that no dodging in the printing or in the negative will remedy. All architectural subjects depend very much on proper lighting for effect, as much so as portraits; neglect, consequently, in this particular results in unsatisfactory work. Hilly and mountainous places, as Wales, Devonshire, and some of the midlands, are probably as prolific in suitable bits as most counties; the difficulty is not where to choose, but what to choose. The best plan is to thoroughly prospect the place, making notes of any particular view, and seeing it at different times of the day, so that the best light may be selected, or some accessory or other introduced that is not always present, if it will help the effect. For instance, a lane scene beautiful in itself might be vastly improved if a rustic cart and horse, or something of the kind that would harmonise with the scene, could be introduced. It is generally possible to manage matters of this sort without much trouble, but generally necessitates a previous acquaintance with the spot, so that you may know exactly what you require, for it is rather tedious waiting for that particular something to turn up in out-of-the-way places, like scores in Devonshire and Wales. The more unfrequented, the better it is for photography; and this applies to places other than Devon and Wales. Age, neglect, and decay, rough, home-made contrivances, such as are frequently found in outlying rural districts, are the things that have charms for the picture-maker, if not for others.

Boats and shipping are always picturesque, and on that account will continue to be favourites with photographers. Vessels left on the beach by the receding tide and discharging their cargo often supply very good subjects. Anchors and rusty chains are useful in the foreground. There are few pictures more attractive than a good maritime or river subject well treated. There are few places in this country where pictures cannot be had, providing they are sought for by *trained* eyesight; and my advice to all photographers is to look well about their own neighbourhoods, if they have not already done so, and they will probably be surprised at the number of pictures they will discover hitherto passed by unnoticed. EDWARD DUNMORE.

Our Editorial Table.

LANTERN OBJECTIVES.

BY JAS. SWIFT & SON.

IN anticipation of the lantern season, now close upon us, Messrs. Swift & Son, Tottenham Court-road, have introduced a series of objectives, all alike in principle, but of different focal powers, those submitted to us being respectively of four, five and six inches equivalent focus, although the series extends to ten inches, each in succession being one inch longer than the other. They have a large angular aperture, and hence project a slide under circumstauces of great illumination, which is aided by the fact of their being constructed of colourless Jena glass. One of five inches equivalent focus, which we critically examined, has an aperture of *f*·2·85.

Lantern objectives, especially those of foreign make, have often very long tubes, doubtless with a view to covering sharply, which they do not usually do; but in those before us the tubes or mounts are comparatively short, one result of this being that there is great equality in the illumination of the disc, owing to the large volume of light that that is transmitted obliquely.

Finding, upon trial with a test slide made from an engraving that the field was flat, we set about discovering the means employed for effecting this with a mount which, as stated, was somewhat short. We found, what we have elsewhere described as an essential condition, that there was an excess of negative spherical aberration in the back combination, which balanced the positive aberration of the front combination, one of great power in proportion to its diameter. It may here be stated that the diameter of the back combination exceeds that of the front.

In the mounting we observe that the teeth in the focussing rack are cut obliquely to its length, a feature now present in many of our best microscopes. This ensures smooth working by the pinion, and prevents "back-lash," or what microscopists term "loss of time" when focussing. Lanternists will readily grasp the fact that with the shorter of the objectives under notice, that of four inches equivalent focus, a large disc is obtained when there is no great distance between the lantern and the screen. This often proves of great advantage, especially in parlour entertainments or otherwise confined positions.

CONVENTION PICTURES.

MR. A. WERNER (Werner & Son, Dublin), who had left for the nonce the studio portrait camera, in the use of which he is such a proficient, in favour of the landscape camera, proves that he is quite as much at home in the use of the one as of the other by sending some charming pictorial mementoes of his activity during the outings now so pleasantly associated with the Convention in Edinburgh.

The views received embrace scenes in St. Andrews, Almond Dell, Cramond, and on the banks of Loch Katrine. They are printed in platinum, and are prized as reminiscences of a good time during a happy week.

STUDIES. BY F. M. SUTCLIFFE.

G. W. Wilson & Co., Aberdeen.

MANY of the admirable studies by Mr. F. M. Sutcliffe, with which exhibition visitors have in late years become familiar, are now being reproduced and issued by Messrs. G. W. Wilson & Co., the prints being made by the carbon process. The firm has recently submitted two specimen prints of the series to us (the subject of one being the widely known "Water Rats") which, alike as examples of the process and of Mr. Sutcliffe's art, are technically and artistically admirable.

RECENT PATENTS.

APPLICATION FOR PATENT.

No. 15,737.—"Photographic Vignetting Frame for Vignetting Albumenised Prints in Direct Sunlight, or for Vignetting Bromide Prints by Artificial Light." A. Dawkins.—*Dated September 2, 1892.*

SPECIFICATIONS PUBLISHED.

Amended Specification.

1891.

No. 16,094.*—"Photographic Pictures." Mathieu

Reprints (with alterations).

1891.

No. 3942.—"Photographic Apparatus." Naylor.

No. 15,615.—"Photographic Apparatus." Communicated by Moore. Thompson.

PATENTS COMPLETED.

A Simplified Form of Magnesium Lamp.

No. 17,586. Percy Ellis, The Manor House, Wallington, Surrey. *August 13, 1892.*

My invention relates to a simple construction of a lamp for burning magnesium ribbon or wire, or other similar material, whereby the ribbon may be kept burning by being pushed forward by the thumb and first finger of the hand holding the lamp, entirely without the use of rollers or mechanism.

It consists of a small spirit or other suitable lamp resting on a stand, so that the flame will ignite the ribbon as it is pushed through a small hole or slit in the reflector behind the lamp. The reflector is held secure in position behind the lamp, and a handle is fixed to the whole, at a suitable angle to the reflector, and of such a shape that it can be easily grasped with one hand, three fingers below, and the thumb and first finger above, the handle.

The ribbon which is to be burnt is held between the thumb and first finger, and from thence passes under an indiarubber band through the slit in the reflector, and then into the flame of the lamp, the supply of ribbon being kept up by shifting the wire forwards with the thumb and first finger.

The claim is:—A lamp for burning magnesium or other suitable ribbon or wire, having a handle as described, whereby the flame can be kept fed by the action of the thumb and first finger pushing forward the ribbon in the manner described.

[We are interested in knowing whether, if one pushes the magnesium ribbon through the flame of the spirit lamp by "finger and thumb" instead of by the clockwork employed in the Solomon & Grant lamp, otherwise similar to the above, will Mr. Ellis consider it an infringement of his patent?—Ed.]

Improved Means for Obtaining Photographic Portraits.

No. 17,967. George Bagnall Bradshaw, Beech House, 45, Oxford-road, Altrincham, Cheshire.—*August 13, 1892.*

Take an ordinary piece of statuary and place it on any convenient stand before a black or coloured background, and vignette the head from the body, leaving as much neck as possible. I vignette off the head from the body in the following manner by using an ordinary vignetting screen before the lens or in the camera, by preference in the camera if the background is a black one, and between the lens and the object to be vignetted if the background is white or coloured.

Any photographic process can be used for procuring a negative of the image. By preference I use ordinary photographic dry plates, and take the impression in the usual manner. I make a series of negatives from statuary, both busts, three-quarter and full length, in any position I may think advisable. Should my sitter wish a photograph of their head placed on either bust, three-quarter or full-length statuary, I place my sitter before a black or same tinted background as the statuary was photographed against, and take a photographic impression of the head, vignetting away the bodies by using an ordinary vignetting screen either in the camera or between the lens and sitter as before stated. I take the impression on any sensitive photographic film. I use celluloid films, and vignette the head from the body just a little below the chin, so that it will register on the neck of the statuary negative, which can be done by placing the negative of statuary selected on the focussing screen of the camera, and so adjusting the camera that the neck of sitter and that of the statuary negative shall be exactly the same size, or sketches can be made from the statuary negatives on any convenient transparent substance, and used instead of the negatives for the purpose of getting the neck of sitter in register. When I have obtained my photographic impression of the head I wish to place on statuary, I take the transparent film, and after adjusting it on the statuary negative, and retouching out all imperfections, proceed to print, through both negatives, by any of the ordinary photographic printing processes. I also mask or cover the face of any image, or life subject, or painting, or drawing, so as this part will appear almost bare glass on the negative, which I make in the usual manner; I then photograph the face I wish to place on the aforesaid negative by placing my sitter behind an opaque background, by preference black velvet, in which there is cut an opening just sufficiently large to show as much of the face as I require; I take the impression on any transparent film, registering the head in the manner previously stated; I place this film on the negative, adjusting the face over the part that is almost bare glass, and after retouching out all imperfections, proceed to print, through both negatives, in the usual manner.

I also make negatives of ladies, gentlemen, and children, in any position I may think advisable, and place other heads on their bodies by aforesaid process.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—1. That this is the only true method of placing the head of one subject upon the body of another, and printing from same without showing any join. 2. And of placing any face on any photograph of picture, statuary, or life subject, and of making same, when printed, appear as if the photograph was a direct picture and not a combination. 3. And that by this process ladies and gentlemen can be saved the trouble of dressing for their pictures, as all we will require will be a photograph of their heads and necks, and sitters can select the position or dress they would like to appear in on the finished picture from our stock of negatives or prints.

[But how about the "statuary" photographs of this nature that were common several years ago? Will Mr. Bradshaw kindly point out in what respect his method differs from that formerly employed?—Ed.]

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
September 12 ...	Darlington	Trevelyan Hotel, Darlington.
,, 12 ...	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 12 ...	North Middlesex	Jubilee Hall, Hornsey-road, N.
,, 13 ...	Derby	Smith's Restaurant, Victoria-st.
,, 13 ...	Manchester Amateur	Lecture Hall, Athenæum.
,, 13 ...	Stockton	Masonic Court, High-street.
,, 14 ...	Leicester and Leicestershire	Mayor's Parlour, Old Town Hall.
,, 14 ...	Munster	School of Art, Nelson-place, Cork.
,, 14 ...	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 14 ...	Reading	
,, 14 ...	Stockport	Mechanics' Institute, Stockport.
,, 15 ...	Brixton and Clapham	Gresham Hall, Brixton.
,, 15 ...	Greenock	Museum Com. Room, Kelly-street.
,, 15 ...	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 15 ...	Oldham	The Lyceum, Union-st., Oldham.
,, 16 ...	Cardiff	
,, 16 ...	Holborn	
,, 16 ...	Leamington	Trinity Church Room, Morton-st.
,, 16 ...	Maidstone	"The Palace," Maidstone.
,, 16 ...	Richmond	Greyhound Hotel, Richmond.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

September 1.—Mr. P. Everitt in the chair.

Mr. S. Ashby was elected a member.

Amidol.

Mr. A. Cowan in reference to amidol confirmed Mr. J. A. Sinclair's experience with it in having developed twelve negatives in the same solution. He (Mr. Cowan) considered amidol a very good developer indeed. His twelve negatives each occupied the same time in development and were of equal density. The two ounces of developer which he had brought with him were quite clear. He had tried it with paper, and it did not stain.

Questions.

The following question from the box was read:—"The edition of *Photography* to-day (September 1) threatens retaliation, with compound interest, upon the London and Provincial Photographic Association for having been the means of correcting some of the misleading directions published in that journal. Ought the Society to take any action in the matter?"

The Chairman asked whether it was worth while to take any notice of the matter?

It was understood that the question would be brought before the members at a future meeting.

Question No. 2: "Why must absolute and not methylated alcohol be used to dissolve cyanine for preparing the bath when orthochromatising?"

Mr. R. Beckett said the Britannia Works Company had recommended absolute alcohol. He had got cyanine to dissolve in the ordinary methylated alcohol.

Mr. T. Bolas said there would be no harm in the employment of the ordinary methylated spirit if "finish" were not present.

Question No. 3: "Is there a process for copying tracings which gives a green positive image upon a light green ground?"

Mr. G. W. Atkins said a good many copies of tracings passed through his hands which were evidently of a photographic character, and wished to know how they were produced.

Mr. Bolas said that green positives could be produced by the primuline process, which was described in The British Journal of Photography (see page 657 of the volume for 1890).

The meeting concluded after deciding upon competitions for copying and enlarging.

Hackney Photographic Society.—August 30, 1892, Mr. R. Beckett presiding.—Questions:—Does the carbonate of soda reduce the P.O.P. in fixing more than sulpho-cyanide? Reply: slightly.—How long will sulphate of iron keep? Reply: Almost indefinitely if bottle be full and well stoppered, and acidified with sulphuric acid. When the solution is clear and green it is *ferrous*, and aids the image-making, but when brown it is hydrated oxide of iron or *ferric*

and destroys the image. Discussion on the best mountant for the P.O.P. when polished was then continued. Mr. Reynolds advised gelatine, *quite* boil it, then allow to get nearly cold, though liquid, and use. If it be applied hot it will skin over. Mr. Harversen uses "aristotype paste" with good result. It was suggested that thin cartridge was as effective in keeping on the gloss as the ordinary waterproof blacking. Mr. Hudson showed a magazine containing twenty-four plates—one shutter. Place in changing bag, and take out plate from one side and put away in other. Members' work shown from Messrs. Dean, Gosling, Parfitt, Pollard, and Sodeau. A Daguerreotype was shown; method of producing it explained by the Chairman. Mr. SODEAU then gave a paper on *Dark-room Illumination*. Explaining the theory of light and dispersion, showed the use of the spectrescope. In its absence an efficient test is by using a piece of blue glass. If white light seen through these combined is affected by other tints, it shows the colour to be more or less faulty. Exposures of ½, 1, 2, and 5 minutes were uniformly made under the same conditions, viz., light about 1 candle power at 1 foot. Developer same. (*a*) Argand gas lamp, red chimney—result, transmits red orange, little yellow. Plate (1) Paget's 50, 1 minute. Image just visible. (2) Edwards' isochromatic medium, ½ minute, visible. More fog with isochromatic at ½ minute than Paget's 50 at 5 minutes. (*b*) Red glass, transmits red orange, and just a trace of yellow. (1) Paget's 50, 5 minutes. No effect. (2) Edwards' isochromatic medium, 1 minute, just visible—same as red chimney on Paget's. Altered burner to a Bray's, Paget's just showed at 1 minute. (*c*) Aurine (30 grains to 1 ounce of collodion), original burner, transmits red orange and a fair amount of yellow. Paget's 50, just visible in ½ minute. More fog than red chimney, but is counterbalanced by being more comfortable to work with, and can see with much less light than red.

Putney Photographic Society.—By the courtesy of the Director, members of this Society visited the Royal Gardens at Kew on Saturday last, and photographed in the various houses which are only open for the purpose until twelve o'clock, when the general public are admitted. After twelve the time was spent in photographing out of doors, and, as these beautiful gardens abound with objects of scientific and artistic interest, time went only too rapidly. The weather was favourable for photography, being generally fine, with a good diffused light, giving plenty of time for the shadows without destroying the high lights. While we were busy in the houses the weather was dull, with occasional showers of rain. This, in conjunction with the use of isochromatic plates, no doubt accounts for the entire absence of halation from the negatives. In the houses a wide-angle lens, say, of focal length less than or equal to length of plate, will be found very useful. The houses lend themselves particularly to effective stereoscopic photography, of which advantage was duly taken by one of the members. As a hint to intending visitors, it may be mentioned that, working with *f*-20 and Edwards' instantaneous isochromatic plates, an exposure of twenty seconds was found to be about correct in the houses, the resulting negatives being full of detail in lights and shadows and with fine gradation. Round the lower lake plenty of good views may be found, including snap-shots at the water-fowl of various kinds. These are readily brought into position by the judicious distribution of crumbs of bread; the wise photographer will provide himself accordingly.

South Manchester Photographic Society.—August 29, Mr. J. Wilkinson in the chair.—Several of the members, in response to the request on the circular, had brought exhibits of holiday work, consisting of negatives, prints, &c. Mr. Reid showed several lantern slides taken from negatives exposed in a Miller's hand camera. The Chairman brought two Sandell plates, one exposed for two seconds, the other twenty seconds with *f*-16, and developed with pyro, bromide, and ammonia. In the discussion that followed it was the opinion of the meeting that the longer-exposed one was the best, although very slight difference could be perceived between the two.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

PHOTOGRAPHY BY RULE.

To the EDITOR.

SIR,—I much regret if anything in my letter published in last week's JOURNAL betrays a style of controversy in any way unworthy of me, as Mr. Bedding opines; nothing is further from my intention than to say that which may reasonably offend or misrepresent. To set the example of forbearance, I admit that it is natural to suspect that commercial bias enters into my estimate of the paper I have criticised. I hope and believe, however, that such is not the case.

Mr. Bedding is content, he says, to waive his belief in the value of trial and error, as applied to exposure, if I will place the contrary beliefs in the scale against the work done by the vast majority of professionals and amateurs who do not employ aids to exposure.

If I attempt to meet Mr. Bedding on these lines, my reply must be that it is impossible accurately to gauge the work of this vast majority, as I am not ubiquitous, nor will they show me their failures. On the other hand, his paper would disappear bodily.

Whenever an attempt is made to raise a science from the qualitative stage to the quantitative, the same objection may be made; and, when in photography somebody initiates the quantitative element, it is injudicious to say that this has not been needed hitherto, and to decry the attempt.

I have not overlooked the reference to shutters, nor am I unaware of the existence of one-solution developers. I confined my attention to the "apparently inexhaustible supply of inventive genius," having for sole object the reduction of exposure and development to pure rule and system. These epithets are not, as far as I can see, applicable to shutters and one-solution developers; nay, according to Mr. Bedding, it is "mechanical aids to exposure" (*i.e.*, time and instantaneous shutters) which have called forth this "inexhaustible supply" of genius which he considers misplaced. Again, *vide* Jabez Hughes and Hardwich, one-solution developers were more numerous in olden times than they are now, so they are barred out from the category to which I have alluded; they are merely proposed as alternative methods of development.

I am asked if I maintain that no sources of error exist in the instruments of which I have spoken favourably. I reply, they are correct in principle as far as they go, and Mr. Bedding's "impeachment of the constancy of the factors taken into account in the systems" is no examination of the principles of these instruments. The principles of the instruments assume the *variability* of the factors with which they deal, not the constancy of them. An attempt is made, from a tolerably accurate knowledge of the present value of these factors, to deduce a proximately correct exposure, *and this they succeed in doing*. Further considerations with which the instruments *do not* deal often render the result still more exact. The point in dispute seems to be that, although exhaustive knowledge of all the factors is unattainable, I hold that we can extract a large amount of help from such approximate knowledge as we have, while Mr. Bedding considers this approximate knowledge quite inadequate to be of real assistance. I am surely correct in considering the formulæ issued with a plate as the result of the maker's judgment, in which case the "differences of opinion" to which Mr. Bedding refers are conflicting judgments whenever they involve error. (Word-splitting is not confined to my side of the discussion.)

Mr. Bedding says that, if a man cannot master the difficulties of exposure by the aid of his own brains, he will not do it at all, yet considers an inference which I have drawn, viz., that a youth who does not succeed as well as a companion who uses such aids must deplore his own want of brains and give the thing up, as unfair. Having Mr. Bedding's assurance that this seemingly obvious conclusion is unwarranted, I willingly withdraw it, and ask what the youth must do? Blunder on, or adopt the other's method?

I fear Mr. Bedding will have to take up my challenge for a good negative on an unknown plate himself, or it will remain unaccepted. By unknown I mean one of whose speed he has no idea. In such case as he names, he evidently would rather have the trade description than nothing. I would prefer something more definite than the row of xx . . . . x, unknown quantities, which figure as the only clue to the speed of the plates, or the vague direction, "Average exposure, one second."

I have recently handled two plates, one requiring about thirty times the exposure of the other. Is it not advisable to know which is which; and, if so, better still to know the actual speed of each? No. Look at the focussing screen, and find out by trial and error, unless I misunderstand Mr. Bedding's doctrine.

I am told I am unfortunate and rash in looking upon aids to exposure as the focus of others' experience, but no hint is given *why* that is so. Remembering what has been said about "mere empiricism" and "falsely-lying inspired formulæ," I think the matter should not be handled so guardedly, in terms so equivocal.

What I mean by "pinches and handfuls of light, advocated in preference to calculated quantities," can hardly be a matter of doubt to any one; the phrase carries its own interpretation.

As I have asserted that Mr. Bedding's paper does not touch any single principle of the instrument which I have defended, I will shortly state what these principles are. They are that the time of exposure varies (1) inversely as the actinic power of the light; (2) inversely as the speed of the plate; (3) inversely as the area of aperture of the diaphragm; (4) directly as the focal length of the lens.

Not one of these principles can be called in question, nor the combined result of all four. No individual judgment can modify, without introducing error, the verdict of the instrument as far as these principles are concerned.

But judgment is of value in dealing with extraneous conditions with which the instrument does not directly deal, such as the question of securing the representation of one of two violently contrasting terms to the sacrifice of truth of the other; *e.g.*, the securing of clouds at the expense of shadow details, or the reverse. Such considerations are noted by the issuers of the instruments, and the list is open to extension, providing ample scope for experience to assert its value. But, by limiting itself to its own proper sphere, judgment grows apace, though I leave open the question whether error will be eliminated to such an extent that the knowledge of how to correct it in development will become lost as a thing of the past. The mere hint of such a contingency following the use of the instruments in question speaks much in their favour. For my part, would that the art of doctoring photographic plates and human bodies alike fell into desuetude through the absence of need.

I cannot rightly gauge the photographer who prefers to make bad exposures now and then for the excuse it affords him of dodging the development afterwards. If such there be, they can still ride their peculiar hobby as often as they feel inclined.

My attention has just been called to a paper, signed W. K. Burton, in the JOURNAL for September 15, 1882 entitled "A Table of Exposures."

He says: "It is usual, in speaking of the exposure of plates, to say that the conditions are so very various that it is impossible to give any clue to the time which it is necessary to allow light to act, and that a knowledge of it can only be gained by experience. This, I believe, is not the case. It is true that *some* experience must be gained at the first start, but this experience may with advantage be supplemented by that which has been gleaned by others. . . . . The table proved so useful to many friends on their first taking up the art-science, that it has appeared to me that at least a few of your readers might derive benefit from the publication of it."

Can Professor Burton's table be fairly described as the "falsely inspired formula" of "mere empiricism?" Nobody dare say so, and I submit that it is unjust and incorrect to despise the authors of exposure tables and instruments because Mr. Bedding does not *know* them to be practical photographers! Has he tried to discover whether they are? Can he tell us of one who is not?

I would once more assure the student that there are better times in store for him than his predecessors have had, if he will but make intelligent use of their experience and painstaking research.—I am, yours, &c.,

Arts Club, Manchester, September 3, 1892. R. C. PHILLIPS.

"THE DECAY OF PROFESSIONAL PHOTOGRAPHY."

To the EDITOR.

SIR,—The sensible letter written by so clever and experienced a photographer as Mr. A. Wilson is known to be cannot fail to secure the unqualified approval of every professional photographer of repute. It was time, indeed, that the voice of a professional of standing should be heard on the question. In endorsing every item of Mr. Wilson's letter, whose experience is precisely similar to my own, and, I think, that of a host of other professionals, I should like to emphasise the passage of Mr. Wilson's letter where he says, "If I want a really useful assistant, I have to train one myself, or procure one from the Continent." The apprenticeship in vogue there is really responsible for the acknowledged superiority of assistants who, in most cases, have a good practical knowledge of the whole business, whilst they are generally experts in one or more branches of the same. Moreover, as a rule, they are not the spoiled young gentlemen who now often consent to be apprenticed.

It is all very well for chemists and other scientists, who very laudably have turned their attention to photography, to talk wisely about what the profession is, or ought to be, but are not professionals more fit to judge? Let these be heard, and I think it will be found, whilst all agree that the possession of a good chemical and scientific knowledge is essential, *that alone* is quite inadequate without a few years' apprenticeship. If it were not so, how is it that so very few of those gentlemen of science have built up reputations as professional photographers? As a matter of fact, a first-class artist is never found to be an equal expert at science, and, although there is no reason why a photographer should not be a clever scientist also, the artistic element must predominate, but the commercial part claims no less attention. At any rate, to achieve success, the aspirant, in my opinion, should be a good artist, with a sound knowledge of the business portion. The nature of the photographic art demands that the really good photographer should be sufficiently well acquainted with the science underlying it, for which reason it necessarily is included in the apprenticeship tuition. How is it possible, then, that a... i is art, commercial aspect, science, &c., can be learnt away from the studio? By all means let the tiro supplement his knowledge by giving the professors of the Polytechnic, Technical Institute, and others a turn, but he is in a better condition to profit by their discourse when he has served his apprenticeship. He will certainly be less likely to turn up his nose at the latter, should he not strictly adhere to the highly scientific language of the lecture-room.—I am, yours, &c. J. HUBERT.

September 6, 1892.

To the EDITOR.

SIR,—In the midst of much pressure on my time, I cannot refrain from endorsing the common-sense remarks written in your last week's issue by Mr. A. W. Wilson.

Technical class education is excellent, so far as it goes, but that is not very far in these latter days. Art education becomes of more and more necessity. Collateral with his science studies, the student should be connected with an art school, and obtain a solidly ground-in knowledge of anatomy, modelling, and lighting, and shading generally, and free-hand drawing. This is of ever-increasing importance, and no single minute so spent will fail to be afterwards remunerative.

When the pupil has attained a sound proficiency in these directions, if he will recognise that he is not yet an experienced photographer, as he may fondly imagine, but just in a position to commence his *real* education by serving some years in a good practical studio, then we might be easy about the future supply of photographers worthy of their name, and also both the artistic and financial prospects of our profession.

There is no decay of professional photography among men who are equal to supplying the satisfactory demand for, and appreciation of, better work engendered by the generally advanced art tastes at present manifest, but there is an inundation of fly-blown intruders, who insult the profession by imagining that they have it "at their finger ends" because they have been glamoured by their few months' results with a cheap camera and a convenient back yard, where, by the potent aid of a blanket background and materials generally on the button-pressing principle, they have created abortions of their suffering friends.

Photography has, doubtless, some nasty lessons in store for such people as seek to enter her ranks in this left-handed manner, and think they have discovered "a royal road to fame.' They, in conjunction with the solely theoretically accomplished pupil, will, I question, not find room to look longingly at stone-breaking as a more comfortable and withal profitable employment.

But who will bemoan that photography can thus assert her right to respect and legitimate devotion? Not I, for one. If it were only the puny, sickly process, some of the dabblers in it would lead us to conceive, judging by their results, then, indeed, might we expect its ultimate downfall.

There is no question, too, that the old conservative photographer nowadays finds his possibly technically good, but artistically doubtful, work received with increasing coldness as æsthetic taste advances. But here also the short-coming must be recognised as his own. It all points to the same end. Let photography cease to be regarded as a superficial plaything, to be less or more accidentally acquired; let its students, having suitable natural tastes, be educated up to its scientific, artistic, and practical possibilities, and I will warrant we need have no feelings of alarm for the process.—I am, yours, &c., LYDDELL SAWYER.

September 5, 1892.

UNIFORM SIZE OF PLATES.

To the EDITOR.

SIR,—Miss Barnes, in her paper read before the Birmingham Photographic Society, touches upon the question of "uniform sizes of plates"—"Our (American) size, notably for hand cameras, is 5 × 4."

I have always held that 5 × 4 should be the basis of our system; that is to say, it should be our quarter-plate, or 10 × 8 our whole-plate. Hand cameras of 5 × 4 are as readily carried and operated with as our present quarter-plates, and may serve for all the purposes of the quarter-plate as well, if not better, while an additional and exclusive lantern-slide camera of three and a quarter would be more to the purpose for that particular branch of work.

The question, however, arises, what would be the best "half-plate" between the sizes of 10 × 8 or 5 × 4? In America, the 8 × 5 size is used, being the exact half of 10 × 8, but it entails carrying a camera nearly as large as the present whole-plate, while the surface of plate is barely three-quarters of it. But if we take half an inch off its length, making it seven and a half, and add half an inch to its width, bringing it to five and a half, we have a plate of handy and pleasing dimensions, *slightly over* the half area of our (10 × 8) whole-plate, big enough to satisfy the angle of our vision as a picture, and entailing a weight of apparatus light enough to be carried by almost any one. Moreover, it may form the basis of a further international size, as it is the only one in inches which agrees with an acceptable size in centimetres, viz., 14 × 19.—I am, yours, &c.,

19, *Buckingham-street, Strand, London, W.C.*, J. R. GORZ.

September 5, 1892.

PROPOSED SOCIETY FOR STRATFORD.

To the EDITOR.

SIR,—I know of no photographic club in the districts of Stratford and Forest Gate, and if any of your readers who reside near this way would like to have one and join it, I should be glad if they will communicate with me on the subject.—I am, yours, &c., S. L. WILTON.

Longmore Villa, Romford-road, Stratford, E., September 5, 1892.

THE ACID SILVER BATH.

To the EDITOR.

SIR,—From your correspondent's—T. W. Edwards's—letter, I think there can be no doubt his trouble is caused by sensitising albumenised paper on a very acid silver bath. Some samples of paper turn a neutral solution of silver acid very quickly, and the addition of kaolin, with a little carbonate of soda, is quite inadequate to correct this tendency. Test the silver solution with blue litmus paper, and add strong liq. ammoniæ until blue litmus paper ceases to turn red. Repeat this whenever necessary, and be careful to *keep* the bath neutral, as, unless this is done, any change of toning bath will be of no avail.—I am, yours, &c.,

September 3, 1892. A. M. R.

Exchange Column.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPH REGISTERED:

James Grey, East Stonehouse, Devon.—*Photograph of Naval Barracks, Devonport.*

T. E. B., A. F. M., T. E. G., W. MORRIS, and others.—Received; in our next.

JAS. A. FORREST.—Many thanks; we will reserve your interesting letter and enclosure.

A. G. R.—The prints, judging by the very small strips you send us, are by the gelatino-chloride process.

PRINTER.—See article in the present issue. You, like many others, confound one process with another which is quite different.

"ACCURATE EXPOSURES."—The correspondent who writes us on this subject has neither completed his letter nor furnished his name and address.

N A FOG.—So far as we know there is no other reliable method of ascertaining whether your plates have been light-struck except by exposure and development.

PANEL.—1. Yes, there are "panel lenses" on the market, which will work at a speed of one second in the studio, provided the light and other conditions be suitable. 2. It increases detail.

J. DAVIS.—When the bichloride of mercury is applied it always darkens the film at first, but when its action is continued the image is whitened. You have been in too much of a hurry for the result.

PATENT.—If the invention is patented you have no right to infringe it, even if you make the apparatus yourself, and for your own exclusive use. You have no right to another person's property, and this the patented invention is.

R. HILL.—Large carbon prints, on thick paper, are best mounted with starch paste, and we are surprised that you have failed with it. Make the starch very thick, and apply it with a good-size piece of sponge, breaking up the lumps as it is rubbed on.

A. CORNWELL.—About the cheapest background you can have, and it will answer your requirements quite well, is a large piece of brown paper. This material may be had four feet six, or five feet wide, and in any length. It is sold under the name of carpet paper.

A. B. says: "I am an assistant, living in the house. My agreement was to be paid weekly. I have, however, let it run on eight or nine weeks. If my employer were to become insolvent, can I legally claim the full amount?"—Yes. In case of insolvency your arrears of salary would rank as a preferential claim against the estate.

AMATEUR (Strood) says: "I am about to erect a temporary studio in the garden. Will thick Willesden paper do for the roof where glass is not required? As I am shortly removing, I do not wish to go to much expense in the matter."—Willesden paper will answer quite well. Zinc is cheap just now, and that would be equally suitable and not expensive.

A. W. says: "When coating glass plates with gelatine for enamelling prints, a number of small holes or 'pits' form. I am told they are caused by fatty matter in the gelatine. Is this correct?"—The "pitting" of gelatine is generally ascribed to grease, but some maintain that it is not the cause. However, no more generally satisfactory explanation has yet been given.

S. L.—We are surprised that any manufacturer, even a foreign one, who had executed your order wrongly should dispose of the mounts, with your name upon them, to any other photographer. No respectable English house would have done so. The only remedy we can see that you have is against the purchaser, under the Trade Marks Act, for supplying pictures purporting to be of your production.

L. E. CLARK.—There is no reason why the report should not be correct. We have known more than one instance of an accident happening through the condenser of a solar camera being exposed when out of use. On one occasion considerable damage was done to the apparatus and the fittings of the enlarging room, and, but for the timely arrival of the fire brigade, the entire building would have been destroyed.

F. C. (Glos.)—1. If the photograph is not copyright, it may be copied for sale. 2. It will depend much upon circumstances. In this matter a solicitor versed in copyright law will be able to give a more reliable opinion than we can. 3. If the owner of the negative has a copyright in it he can certainly stop the sale of pirated copies and recover costs from the vendor. No doubt the owner of the negative will permit you to reproduce the portrait in the paper for a consideration. As it is his property, he is entitled to remuneration.

F. K. writes: "Can you, through your paper, give me some idea as to the cause of marks on enclosed photograph? It is mounted with starch, and the marks do not show till after the prints are burnished. A little help will oblige."—The marks are due to the mounts. The material with which the cards are surfaced is soluble in water; consequently, when the starched print is applied, the colour is partially dissolved. If one of the mounts be moistened with the tongue, the colour can be easily rubbed off with the finger.

R. DIMBERLINE.—You do not say what aspect the studio has, or whether you wish to work from both ends. Presuming you only desire to work from one end, fifteen or sixteen feet of glass will be sufficient for that width of studio, commencing, say, four feet six or five feet from the background end.

G. FENTOM says:—"In the dark room I have great difficulty in finding the right side of matt-surface bromide paper, and have lost many prints from putting the wrong side on the negative. Is there any way of judging the right side with certainty?"—If the point of the thumb and finger be slightly moistened with saliva, and an extreme corner of the paper be pressed between them, the coated side will be found slightly adherent. It will also be noted that the edges of the paper have a slight tendency to curl inwards. This is always on the coated side.

JAMES BENTLEY writes: "Would you kindly inform me what mountant is suitable for gelatino-chloride prints that have a glazed surface. I have used several, including shellac dissolved in spirit, but I get distinct marks and loss of glaze where the mountant has been applied."—There will be a certain loss of gloss whenever an aqueous mountant is used, if it be applied after the print is taken from the glass. If the mount be attached while the print is on the glass, and still moist, and then allowed to dry, the full gloss will be retained. A waterproof paper is sold by many of the dealers for attaching to the back of the print when it is squeegeed on the glass; then, after stripping off, the picture can be mounted with starch or anything else, still retaining the glaze.

REAPER says: "I wish to build a studio for business purposes in the garden in front of my house. On mentioning this to one of my neigbours he said it would not be allowed, as the town surveyor had power to prevent. I have bought a long lease of the premises, and the studio would not stop off any one's light. Will you tell me if any one can prevent me doing what I like on my own property, provided I injure no one else's?"—Without knowing all the conditions it would be impossible to give an opinion. The local authorities in every town have their bye-laws, and these, in the case of buildings, are usually stringent. As a rule, they have the right to reject or modify any plans submitted to them, and this they would certainly do if they considered the proposed erection would deteriorate the surrounding property. Better consult the town surveyor in the first instance.

OLD SCOTTY.—1. We have not tried the hand camera alluded to, but it is said to be good. 2. A lens working at *f*-8 is quick enough for street subjects with moderately rapid plates. 3. In saying that the "chromotype process" was practically obsolete, we were referring to the original process of Lambert. This formed the subject of a patent which has long since expired. For the process a special tissue was supplied, but only to licensees. Eventually it was found that the pigments of which it was compounded, or some of them, were fugitive with exposure to light. Its manufacture has now, we believe, been discontinued, or it is only made to order. The process itself (that is, with ordinary tissues), which consists in developing the carbon image on collodionised glass, and afterwards transferring to paper, is still practised somewhat extensively. You cannot do better than give the process a trial. The tissue is now supplied in small quantities, ready sensitised, which much simplifies the working. If you require variety you might try the gelatino-chloride printing-out paper.

ERRATUM.—In the second paragraph of Mr. Dunmore's letter on "Decolourising Shellac Varnish" in the JOURNAL of last week, "a glass flask of four ounces" should read "a glass flask of *forty* ounces."

PHOTOGRAPHIC CLUB.—September 14, *Transparency Printing*. 21, *Photographic Fallacies*. Outing, Saturday next, September 10, Greenwich, under the leadership of Mr. A. Haddon. Boat from Old Swan Pier at two o'clock.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.—September 15. Out-door Meeting to Gilsland, Nawarth, and Lanercast. Train leaves Central Station, Newcastle, at a quarter past eight a.m. for Gilsland Station. M. Auty, leader.

THE WEATHER AND PHOTOGRAPHIC SOCIETIES' OUTINGS.—We received the following report of the outing of a photographic society last Saturday:—"Seventeen present; a soaking wet day; plates exposed, 0. Programme:—Drinks, smokes, nap, dinner, return."

NEW MONTHLY SUPPLEMENT.

IMPORTANT NOTICE.—*With the* JOURNAL *of Friday, October 7 next, and on the first Friday of each succeeding month from October to March inclusive, we shall issue a special gratis supplement, devoted to the interests of the makers and users of the optical lantern, in which every phase of the subject will be treated by the ablest authorities. This step, which has been in contemplation for a considerable period, is necessitated by the increasing popularity of the lantern in its numerous applications, scientific and domestic.*

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

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ON DRY MOUNTING.

Involved in the novelty and excitement of experiment, or the reduction of experiment to practice—new developers, new modes of development, new papers, new cameras—the claims of old processes and methods, whatever their value, have little chance of being heard a second time when once their advantages and methods have been clearly set forth and adopted, or allowed to fall into oblivion, as the case may be. The adoption of the almost universal sulphite of soda might be looked upon as an exception to this dictum; but it really is not; for, though its advantages were plainly set forth by its lamented inventor, the late Mr. H. B. Berkeley, and it was left absolutely unnoticed for a time, its ultimate popularisation was only due to repeated and entirely disinterested efforts on his part to force it into notice. Among other valuable methods of work hitherto fated to semi-oblivion is that known as "dry mounting." It is not said for a moment that this mode of mounting has no followers; there are many photographers in the country who adopt it, and have nothing but praise to say of it. We unhesitatingly state that if once it be given a fair trial (using a little of Opie's "medium") there is little chance of any other mode of mounting being again made use of for any except the larger sizes of work. There are, of course, difficulties attendant upon the inceptive operations, but in this dry mounting is no exception to a general rule. If the query be put, "What are the advantages of dry mounting?" it can be concisely replied to. By its aid prints can be finished off ready to deliver far more quickly than by the older plan. When finished, they are better done, and the mounts do not buckle or curve. A dozen cabinet or larger prints so treated will lie in a heap as flat as a pack of cards, and will preserve their flatness though left exposed singly to the air. Even with the most accurate and careful mounting by the old method, the curl—slight sometimes, oftener, perhaps, considerable—will make its appearance even with a heap of mounted pictures, while single ones almost invariably assume a twisted or bent aspect, the contrast in the general appearance of finish between the two being most marked. Then, again, when, as occasion sometimes necessitates, a print has to be removed from its mount, it is done with far greater ease with one dry than wet mounted.

It may be asked, "What are the disadvantages of the method?" and to this we may reply that they are two in number and insignificant. Firstly, to dry mount with greatest ease two people have to be at the work together, though it can readily be done by one. Secondly, it is very difficult to dry mount neatly upon enamelled cards. When a mount of this kind is once damped a portion of the surface gloss is removed, and a smeared appearance given to the mount through the uneven surface so produced. Further, it occasionally happens that, either from the damping sponge or a setting off from the surface of the rolling press plate, a little enamel is transferred to the face of the print, and is very difficult of removal. These are all the disadvantages likely to be encountered.

As to how to set about dry mounting, the process, though it has been described often enough in these pages, will bear repetition in connexion with this attempted quasi-resuscitation. The prints are first coated with mountant in the usual way, and when the latter is dry they are ready to place on the card as follows: The card itself is damped by a moist sponge being passed over it. The print is then laid in its place, and being kept there with the fingers, the thumb being under the card, it is laid upon the plate of the ordinary rolling press, and at once passed through, when the mounting is complete, and the mounted picture ready to send out on the spot.

This is the bare outline of the method; a few details may be filled in. There is no need to dry the prints before pasting; they may be taken in a heap from the washing water and pasted after draining the water away. It is, however, better to lay them evenly on one another before pasting. Any of the ordinary mounting materials may be used—starch, gelatine, gum, &c. It must be laid on as evenly as possible, as, otherwise, streaks may appear. Some photographers paste before cutting, while others who trim their prints previous to toning necessarily paste after cutting. The advantage of the former method is that there is no fear of any smear from the mountant appearing at the edge of the print, and also no danger of the print being imperfectly pasted at the extreme edge, that being the place where there is greatest possibility of an insufficient application of mountant.

The advantages of rapidity of mounting will be seen at a glance. A print may be taken straight from the washing water, the surface water blotted off, the print pasted, dried by the fire, cut, and mounted, and be ready for delivery in less than a quarter of an hour. It will, however, be found in practice that spontaneous drying in a warm atmosphere is better than drying before a fire or over gas, as it is our experience that the latter way tends to produce cockled prints, which are much more difficult to place in position and send through the press. We have only to repeat that, given a fair trial, the process will commend itself to every one who endeavours when attempting it to make it succeed.

ACCURACY OF PHOTOGRAPHIC APPARATUS.

Although it is customary to regard the path of the modern amateur photographer as infinitely smooth compared with that along which his predecessor of fifteen or twenty years ago had to travel, there are occasional small obstacles he has to encounter, which perhaps are all the more difficult to bear with an equanimity of mind since they are not of his own creation. For example, it is the occasional worker who more than his professional *confrère* is perturbed and inconvenienced by the inaccurate manner in which commercial glass plates are cut, since in all probability he is not the possessor of a diamond, which would enable him to readily remove the offending protuberances, and hence the plates have to be wasted. As a rule, we know that in all commercial dry-plate factories such care is observed in the examination of the coated plates for general and particular defects that we are surprised more attention is not bestowed on accuracy of cut.

Many occasional photographers will sympathise with a correspondent of a few weeks back, in his suggestion that the small turn back pins, which in the majority of dark slides are used to hold the opaque division between the plates *in situ*, should be made so that they could be more easily moved. Too often each pin is so affixed to the sides of the slides that a knife, or some other sharp implement, has to be requisitioned to move it, the finger tips being quite inadequate for the purpose. This is one of those small details which, if carefully attended to, save an amateur considerable trouble, and possibly labour, in substituting something more effective.

We have spoken of the inaccuracy of cut of many glass plates, and it may therefore read rather paradoxical if we now venture to complain of a too great exactitude on the part of many makers of photographic cameras; but it is nevertheless true that for practical purposes it is possible to have too great an accuracy in those respects, particularly in the dimensions of the slide rebates. Very often we have observed that these measurements are so precise, that if an accurately cut plate be inserted in the slide after exposure it is only to be removed by the friendly aid of the penknife, or even in some instances the application of pressure to the film side of the plate, a by no means pleasant resort if one is developing, and the fingers are wet or damp with the solutions. Here we have indicated two common sources of what we shall term dark-room annoyances, which a little forethought on the part of the makers would obviate.

Makers of the highest class of apparatus are, we believe, in the habit of subjecting their productions to a practical examination with a view to ascertaining whether they are in such a state of efficiency in details as to warrant their being placed in the purchaser's hands for immediate use. This is as it should be. Of late years, however, the long-sustained demand for cheaper articles has led to the dissemination of a great deal of photographic apparatus in which, by the necessities of commerce, the manufacturers are unable to afford the time to practically test it, or to bestow so much care upon those and other details we have referred to, the onus of so doing being therefore cast on the purchaser, for whom it cannot be agreeable to have the ordinary difficulties of photography supplemented by others for which nothing but a slenderness of purse makes him responsible.

Another and a most frequent source of annoyance in the use of the camera out of doors is the singular habit of many makers fitting the dark slide to the back of the camera with apparently as much precision as possible, so that, as we have noticed with very many cameras that have passed through our hands, the slide (where it partly or wholly slides instead of fitting in) can only be pushed home with difficulty. For such ideal precision there is not the slightest necessity, and the consequence of it is, as we have frequently noticed, that when the view is focussed, and the slide is being pushed into the camera, it is only by the greatest adroitness that the camera, stand, and all are not displaced from their position. A tolerably free movement is not only desirable but necessary for comfortable outdoor work. In the case of the camera and slides having got damp, the evil of a too accurate fit is, of course, intensely aggravated.

These are some of the many extraneous difficulties which the aspirant has often to encounter in the pursuit of his new-found hobby, which it should surely be prudent of the manufacturers to remove; but there are others to which we may advert another time. It is annoying and troublesome enough for old and experienced photographers to have to cope with these and similar obstacles to successful work; to the occasional worker it is often the cause of failure.

M. Lippmann's Colour Method.—Mr. Hermann Krone in Wiedemann's *Annalen*, gives an account of some further experiments connected with the photography of spectra in their natural colours by Lippmann's method. He finds that the correct rendering of the various colours depends upon a high degree of accuracy in the proportions of the finely divided silver haloid and the colour sensitiser, as also upon the temperature of drying, the exposure, and the development. If the essential conditions are not fulfilled, it may happen that yellow appears in the place of red, or that green exhibits a direct transition into violet, the blue being unrepresented. The result also depends upon the amount of water contained in the film, as influencing its thickness, and in the case of the solar spectrum upon the altitude of the sun. With a very long exposure the infra-red appears as a dark purple, and the ultra-violet as a yellowish-pink lavender colour. Mr. Krone has also succeeded in producing coloured photographs without Lippmann's mercury mirror. He simply covers the film with black velvet, exposing, as Lippmann did, through the glass. In this case, the reflection from the inner surfaces of the glass takes the place of that from the mercury. The exposure has to be considerably prolonged, and the colours towards the red end are less pure; but the blue, violet, and ultra-violet are quite as brilliant and well defined as in the mercury process.

Reversed Negatives on Gelatine Plates.—According to our report, it was stated at a meeting of the London and Provincial Photographic Association the other night, that reversed negatives for photo-mechanical purposes are produced, by one process-worker by taking advantage of the circumstance that an ordinary gelatine plate in contact with a negative will, if exposed long enough, yield on development a negative instead of a positive. We were not previously aware that this phenomenon was put to any practical use. It appears, however, that success is only assured with certain makers' plates.

The Growth of New Societies.—We always welcome the advent of new societies as evidence that photography is still in a state of expansion, but that feeling is subject to the qualification that in the district selected there is legitimate scope and demand for the establishment of such an association. This, however, we have regretted to notice during the last year or so, has not invariably been the case, several societies having been started, or attempted to be started, almost next door to ground already occupied. As one good big society, in our opinion, stands a better chance of doing serviceable photographic work than two small ones, we hope that unattached photographers will, where possible, join existing organizations in preference to starting societies which are not imperatively called for.

Fugitive Pigments.—It is very clear that, although some photographers consider the permanence of their pictures as a matter of importance, they pay little or no attention to the stability of the colours with which they are finished. We were forcibly reminded of this a few days back when seeing at a suburban railway station a carbon picture—an enlargement—that had evidently been exposed there for some time. From its appearance we judge that the print had changed somewhat, though very little, from the fading of the pigment employed to give warmth to the colour. The picture had been finished in monochrome, and the artist, in matching the tint, had used a fugitive colour—probably a cochineal lake or crimson. By the action of light this colour had been quite discharged, so that every stroke of the brush, or stipple, showed as a decided black line or dot in strong contrast with the delicate tones of the picture. We have frequently referred to the fugitiveness of the pigments now in use for general printing purposes, particularly in photo-mechanical processes, notably in collotype. At one of the stations on the same line of railway as the above picture is to be seen an advertisement, the capitals in which were printed in scarlet ink, the rest in black. The scarlet has been discharged, and what was once Gracechurch Street now reads "racechurch treet" at a distance of a yard. The reading of some of the other parts is equally as ludicrous.

Serious Explosion.—An accident, by which four persons lost their lives, occurred in Paris on Saturday last. As a similar accident is liable to occur to any one employing collodion, the circumstance requires a passing comment. It appears that the wife of an enameller of photographs, in handling a large vessel containing collodion, accidentally let it fall. The vapour from it mixed with the atmosphere, and reaching a light exploded, shattering the house and also setting it on fire. It may not be known to all the users of collodion that the vapour from ether, and alcohol also, when mixed with a certain proportion of air forms an explosive compound like a mixture of coal gas and air. Therefore, whenever a bottle of collodion is broken, all lights, even those at a distance, should at once be extinguished, and the apartment freely ventilated. As the vapour of ether is much heavier than the atmosphere, the lights below the level of the spilt collodion should receive attention before those above. If we mistake not, Mr. Valentine Blanchard, many years ago, met with a similar accident to that in Paris, in which he was seriously hurt and his premises destroyed, but, providentially, no lives were lost.

Pyroxyline.—Collodion is still largely used in photography, and, as most persons are aware, its character is mainly dependent upon the pyroxyline used. Some samples, for example, will yield as viscid a solution with two grains to the ounce of solvents as others will with six or eight. Now, it is manifest that, where a film of a given thickness is required, the more pyroxyline that can be got into a workable solution the better it will be. The film will be quicker dried, and, as less solvents are used, there will be considerable saving of cost. The specification of a patent for improvements in the manufacture of pyroxyline has just been published. By this improvement the patentee states that a collodion can be made containing from twenty to twenty-five per cent. of pyroxyline. The method is this: The cellulose is subjected to a temperature of from 150° to 170° for from four to eight hours. It is then immersed in the acid while still hot. By this treatment the inventor says the cellulose is modified by the heat attacking the foreign and incrusting matters so as to prepare for their destruction in the acid. As the photographic properties of collodion are largely influenced by the character of the pyroxyline, it will be interesting to see how this particular kind will behave in the collodio-bromide and the collodio-chloride processes, also in the wet-collodion, process which is still extensively used for some purposes.

Surreptitious Photographs.—According to the report in a daily contemporary, two Americans have been detected at Quebec taking sketches and photographs of the engines and guns of one of the British cruisers lying in that port. The report adds that the sketches as well as the photographs were seized and destroyed, and that the two alleged spies have disappeared. Now that detective cameras are disguised in so many different ways, and concealed in waistcoats, hats, neckscarves, &c., and tele-photo lenses practically ignore distance, the authorities will have to be exceedingly vigilant if they wish to prevent their armaments and fortifications being photographed surreptitiously.

Professor Hale's Sun Photographs.—At the late meeting of the American Association for the Advancement of Science, Mr. George E. Hale, of Chicago, read a paper on *The Spectroheliograph of the Kenwood Astro-physical Observatory, Chicago, and Results Obtained in the Study of the Sun.* He described the apparatus he had invented and perfected for photographing the faculæ and protuberances of the sun. This apparatus is the first which has successfully photographed the bright spots, showing faculæ which the eye cannot detect. Means were devised for taking on the same plate at one exposure both the faculæ and the protuberances, and Professor Hale exhibited the first complete picture of the sun ever taken. Comparison with the best plates made at the Lick Observatory showed the great superiority of the work at Chicago. An observation of unusual interest was made on July 15, 1892. A photograph of the sun showed a large spot. A few minutes later another photograph was taken, which, when developed, showed that the bright band had appeared since the last exposure. Twenty-seven minutes thereafter another photograph showed that almost the entire spot was covered with brilliant faculæ, which, by the end of an hour, had entirely disappeared, leaving the spot as at the first exposure. This indicates an eruption proceeding with indescribable and inconceivable velocity. This disturbance seems to be connected with magnetic disturbances and the brilliant aurora noted the next day.

A STANDARD DEVELOPER.

The necessity for a standard developer has been a want long felt, but one that so far has never been satisfactorily fulfilled. By this term we do not mean a developer for landscape or studio purposes, but rather for use on the scientific or technical side of photography, more especially for sensitometric and similar purposes. For such work two chief conditions are necessary, a standard light and a standard developer, and clearly the former is of little practical use if a developing solution of a uniform character is not available.

It is not our purpose here to discuss the question of a standard light beyond expressing the opinion that, though such in its strictest sense has yet to be found, there already exist several methods by which a sufficiently near approach to conformity of illumination can be secured for photographic testing purposes where the highest degree of scientific accuracy is not required. We cannot, however, claim as much for the developer, the conditions surrounding which have hitherto been so variable as to baffle all efforts to produce a solution of unvarying energy and universal applicability.

So far as the standard light is concerned we are able, as already remarked, to satisfy the requirements of photography at least to the extent of comparing the practical sensitiveness of different plates or batches of plates, though there are one or two other points upon which there may be some difference of opinion as to whether the results are trustworthy. In fact, it has been doubted whether any one light or any one developer is of any value in the comparison of plates or films in which the sensitive salts are different or which have been prepared in a different manner.

That plain bromide films differ in their relative sensitiveness to different coloured rays from those in which there is an appreciable proportion of iodide is a scientific fact beyond dispute, and therefore, in employing as the standard light one that is comparatively poor in blue and violet rays, such as gas or candle-light, a fictitious superiority will be given to plain bromide over bromo-iodide films by the sensitometer, although the latter may be fully as sensitive, or even more so, when exposed in the camera. This, however, is a fault of the light employed, and has nothing to do with the question of a standard developer.

Then, again, films differing in composition behave differently under the same developer, some developing rapidly to full printing vigour, while others require a much longer time to produce the same density

of deposit and also the same amount of detail. This has caused the question to be raised, in making sensitometer trials, whether a fixed period of development should be adopted in conjunction with the standard light and developer, or whether the latter should be allowed to act so as to "get out as much as possible" from the exposure.

It has always been our opinion—and this is strengthened by the recent researches of Messrs. Hurter & Driffield—that the latter is the proper plan, for, after all, it is the exposure, and not the development, that chiefly rules the result. If one film with a given exposure will produce a certain result in, say, five minutes' development, and no more can be got out of it by prolonging the action, while another gives precisely the same result in ten minutes, it is clearly unfair to stop the development of the second at five minutes, and dub it less sensitive than the other. It is equally sensitive, though slower to develop; and, if the conclusions arrived at by Messrs. Hurter & Driffield are correct, the gradations in both cases will be alike, provided the full time be allowed in each case. This point may therefore be put on one side, and we can proceed to consider the developing solution itself, with a view of seeing whether it can be reduced to a standard.

Briefly, the requirements in such a solution are, first of all, uniformity of composition, and strength, and also of temperature, or rather non-liability to vary in energy from slight variations in the latter respect. The first condition involves the power, not only of mixing the solution invariably of one uniform strength, but also of keeping it at that strength without deterioration; and if we take into consideration the practical impossibility of mixing small quantities fresh just when required, and the difficulty of accurately measuring minute quantities of stock solution, it will be seen that the uncertainty likely to arise from purely mechanical causes is not inconsiderable. We may now proceed to inquire how the different forms of developer are likely to answer these conditions.

Let us commence with ferrous oxalate, as differing in composition from the remaining developers of the alkaline class. This, as usually made by the mixture of solutions of ferrous oxalate and oxalate of potash, provides an apparently easy means of forming a developer of constant strength; but, upon closer inquiry, we shall find that the desired uniformity is not so readily attained. In the first place, the use of "saturated solutions" has been so frequently condemned on account of their indefinite composition, that we need not say more than that this plan is entirely out of the question, owing to the very great variations in strength that would result from changes of temperature. Even when the solutions are reduced in strength considerably below the saturation point at the normal temperature of 60° Fahr., they are far from being of a permanent composition, unless the temperature of the laboratory is kept constantly at that point. If a chance depression of several degrees occur, some of the salts will be precipitated, and, though the normal temperature may be restored, the crystals deposited will remain at the bottom of their respective bottles until heat and agitation are applied to effect their re-solution. The constant necessity for such treatment whenever a small quantity is required for use would alone suffice to deter a busy photographer from adopting this developer.

But one at least of the two solutions is far from being a permanent one. Ferrous sulphate in solution, as is well known, is subject to rapid oxidation, and, when this occurs, not only is the solution itself weakened, but a powerful retarder is formed in *ferric* sulphate, which becomes ferric oxalate in the mixed developer. Even when acidified with sulphuric acid, this change goes on, though more slowly; so here, again, the difficulty of keeping a solution of standard strength is evident. The mixed developer is spontaneously far too readily oxidised to allow of its being kept for use in that state, so that it is not difficult to recognise the thorough unsuitability of ferrous oxalate as a standard.

We come next to pyrogallol, which, as a developer for negatives, is still regarded by most photographers as the most reliable. But as a standard it presents several disadvantages. Its rapid oxidation and loss of energy in solution is the first obstacle to its use, necessitating ts preparation fresh each time it is required for an experiment, and we need only point to the irregularities likely to occur in weighing out quantities of a few grains at a time to prove the impracticability of this plan. When kept in stock solution again, not only does the difficulty of accurately measuring small quantities arise to cause uncertainty, but the sodium sulphite employed as a preservative supplies material which by oxidation introduces a gradually increasing proportion of restrainer. Thus, without enumerating any other objections, we can estimate how small are the chances of securing a standard pyro developer.

Hydroquinone possesses better keeping qualities in solution than pyro, but it suffers from the awkward failing of varying greatly in its action from very slight changes of temperature, and, owing to its comparatively low degree of solubility, its stock solution is, from the same cause, extremely liable to variations in strength from precipitation. An additional objection to this developer when employed with films of varying composition is the very different manner in which it behaves with the several haloids of silver, so that it becomes impossible to secure any reliable comparison between any but plates known to be of the same character. For these reasons, then, we are compelled to discard hydroquinone, although it forms an admirable developer for negative work generally.

Eikonogen, the next on the list, affords perhaps a better chance of supplying what we want; but here, again, the difficulties in connexion with stock solutions and its want of solubility militate against its ready adoption. While the objection caused by the oxidation of the sodium sulphite remains, the difficulty arising from the measurement of small quantities of stock solution, as well as the risk of precipitation, are avoided by diluting the solution to the actual strength for use; but then we are met by the new objection that the weaker solutions, whether of eikonogen, hydroquinone, or pyro, are deficient in keeping properties, and so placed out of court.

Para-amidophenol and its hydrochlorate, two of the newer introductions, present a better chance of success since, although so very feebly soluble in water, the solution of the strength for use keeps tolerably well for a day or two at least, and being a one-solution developer the difficulties attending the mixing of small quantities of liquid are avoided; but for a practical standard solution we require one with considerably greater keeping properties.

With regard to one-solution developers generally the same remarks apply. It is practically impossible to secure accuracy and uniformity in measuring out small quantities of the stock solutions for the development of, perhaps, a single test plate, and when diluted in quantity they lose their keeping power, and become subject to rapid oxidation.

The nearest approach to a fairly accurate standard appears to be the most recent addition to our list of developers—amidol—which, from the slight tendency to change presented when exposed to the atmosphere in dilute solution, seems to offer a way out of the difficulties mentioned in connexion with its older rivals. It is true the objection to the presence of sodium sulphite remains; but, looking at the comparatively small effect exercised on its action by restrainers, it is possible no ill, or comparatively little, may result from this cause. At least, it is worth a trial as a standard, and, if further experience with it prove that it behaves in a fairly uniform manner with the different haloids, it is not improbable that at any rate an approximation to a standard may be attained.

Not every photographer is in a position to test his plates by Hurter & Driffield's method, nor is the consumption of plates confined to those of makers who have adopted that plan of marking their rapidities. Until the practice of so marking them becomes general, the want of a standard or absolutely uniform developer will be felt.

CONVENTION JOTTINGS.—VIII.

A Run through Some of the Scotch Studios.

E. M. & R. W. Sharp (Hamilton).

In our many visits to Scotland we have observed that the photographers in the small towns there show more enterprise and pluck than are to be found in places of like population in England and Ireland, and also that there is not a place with any pretensions to a population at all in this country that does not boast of a photographer, and, as a rule, of no mean hand.

When in Glasgow we made a run out to Hamilton to inspect the premises of E. M. & R. W. Sharp, who have for many years held

sway as the photographers of Hamilton and district. Mr. R. Sharp and his sister are the active partners in the business, and it has their daily personal attention. Years ago this business was started, as such businesses usually are, by having a glass-house built behind the cottage home, and here they worked on till the place became too small for their increasing trade, and they resolved to build in the centre of the town, and the place erected is certainly an ornament to the street in which it has been placed. The whole design is of old English pattern, two stories high, and pleasingly attractive; but Mr. Sharp had considerable trouble before he could get his plans carried out. The Town Council had decided that the only form of building to be put up in the street was the severe, sandstone, plain-front edifice, and as his plans were far too ornamental and quite unsuitable they were thrown out; but Mr. Sharp was not to be beaten, so he applied again and again, till they thought better of it and gave in, and now we fancy that the obstructionists will be pleased that they have let him have his way, as the building is quite pretty and attractive.

A broad flight of steps goes straight up from the street to the first landing. The steps are composed of stone and white marble. On the landing facing you as you ascend is a draped mirror reaching from floor to ceiling, with a broad setting of flowers and plants all round the foot, which gives quite an airy, outdoor feeling to the surroundings. Around this flight of steps is a square-pillared balcony, from which the various rooms are entered.

The walls are finished in panelled wood of a light colour, varnished, with a dado of dark oak reaching up to about three feet from the floor. The showrooms and dressing-rooms are furnished with considerable taste and comfort.

The studio is fifty feet long by twenty-one feet wide, and constructed on the ridge-roof plan, being fairly well filled with glass from end to end, but it does not reach within three feet of the floor. We thought that this must interfere with the bottom lighting, but he has so much light and so much space in his studio that there is no interference whatever. He can take pictures in any part of the place, working both ends and also across the centre, having the place so well *blinded* that he can get any lighting he desires. His "boat" and other fancy pictures, where set scenes are necessary, he works across the studio, and the fittings always stand ready for use, never interfering with his ordinary work.

A balcony runs round the outside of the studio connecting the printing place, which is situated at the back of the studio.

His dark rooms are large, well aired, and fitted with all modern appliances. In the burnishing-room we saw an operation that was quite new, and which commended itself to us as a very good thing. Mr. Sharp goes in for the highest enamelling burnisher, and consequently is working Globe burnishers up to twenty-inch roller.

One thing that is insisted on by the makers of high-glaze machines is that the pictures and the mounts that they are affixed to must be damp all through if the best results are to be obtained from the machine. Now this damping process has always presented considerable difficulty, for surface dampness does not meet the requirement, and the following method is how Mr. Sharp has surmounted the difficulty. Mr. Sharp has a sink about four feet by three feet, to the bottom of which he has fixed uprights about six inches high. On these uprights he has a metal wire network nailed all over the sink; on this network he places his mounted pictures of every kind, then he runs hot water into the space below the netting, when the steam from the water renders both mount and picture perfectly moist all through in a short space of time. Another apparatus for the same purpose, which we also saw in use, was a square metal box, standing pretty high, fitted with trellis-work shelves, on which the pictures are placed; the water in the bottom being heated, and the steam passing up through the opening in the shelves, produces the desired results.

Mr. Sharp says that the damper the pictures are the better—not to be actually wet, and, on inspecting his burnished work, we felt that he knew all about it, for it was faultless.

Might this not be the reason of so many failures with these machines—for we know of many failures, especially when operators are about to use them first—this surface damping, instead of having mount and picture moist through and through? Mr. Sharp has made quite a feature of the midget picture in his place, nor does he sell them at the usual 2*s.* 6*d.* a dozen, but he touches them up and sends proofs, and supplies at 4*s.* a dozen. And he says, "Though a small thing, it has so grown upon us, that it makes quite an appreciable difference on our year's return." Group, cabinet, and *carte* work is their staple trade, and, like all successful photographers, they must stretch out, so they have had a branch establishment built at Coatbridge.

This Coatbridge branch is arranged on much the same lines as the Hamilton place, and is run by Mr. Sharp's brother-in-law. To fill up his time in the winter season he has introduced magic-lantern entertainments, which have proved a considerable source of profit, his apparatus being of first-class manufacture. His entertainments are of the best; and also, in imitation of larger towns, he has had a sheet fitted on the top of his studio between the flag-posts, where he gives nightly shows—a combination of pictures and advertisements. This seems to us to be a very good method of popularising and extending the knowledge of a place.

T. & R. Annan & Sons (Sauchiehall-street, Glasgow).

T. & R. Annan & Sons, photographers and photo-engravers to Her Majesty the Queen by special appointment, have just opened their new studios and fine art galleries at 230 to 234, Sauchiehall-street. Their previous place of business was at 153, Sauchiehall-street, but they have obtained more advantageous and commodious premises at No. 230 for their special business.

The whole premises have been planned and worked out on æsthetic lines. The entrance-way is fitted with bevelled glass cases, forming windows, with an antique filled-in door between, the arch of the entrance-way being surmounted with the royal arms, a combination that makes a very imposing front. The stairway is fitted with a pillared rail of a light construction, which is very graceful. The steps of the stairs themselves are set in with a black and white diamond pattern, which gives a lightness and effect to the surroundings. The walls are hung with a drab-coloured rough cartridge paper, quite plain, but pleasing. The showrooms and studio are worked out with the same artistic ideas, which we felt rather severe, although charmingly simple.

In the showrooms the wall paper is a neutral drab tint, and the arrangements for hanging the pictures were to us new, and the method very effective. A wooden moulding—same style as a cornice round the room—is fixed on the walls about three feet from the roof, and on a projection in this moulded pattern the brass hooks for hanging the pictures are fixed. The floor is covered with a bordered carpet in the centre, and all around the wood floor, finished in green paint, is left uncovered. The pictures on the walls are not many, but well chosen.

The studio is got up on the same lines; it is large and commodious, and capable of any amount of work. It is forty-five feet long by twenty-five feet wide; the side is fitted with rolled glass, which should give a good diffused light.

Quite irrespective of their portrait trade, which is considerable, the Messrs. Annan stand in the front rank for outdoor work of all kinds.

And in these new premises they have fitted up the plant, and are working their photogravure process, which is now so well known and so highly appreciated, as a mechanical process, whereby the most artistic renderings of pictures are produced. We visited the various rooms set aside for this manufacture, the first of these being the one in which the plates are prepared and made. We anticipated that it would have required a darker room for this work, but it does not require this. As far as light is concerned, the work goes on with great comfort. The printing-room follows next; it is fitted with the usual copper-plate presses which are used in the production of the picture. Photogravures on mounts thirty by twenty inches can be worked by the presses we saw in operation. The next was the drying-room, which is kept at a high temperature. Here the photogravure work only is finished.

At their works at Lenzie the carbon, bromide, platinum, and silver printing papers are all manufactured. Here we saw a picture of the *Fairy Raid* in carbon on an opal plate 44 × 30 inches, which for finish was as fine a thing of the kind we have ever seen.

Mr. James Annan and Mr. D. Y. Cameron, the artist, have just returned from a tour, the product of which is a very fine series of pictures that are now being prepared for exhibition in these galleries. "Notes from the Netherlands" is the intended title for the show, and it is expected to be opened in October. From the specimens of pictures that were shown us, many of which were finished in carbon, brown and red, and other examples etched, and embracing as they do most taking and popular subjects in water scenes, rustic scenes, landscapes, groups of children, &c., they are sure to make a successful exhibition, and be the means of drawing many visitors to the new premises.

ADVANCED PHOTOGRAPHIC WORK FOR AMATEURS.

IX.

In a previous article I referred to the production of combination prints from two or more negatives, and instanced how by a simple method of blocking-out such may be produced.

It frequently happens, however, that combination pictures have to be produced from two or more pictures or photographs in cases where the original negatives are not forthcoming. A very common case in point is where it is desired, say, to combine a group of six or more heads into one negative, so as to print by one operation a photograph of the entire lot nicely grouped together. In undertaking such an operation much of the ease in manipulation will depend on the nature of the various heads as they happen to present themselves. In cases where a decided similarity of style and size present themselves, the work will be greatly simplified; but it seldom happens when a number of heads have to be grouped together from photographs gathered from various sources that such are of similar sizes, or so posed as will just at once permit of their being grouped so as to make a pleasant combination as a whole. It therefore becomes necessary to fix upon a uniform size, and proceed to copy each individually. This is in itself by no means a difficult operation, the best method being to place each photograph in a printing frame carrying a sheet of glass, and pressing the back of the frame tightly up; the picture will show no grain when copied through the glass. A novice who first attempts to copy a picture having a sheet of glass in front of it, may find some trouble in getting over the difficulty of avoiding reflections from the front of the camera and other objects in front of the frame; these are reflected from the glass, which acts much as a mirror would do. Practice, however, will enable even the most trying cases to be overcome. I have often been sorely tried to avoid these troublesome reflections, but I have never yet met in with a case that did not yield to a downright hard fight to overcome them.

On my copying camera I have a large cardboard front, in dimensions about thirty-six inches by fifteen inches. In this I have an aperture cut that permits the lens just to peep through. The front of this cardboard is lined with an absolutely dull, black paper. Some thought must be exercised in getting the proper black paper; the glossy surface kind is not the proper sample. The best paper I ever saw for the purpose I got from Mr. Falconer, a jewel-case maker in Glasgow. It is absolutely matt, and can by no means throw back any reflections. It is far and away better than black velvet, and is easily attached to cardboard or any other suitable material that is used as a shield. When pictures have to be copied that do not require the camera (provided a short-focus lens is being used), being situated at any great distance from the copying frame, this cardboard shield will generally be found sufficient; but in cases where the lens is, say, three feet from the glass of the frame, then it often becomes necessary to also interpose a further preventive against the reflections from the table or copying board that is being employed to carry the camera. A sheet of good black paper laid flat on a cardboard will entirely prevent reflections being thrown upwards, and sometimes in very obstinate cases, a few sheets of black paper pasted together so as to form a curtain and hung up behind the camera will work wonders in preventing ghosts, which in nine cases out of ten are nothing but reflections. In speaking of ghosts I do not here refer to those double images caused by the use of inferior or unsuitable lenses.

The difficulty of overcoming these reflections when copying is sometimes great, but they are preventable, and no amount of labour should be spared to banish them. Their presence is easily observed by merely looking at the surface of the glass in the printing frame from a direction almost on a line with that of the lens, but when such precautions as I have mentioned are taken they will be overcome.

With a well-arranged system, therefore, of copying so as to overcome reflections, the copying of one or more photographs by daylight is a matter of great ease, for no matter what size the prints are they can easily be reproduced of a similar size.

Having, therefore, made good negatives from each, let them be varnished and retouched. Some amateurs stand aghast at the thought of retouching: it is so difficult, such fine work, so much beyond an amateur, and all that sort of thing! but, kind reader, it is nothing of the kind. Don't let anything you may have read or heard deter or frighten you from undertaking retouching. It is the professional's sheet anchor; without a retoucher he is nothing; and the sooner an amateur learns to retouch his negatives of all kinds the better for himself.

Later on I may have something to say on retouching, but meantime I wish to state that it is not a difficult operation, or one outside the capabilities of any intelligent worker.

Having, therefore, got all the negatives of a suitable size, throw off from each a print of as nearly as possible the same depth and tone.

The next step is to make a suitable mask to contain the entire lot in one group. This is also an easy operation, when the proper method is adopted for carrying it out. Still, I have known it puzzle many an old worker how to set about it.

A good sheet of writing-paper is not a very uncommon article to be found in most households, neither is a finely pointed penknife, and most, and, indeed, nearly every amateur is possessed of a set of diaphragm stops—at least, they used to be in the days before the "Iris" fad came into operation. Take, therefore, the largest stop you have, and if you have not got one yourself borrow one from some chum that has, or, better still, get an optician to turn you out of a piece of brass a circular aperture of suitable size. Lay this flat on the sheet of writing-paper, and proceed with the penknife to cut neatly out the circle inside the diaphragm, then carefully, by means of ruled lines and equal distances, lay the diaphragm down and cut out the desired number of apertures. These may assume the shape or form of diamonds, or squares, or any other desired shape. Having cut out this mask, damp it and paste it on to a sheet of clean glass, and when dry you are all ready to mount the photographs over the apertures. In this some little taste should be exercised so as to have the various heads looking in the proper directions: those to the left ought to face to the right, those to the right facing to the left.

In some cases, where it is desired that extra prominence be shown to some especial individual, a larger aperture may be made in the centre, and, of course, a corresponding allowance for the size of the head that is to occupy such a position.

Having tastefully arranged the various heads over these apertures, the entire group is then again placed in a printing frame, and the whole photographed together on one plate. The negative thus obtained is then retouched or modelled up, so as to throw off a uniform print. Such is one of the best means of combining in one picture faces that can only be gathered from varying sources.

I have referred to the advantages an amateur will derive from a knowledge of retouching. There is also another very necessary manipulation, frequently of great service in the byeways of photography. I refer to blocking out. Such enters largely into the everyday practice of all-round photography, and a proper understanding how to get about it will materially assist a keen worker.

First and foremost, a good retouching desk and a powerful pair of spectacles are a necessity. Then a good camel's-hair brush and a supply of moist Indian ink, prepared as I stated in a previous article.

There are many phases in photography in which blocking out becomes an absolute necessity, such as machinery, and other similar work; the copying of the hundred-and-one articles to be found in commerce in which it is desired to remove some objectionable background or eyesore.

In the case of machinery, we are face to face with straight lines, sometimes of long dimensions, in combination with curves and other varying shapes or outlines. The blocking out of such requires an unlimited amount of patience, and no one should sit down to attempt such work in a hurry. It is just about the most trying of all work that falls to an operator or retoucher's lot.

Some clever workers advocate the use of a pen and ruler to goround the lines, but I have never done such good work with a pen as I have with the brush. I do not say, however, that others cannot. I merely say how I have obtained the best results, and it has been as follows:—I invariable use a long-pointed camel's-hair brush of large size; one that will carry a good body of colour. With this I carefully go along the straight lines, keeping as nearly as possible to the outline. Should I, however, slightly overlap, I don't fret or worry about it: I just let the tares and the wheat grow together till the whole is done, then I set aside to dry, and, when thoroughly so, I place the negative on the desk again, and with the aid of a flat ruler and a blunt needle (a large darning-needle, set in a wooden handle) I lightly go over the parts

that are overlapped. The needle will be observed to trim up in a marvellous manner the entire work, and everything will appear true and sharp to outline. Small curves are dressed up by the needle by the hand, and all interstices, no matter how small, come in for a touch up of the needle, which invariably improves them.

I always use Indian ink on the film side, and, of course, varnish previously to applying the ink.

Pinholes, if small, are best touched out with a hard pencil, but this comes under the head of retouching. T. N. ARMSTRONG.

JOTTINGS.

I AM glad to observe that Mr. W. E. Debenham in defending the Photographic Society of Great Britain from the ungrateful attacks of Mr. H. P. Robinson, has plainly and unmistakably indicated the true cause of the latter's present hostility to the best friend (except one) he ever had. The case is in a nutshell. Mr. Robinson's long-threatened reign of privilege was terminated for ever last September, and now he is giving way to the vulgar passion of revenge. Mr. Robinson says I am hoaxing your readers in lifting the corner of the curtain which hides the details of the projected new Exhibition from the vulgar gaze, but he and I know better, unless the idea of such an Exhibition has been abandoned from lack of promised support. Another and a final question. If Mr. H. P. Robinson holds the Photographic Society of Great Britain and its exhibition in such supreme contempt as he wishes us to believe, why has he lately been to so much pain and labour in the endeavour, personally and by circular, to dissuade people from sending in pictures to the Exhibition just about to open? I (and others) pause for a reply.

I observe that one of the advantages of the new platinotype paper is stated to be that the delicate tones—presumably the half-tones—do not "fix out" much. Why should they fix out at all, since metallic platinum is insoluble in water or in the highly diluted bath of hydrochloric acid employed for clearing purposes? The loss must be imaginary and not real, as in the case of the assumed loss of density in the fixation of negatives. By the way, I find the mottling occasionally met with in the new paper can be obviated by slightly warming the oxalate solution, which also prevents the shadows acquiring a slight rustiness occasionally seen.

Is a clearing bath necessary for normal pyro-ammonia development? I think not, as under such conditions the slight yellowing which supervenes is not worth notice. The correspondent "Film Fiend," who in the JOURNAL of August 26 complains of yellowness seems to me to have a needlessly complicated system of avoiding discolouration which not improbably causes it. He first rinses the developed plate under the tap (a few minutes' soaking is much more efficacious); next alums it (which with most modern plates is not at all required), then fixes, washes, clears the yellowing in alum and hydrochloric acid, and finally rinses. The discolouration appears in the course of a few months. I think, if he would omit the first alum bath and substitute a soaking or washing for the final rinsing, the yellowing would not trouble him.

I demur to Mr. William Goode's proposition in the same number, that "perfect sunshine" is essential to success with snap-shot work. Sunshine is probably the one thing more than another which induces under-exposure in this kind of work. I think your correspondent will find that the most harmonious effects are more easily produced in a softer light than perfect sunshine is usually understood to be, with as much exposure as one can afford to give. In perfect sunshine it requires a very careful exposure to avoid hard negatives.

COSMOS.

THE ALL-ROUND HAND.

IT is a common thing at the present time to hear almost awe-struck comments upon the enormous progress of photography and photographers; and yet, granting that the progress be great, it cannot be claimed that the percentage of good work and good workers is equal to that of the times when photographers were few and their difficulties many. Considering the enormous increase in their numbers, the greater perfection of scientific instruments, the increased facilities for working, and the smoothing away of innumerable difficulties, it cannot be claimed that in the aggregate photographers have advanced proportionately with their art. The middle and lower-class ranks are filled almost to overflowing, and yearly approach more nearly to suffocation, while it is only "on the top" that room, fresh air, and a generally healthy situation can be obtained. The starting-point for success now is "on the top," for the climber, lost in the struggle of side issues, rarely reaches that point of advantage. Having surmounted the chief obstacles of science and art, he is confronted by a range of mountains called commerce, upon the highest summit of which sit a select few, basking in golden sunlight.

Without, however, inquiring minutely into the cause of the failure of the many and success only of the few, it may be said that the all-round hand, or handy man, is the natural product evolved by these circumstances. In the struggle for existence, these chameleon-like qualities of his were invaluable in tiding over a crisis in any department. He sprang up, a host in himself, to administer to a blind economy, and the way his order has grown, and continues to grow, may be taken as a sure sign of the times. "Wanted, an all-round hand," "Wanted, a man to be generally useful," "Wanted, one who can do anything and everything," "Wanted, an impossibility,"—these phrases are synonymous, and yet are still wants, attempts being still made, presumably, to supply them. It may be that photographers with wants, knowing the hopeful earnestness with which the average assistant views his own capabilities, advertise for much that they may at least ensure a little; and, generally speaking, the latter in its most meagre sense is what they secure. How, upon the face of it, can the result be otherwise? Dilettantism and dabbling never reach beyond mediocrity, though, in exceptional cases, an assistant may do many things fairly, or even well. To do a thing well and be content may be the summit of a modest ambition, but lacks the true elements of success—real earnestness to excel. Versatility was the demand by writers of a few years back, and right gallantly has their cry been answered. It is to be hoped that a louder cry for concentration will be raised when the extent of the evil becomes apparent.

"Prevention is better than cure," and therefore to aim to check the growth of an evil would be a surer means of eradicating it than by experimenting with the evil itself. The coming assistant represents the coming photographer; will an alteration in the system of his training have a beneficial result? Mr. Howard Farmer, in his paper read at the Convention, advocates this course, and suggests a remedy in the supplementary and intermediate training of scientific and technical schools. It cannot be denied that the present system of training by apprenticeship is an essential one, as much that is learnt thereby could never be taught in the schools. For instance, how else than by the old system of apprenticeship should an assistant learn the necessary tact and utilisation of circumstance in the treatment of the sitter? How else should he learn to produce work surrounded by restrictions and limitations as to time and material? Needless to say, without this knowledge, and that of many similar circumstances, he would be useless in a business. A photographer and his business are governed by circumstances, surrounded and bound down by circumstance, and no amount of scientific theory will train a man to cope with this fact; so many points are clear upon paper to the theorist that would not be recognised by him, or would have no application in the daily practical life. Given teachers whose life had been passed in a photographic business, there would still be lacking the practical demonstration upon *all* points—nay, more, there would be the impossibility of training him with, and according to, the period; for a man to go *with* the times must be *of* the times, as teacher and as student. No, the commercial training is emphatically essential, and the schools would therefore present an additional training only, the result, in effect, being a deeper and wider theoretical knowledge—or, in other words, a better-educated assistant.

It has been said quite recently that many practical assistants, excelling in particular branches of work, are too illiterate to be placed in positions of trust. This means, then, that the main choice rests between the practical boor, the educated duffer, or the mediocre all-round man, for these represent the bulk. Will the principle of technical education affect the bulk? Well, the illiterate man will become a thing of the past, certainly; but, then, the Board schools have already ensured that in part. The educated duffer may become a little less of the duffer; but surely, if a man be a duffer in spite of education, it were better to allow him be unmistakably so than to give him a false ring by technical training, and set him loose upon a profession in which brains are essential. As for the all-round man, why give him more of the quality from which he is suffering? His

knowledge is too wide already, for no detail escapes the grasp of his powerful mind. He is gorged to repletion with a photographic knowledge that would be found useful should there be any great need of *teachers* in the technical schools. His training has not been at the expense of physique, but has helped to produce a kind of gymnastic Dr. Jekyll and Mr. Hyde. One moment you see him printing in the back yard, and in the next you find him effecting a sale or securing an order for an enlargement in the reception room. Upon ascending to the studio, you disturb his genial efforts to petrify a baby into the correct photographic expression; and upon retiring to the work room he is discovered exercising his artistic skill in retouching or producing an enlargement in oils. He pervades the premises bodily, and the subtle influence of his skill and mental attainments is observable throughout the work. He carries a magician's wand that cheapens everything it touches, cheapens with the touch of mediocrity. Let him loose in a business of deservedly good name and standing, give him plenty of scope for his energy, and in a few years you shall wonder why Messrs. So-and-So have reduced their prices, and are seeking premises at a lower rental.

Will you give the all-round hand (who rank in numbers now above any other class of assistants), will you give him the advantage of a better general education? He does not need it. He recognises what it is to work well, and he tries to do it. He has ability enough, but the ability that should be devoted to one or two branches at the most is divided amongst many. From the all-round ranks come excellent managers, employers, and business men; but the position and excellence of photography depends upon the oft-sneered-at specialist. It is he who carries his work to the highest pitch of excellence, and it is to him that we look for advancement artistically, scientifically, and socially.

"Small profits and quick returns"—a maxim that never was and never will be suitable to photography—was the cry that summoned the all-round hand. An employer in a commercial crisis thought he should gain by reducing prices, and thereby securing more custom. The harm lay not so much in the reduction of prices, but in the continuation of the quality of work after the reduction. Men of the same status became frightened, and followed suit, bringing after them the natural train of events—reduced staff, reduced pay, and, in the end, poor work. A snowball does not become an avalanche without assistance. Who was to blame? The public, of course. The public demanded cheapness, and the public would take no denial. Much language has been used at the expense of a blockhead public; but, strange to say, the public have acquired an instinct quite opposed to blockheadedness, an instinct that easily determines between good and bad work. Employers, in their blindness, secured a transitory existence by cutting prices, and, when the inevitable reflection came upon them, and failure stared them in the face, rushed to their papers and periodicals, and wrote down the public. Are *you* an employer of labour? If so, you should know that the public will have the *best* you can give them at the lowest price *you will consent* to state. Good work never goes a-begging, but carries the approval of the public with it. If photographers had emulated their brethren in their work, instead of in the lowness of their prices, many would be in a better position at the present time. There is a manhole above that admits you to light, air, comfort, and success, for "there is always room on the top." The way is through excellence, which is irreconcilable with cheapness, through higher, not lower, prices, through specialism, not dilettantism and mediocrity. The upper road to greater excellence takes the public with it, merits a blessing, and is the surest way to secure it; while the opposite course generally meets with its deserts —not exactly a blessing.

The commercial question in photography seems to be too little studied. It is studied by the individual, of course, but only in the form of self-interest. One would think that, in looking backward to the greater prosperity of former years, photographers would recognise that the best way to study self-interest lies in the *trade* interest. Unity in a trade is the keynote to success, in ruling, and not in being ruled by, the buyer. To study the interest of a trade that finds one daily bread is but fair, and it to be hoped that, when photographers have recognised this, they will start an ardent crusade in favour of specialism, and lay the bogey they themselves have raised in the form of the all-round hand.

H. Colebrook.

PHOTOGRAPHY AND METEOROLOGY.

At the meeting of the British Association at Edinburgh, the Mathematical Section received the second report of the Committee, consisting of Mr. G. J. Symons (Chairman), Professor R. Meldola, Mr. J. Hopkinson, and Mr. A. W. Clayden (Secretary), appointed to consider the application of photography to the elucidation of meteorological phenomena, drawn up by the Secretary. The following are passages from the report:—

Your Committee report that the work has been continued during the past year along the lines laid down in the report for 1891.

Considerable additions have been made to the number of observers from whom assistance may be expected, in spite of the removal of several names from last year's list.

The total number of photographs received up to July 23 was 361, representing a variety of phenomena, but chiefly illustrating the results obtainable in cloud photography by various methods. This number, however, does not adequately represent the progress made, for many other photographs have been promised, and will in all probability be received in a few weeks.

The adoption by the majority of the International Meteorological Congress at Munich of the classification of clouds, proposed by Messrs. Hildebrandson and Abercromby, suggested to your Committee that it would be well to adopt it also, at least provisionally. They cordially agree with the action of the English delegates at the Congress in opposing the acceptance of a system which is entirely empirical; but, since the great majority of foreign meteorologists have determined to employ it, your Committee consider that they should adopt it provisionally. They consider it will be well to follow the example set by other countries until the further study of cloud forms, and their relation to one another, renders it possible to make a more scientific code.

Arrangements have therefore been made for the cataloguing of the collections of meteorological photographs in the possession of the Royal Meteorological Society, and of the Chairman of your Committee.

Photographs of Lightning.

Very few new photographs have been sent in as yet, but from Mr. J. H. Bateman two of great interest have been received. Following the suggestions in the instructions issued last year, two cameras were employed, the first being stationary, and the second moved rapidly from side to side. The plate exposed in the fixed camera shows four flashes, while the one which was moved shows six. A flash which is single on the fixed plate is resolved into three on the moving plate, showing that the flash did consist of a series of discharges along much the same path. The absence of reduplication in the others points to the conclusion that they were single. Two of these single flashes occupy exactly the same relative positions on the two plates, showing that they must have been simultaneous.

Your Committee regret that there should have been no opportunity of carrying out any further experiments upon the phenomena presented by lightning photographs. However, recent discoveries concerning high-tension discharges ought to elucidate the subject. Thus it seems highly probable that the hazy continuous luminosity shown by many photographs may be due to the flame of burning nitrogen.

Before leaving the subject of lightning, it may be pointed out that in Mr. Bateman's photographs the narrow-ribbon structure in each flash is no more pronounced in the moving photograph than in the one which was stationary.

The Royal Meteorological Society has received several new photographs of lightning. They all show the narrow-ribbon structure; one shows reduplication of the images of some chimneys, as well as the flash, while another shows a bright flash and several dark ones. Of this last, Mr. Robert Law, who took the negative at Melbourne, remarks that there were two flashes, the second reversing the image of the first.

Methods of Cloud Photography.

The information at the disposal of your Committee does not, as yet, seem sufficient to enable them to pronounce definitely in favour of any one method as the best. They have made some progress in ascertaining the methods adopted abroad, and also in experimental work at home. The subject divides itself naturally into two sections, dealing respectively with cumulus or heavy clouds, and cirrus or other light clouds.

Cumulus.—With all heavy clouds it is certain that admirable results may be obtained with a little practice in adjusting the stop and length of exposure. So far as the quality of the results obtainable is concerned, there does not seem to be any manifest advantage in the use of a coloured screen, of a black mirror, of specially slow, or of orthochromatic plates. Nevertheless, it is quite certain that results of a given excellence are more easily obtained on a slow plate with a strong developer considerably restrained. It is equally certain that the use of the coloured screen or of the black mirror renders the process easier still.

With correct exposure and careful development, it should not be necessary to resort to intensification of the image. If some such treatment should be required, inexperienced observers should be warned that

in the use of mercurial formulæ it is well to keep the plate in constant movement while in the mercury bath, in order to avoid undue granulation of the image.

Cirrus.—Those who have made a special study of the photography of thin clouds appear to be agreed that, in order to bring out all the details of their structure, some special device must be adopted.

By extremely nice adjustment of the exposure and subsequent intensification of the image, very fair results can be sometimes obtained; but the process is difficult and only practicable in experienced hands.

Dr. Rizgenbach, who first described the black-mirror device, recommends that exposure should be so arranged that the sky leaves practically no impression on the plate, while the thin image of the cloud must be brought out by means of Schlippe's salt (sulphantimoniate of soda).

M. Angot, in a report presented to the Meteorological Society of France, remarks that a black mirror is only advantageous when the cloud is about 90° from the sun. In theory this is of course correct, but the secretary to your Committee has found that there is a manifest practical advantage in its use for all parts of the sky, including even the immediate neighbourhood of the sun itself. M. Angot then goes on to say: The best results are obtained by coloured screens, yet the ordinary screens are insufficient. The following formula, due to M. Léon Vidal, gives every satisfaction. In a small glass trough with parallel faces there is placed a solution made with the proportions—

Sulphate of copper	175 grammes.
Bichromate of potash	17 ,,
Sulphuric acid	2 c.c.

These are dissolved in 100 to 500 cubic centimetres of water, according to the thickness of the trough and the results to be obtained. The sulphate of copper arrests the red rays, and the bichromate the blue and violet. The plates used were Lumière's orthochromatic, and the exposure from ·5 to ·8 second.

Your Committee regret that they have not yet received any illustrations of the results obtainable by the above means, but it is hoped that an exhaustive trial of the method may be carried out in the course of the coming year.

The Secretary to your Committee has continued the comparative trial of slow and ordinary plates with or without a black mirror. He reports that ordinary plates and direct exposure may often give satisfactory results when the background of sky is a clear deep blue. If, however, it is at all hazy, the correct exposure becomes extremely difficult. With slow plates, however, such as Mawson & Swan's transparency plates or photo-mechanical plates, it is fairly easy to obtain results of high excellence.

With the black mirror ordinary plates give excellent results; but here again, unless the clouds are moving with unusual rapidity, or unless the light is very bad, there is a great advantage in the use of slow plates. It is, indeed, easy to obtain a fairly dense image of any cloud, however luminous and however thin, by the combined use of mirror and slow plate. Such means give abundant detail and full gradation of light and shade, even when the sun is actually in the field of view. Exposure would vary from about ·2 to about ·8 second with an aperture *f*·11.

The developer used in all these experiments is the familiar formula with pyrogallol and sulphite of soda considerably restrained.

Special attention should be drawn to the admirable series of cloud studies presented to the Committee, which were taken by Signor Mannucci at the Vatican Observatory under the direction of Padre Denza, S.J. These show what can be done by direct exposure, Signor Mannucci recommending a slow plate for the more difficult subjects. The pictures taken by the Secretary to your Committee in a similar manner show the value of the slow plate and black mirrors.

Miscellaneous Photographs.

With regard to miscellaneous photographs of meteorological interest, your Committee regard with some satisfaction the number of pictures they have been able to secure which show the violence and severity with which the great blizzard of March, 1891, visited the south-west of England. They believe it is of great importance that fairly complete pictorial records should be kept of all such abnormal events.

They are also pleased to be able to report that several of the photographic periodicals have recently manifested considerable interest in the work, one paper having just offered a series of prizes for the best meteorological studies, the editor having offered to present any competing pictures to your Committee. Several photographic societies are also taking the matter up, and your Committee hope that the effect of such powerful aid may rapidly make itself felt, both by increasing their collection and by adding to the number of contributors.

In order to show the widespread interest already taken in the subject, the catalogues of the three principal collections are appended.

In conclusion, your Committee ask to be reappointed with a grant of 15*l.*, in order to follow up properly what they regard as a satisfactory start.

THE FIRST APPLICATION OF BROMINE.

The successful demonstration of Daguerre's process by Joseph Saxton, says Mr. Julius F. Sachse in the *American Journal of Photography*, together with the subsequent experiments by Robert Cornelius, has excited a widespread interest in the scientific circles of Philadelphia. Among the scientists who thus became interested in the new process was Dr. Paul Beck Goddard, assistant to the professor of chemistry in the University of Pennsylvania, who then resided or had an office on the east side of Ninth-street, opposite the University.

Dr. Goddard at once opened communication with Mr. Cornelius, examining the apparatus, and investigating carefully the manipulations as practised thus far by the latter. These visits ended by a duplicate apparatus being made for the use of Dr. Goddard, who entered into a series of chemical experiments, in which it is stated that he had the assistance of the celebrated chemist, Professor Robert Hare.

It will be noted that thus far all the results shown by Saxton and Cornelius had been obtained by the use of dry iodine as a coating for the plates.

In the previous chapter it has been stated that the first two portraits ever made by the daguerreotype process were made by Cornelius—the first of himself, the other of his children, which is also still in existence. The honour of making the third portrait belongs to Dr. Goddard. This was also made in the open air in the rear of his residence on Ninth-street, by the use of dry iodine. The subject or sitter was a student in the medical department of the University—Aaron D. Chaloner. An interesting account of this sitting was given the writer by an old physician still living, who was present on this occasion, fifty-three years ago, while a student at the University of Pennsylvania.

The subject, Chaloner, was seated upon a chair in the bright sunlight, with the injunction not to move, but he became restless before even the preliminary operations, such as focussing, were completed. Dr. Goddard, fearing that the attempt might result in failure, obtained from Dr. Hare's laboratory in the University opposite a blue reflector of some kind, and after the focussing was completed, a blue reflection was thrown upon Chaloner by an assistant, in such a manner as to neutralise the direct rays of the sun. The exposure, it is stated, was prolonged to about three minutes, and resulted in a fair picture.

The First Instantaneous Pictures.

The investigations and chemical experiments of Dr. Goddard were mainly confined to chlorine, bromine, and iodine, and he was not long in discovering that bromine, combined with iodine on the plate, would reduce the time of exposure from one-third to one-half within doors* while in his yard, in the open air, the impression was almost instantaneous. These experiments resulted in the production of a perfect specimen by the use of bromine in December, 1839, which was subsequently shown at the American Philosophical Society (*Proc.*, vol. iii., p. 180).

This is the first record of the employment of bromine in the photographic process. It was during this series of experiments with bromine that Dr. Goddard succeeded in obtaining several good views and portraits instantaneously in the open air, which were the *first instantaneous pictures made by any heliographic process in the world.*

The application and use of bromine as an accelerator was kept a close secret by Goddard and Cornelius for about two years. It was this use of bromine, together with Cornelius's superior skill in polishing his plates, which account for the great beauty of his early daguerreotype miniatures. There is still in existence a plate,† unfortunately in a very dilapidated condition, which it is claimed was one of Goddard's earliest bromide efforts. It represents two male figures in a *négligé* attitude, one leaning back in a chair, the other against a fence. The picture was, without a doubt, made in the open air.

It has been stated to the writer by several old persons who knew Dr. Goddard well at that time, that for a short time he also made for pay Daguerreotype miniatures at his residence in Ninth-street. His appointment as demonstrator of anatomy in the University of Pennsylvania, in the year 1841, diverted his attention from professional portraiture. He, however, did not relax his interest in the new art.

* The laboratory of Dr. Goddard was lighted by a skylight.
† Now in possession of the writer.

In the latter part of the year 1841, a young man, an assistant to Cornelius, was approached and tampered with by parties from New York, who had opened a Daguerreotype gallery there. This individual succumbed to the temptation of the offers made to him, and secretly left Cornelius and worked for two weeks in New York, divulging the whole secret of the use of bromine as an accelerator. As soon as this fact became known, Dr. Goddard at once published the discovery, and the process became public property, and soon came into general use. At a subsequent stated meeting of the American Philosophical Society, held January 21, 1842, Dr. Goddard presented specimens of photographic portraits made by the diffused light of a room, and by the peculiar process in which bibromide of iodine is used. This process he described, and stated that he had ascertained, only on that day, that a similar method had been presented to the French Academy, which, however, in some particulars, was inferior to his own. (*Proc. Philo. Soc.*, vol. ii. p. 144). On the 4th of March following, Dr. Goddard exhibited, before the same society, specimens of daguerreotypes on a surface of gilded silver, and stated that the surface of iodide of gold was more susceptible to the Daguerreotype action of light than that of the iodide of silver, that the surface of the plate might be polished without injury before the action of the iodine, and that the lights came out better than on the silver surface (*Proc. A. P. S.*, vol. ii. p. 150).

In English and Continental text-books upon photography, the claim for priority in the use of bromine as an accelerating agent is usually accorded to one John Goddard, a London optician. That this is clearly an error is apparent from the above indisputable record. The honour for the first use of bromine as a sure and valuable accelerator and the subsequent application to Daguerreotype and photography, without a shadow of doubt belongs to Dr. Paul Beck Goddard, of Philadelphia.

Paul Beck Goddard, a native of Philadelphia, was born in the year 1809, gradnated in the medical department of the University of Pennsylvania in 1832, appointed Demonstrator of Anatomy for the same institution in 1841, a position which he resigned in 1847, when called to the chair of Anatomy of Franklin Medical College, which he filled until 1852. In 1847 he was appointed Surgeon to the First City Troop—Philadelphia's crack military organization. From 1859 to '63, Dr. Goddard was connected with the Philadelphia Board of Health, from 1863 to 1865 he served as surgeon in the U. S. Volunteer Service. He died July 5, 1866.

It is further a noteworthy fact that, while Philadelphia scientists laboured to shorten the time of exposure by chemical means, confining themselves exclusively to the Daguerrean apparatus, which time has proven to be the only practical method, experimenters in New York attempted to achieve the same object by the use of mechanical inventions and such chimerical apparatus as a reflecting camera, and other equally impracticable devices, which were all abandoned as soon as Goddard's Philadelphia process had been surreptitiously obtained.

The First Snap-shot.

Among early experimenters in heliography whose names should not be forgotten, is that of Dr. Joseph E. Parker, who lived No. 61, North 7th-street, then a fashionable quarter of the city. Dr. Parker was a dentist by profession, an active member of the Franklin Institute, and one of the first experimenters to use the Daguerre process for outdoor views, street scenes, &c. He was also one of the pioneers in micro-photography. It is more than probable that Dr. Parker was let into the secret of the use of bromine at an early day, as it would have been impossible to obtain the instantaneous views by the use of dry iodine.

A heliograph (daguerreotype) upon a silvered plate 6 × 5 inches, made by Dr. Parker in the month of March, 1840, is now in possession of the Historical Society of Pennsylvania. It represents Race-street Wharf at the Delaware, and, after the lapse of more than half a century, is still (except where mechanically injured) in a perfect condition, and in definition equal to many of the amateur efforts of the present day.

A series of these views by Dr. Parker were exhibited in the "Departments of Fine Arts" at the Franklin Institution Exhibition held during October 1840. These specimens naturally attracted much attention, and were greatly admired for their beauty and fidelity to nature. The only question which arose to their detriment was the as yet unknown factor of permanency. The committee on premiums awarded Dr. Parker a *certificate* of *honourable mention* for his exhibit.

How long Dr. Parker remained a disciple of the daguerrean art the writer has been unable to determine, nor does there seem to be any record of any specimens from him at any subsequent exhibitions.

DOES VERSATILITY PAY?

From the tone of the discussion which has followed Mr. Howard Farmer's paper read at the Convention, it is plain to see that photographers are not quite satisfied with the present acquirements of their assistants; in short, there is a demand we are told for "all-round men." On the whole, the demand is a reasonable one. The editor has been called to account for suggesting that many branches of photography are to be learned in a comparatively short space of time; but the editor was well within the mark, for, given a young man of average intelligence, he should be able in two years or less to operate, retouch a little, print in various methods, enlarge, and copy. Much more than this is to be learned of photography in two years by older persons; but for the youth enough is as good as a feast, and "sufficient unto the day is the photography thereof."

Salaries do not run very high in the trade nowadays, and why? On account of the numbers engaged in and conversant with photography—the ease with which certain primary knowledge is attained. A retoucher who, five years ago, would ask and receive a salary of 3*l.* weekly could now be had for two-thirds of that sum, and would not expect to be called on to do more than retouch, and operate occasionally. This is where an error has crept in; specialism has been too rampant. On the other hand, men may be none the better off for knowing the Alpha and Omega of photography. As an instance, I mention the case of a gentleman I am acquainted with—a chemist, qualified, and receiving pay from 150*l.* to 180*l.* yearly. He took up, as the expression is, as a hobby, the fascinating art. He became, in two years, an expert photographer—wet-plate and dry, all the known printing processes, enlarging, photo-mechanical and micrographic work. The certificates of the City and Guilds Institute were evidence to his theoretical knowledge, and a frame of medals bore testimony to a general excellence of manipulation. As is often the way in such cases, my friend was the recipient of much advice; all his *drug* friends advised him to go in for photography entirely, and all his *photographic* friends recommended him to stay where he was. However, receiving an offer from a good firm, from pure love of the art the plunge was made; but it proved to be an error—it was the other extreme. My friend was the all-round man; he could operate anywhere and everywhere, retouch, print, enlarge, copy, make slides, instruct the pupils, keep the books, and look after the residues. He was "at home" in all departments. As might have been expected, he got much "kudos," but little coin—never quite so much as the gentleman styled "the head retoucher," and who could (and would not if he could) do little else. This seemed hardly fair, and my versatile friend drifted once more, and now earns more than ever before at an entirely different profession, studied in spare moments. Talking over this and other matters, he said, and I thought it of importance, that he always missed something, difficult to define, in his photographic education, but which was apparent in others who had served their time (an apprenticeship, in fact) to the profession. Photographers cannot, I am sorry to say, be accused of excessive liberality (and perhaps it is not altogether their own fault) in the matter of salaries, which may account for much. These salaries, to my mind, want, like those in the Church, more equalising; the printer, the man who probably is very often the all-round man of the studio, must not be allowed to starve at the expense of the retoucher. There is a medium between the specialist and the versatile individual who is always a student, and sometimes a professor—the man, in fact, who knows too much for the nineteenth-century studio. The one will get, *pro rata*, well paid, the other never value for his services.

J. Pike.

Our Editorial Table.

The *Idler* for September displays a continued advance in respect of its pictorial contributions upon former numbers. The article on "Boxing with Four Fists," by Mr. Robert Barr, which is partly illustrated from photographs, is a clever exposition of the French system of boxing. The other contents of the magazine are excellent, the pictures being notably well reproduced.

Fitch's Films.

Some recent experiences with these films have very favourably impressed us with their good qualities. Photography with cut films is rendered most agreeable by means of Mr. Fitch's productions. The celluloid supports possess remarkable flatness and purity, and are thus

admirably adapted for the purpose, and the quality of the sensitive coating is uniformly excellent. In the preparation of Fitch's films, great technical skill is evidently displayed.

Richard's Patent Corners.

These are small, gummed, triangular pieces of paper for attaching photographs to mounts, albums, and scrap-books. They should prove useful either temporarily or permanently.

The "Cadett" Plates.

Cadett & Neall, Ashtead, Surrey.

Mr. Jas. Cadett's long experience in the nice art of dry-plate making is a guarantee that any sensitive product emanating from the house of Cadett & Neall is sure to reach the highest level of excellence. We have just submitted a sample of the firm's "Lightning" plates to a practical test, with the most favourable results. Their speed, according to Messrs. Hurter & Driffield's system of measuring the rapidity of plates, is 59°, which, translated into actual results, proved to be a degree of rapidity not excelled by any other plate with which we are acquainted. This high sensitiveness is accompanied by an ease and rapidity of development with a normal solution not always associated with very rapid plates, especially taking into account the fact that the "Lightning" plates yield density with the utmost readiness. Regarded from the point of view of technical properties, the "Lightning" plates are irreproachable.

"The Photographer:" a Monthly Record of Photographic Progress.

Elliott & Son, Barnet.

This is a small four-page pamphlet giving, *inter alia*, interesting reading matter on current photographic topics. It is unfortunate that when Messrs. Elliott issued it they were seemingly unaware that a monthly publication bearing the same title (published by Messrs. G. Mason & Co.), and a copy of which is before us, had already been in existence for several years.

Studies in Photography.

By John Andrews, B.A. London: Hazell, Watson, & Viney, Limited.

In these *Studies* Mr. Andrews devotes a few chapters to the consideration of the claims of photography to rank as an original art. Naturalistic photography he considers an attempt to reproduce the mystery and beauty of nature under poetical aspects, and in accordance with the rules observed by the masters of the art. "A glance at the walls of the photographic exhibitions shows that art ideas and motives are stirring the photographic world; and though no reasonable person imagines that photography will ever equal or supersede brush work, still there is a field, and a wide one, it may profitably occupy." The author in a chapter on "The Artistic Use of a Hand Camera" considers that a hand camera should be used strictly as a hand camera, if the best results are to be obtained. But we know many who do not, except on occasion, use hand cameras except as those of the ordinary kind mounted upon a stand, and claim that in this way only can the *best* results be obtained. There are chapters on the Study of Nature, the Study of Art, on Portraits and on Atmosphere. The book (202 pages) will prove good suggestive reading. It is in the main a collection of articles contributed to the *Photographic Quarterly* and other reviews. It is well printed and contains several illustrations. Price, 3s.

Burton's Photographic Printing.

London: Marion & Co.

This is a second edition, revised and enlarged, of Professor W. K. Burton's *Practical Guide to Photographic and Photo-mechanical Printing Processes*. Some matter which appeared in the first edition has been excised, and new matter introduced instead. The history, theory, and practice of most, if not all, printing processes in actual use are fully dealt with, the information as regards photo-mechanical printing being especially complete and practical. The book, which contains 414 pp. and is well printed, is possibly the most comprehensive guide to all branches of photographic printing extant.

Fallowfield's *Photographic Remembrancer* for August-September summarises and particularises the latest novelties down to the most recent date. Mr. Fallowfield is unexcelled in enterprise.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 15,901.—"An Improved Process for the Transfer of Photographic Images." W. H. Slader and L. Siedle.—*Dated September* 5, 1892.

No. 15,956.—"New or Improved Process and Apparatus for the Tentative Exposure and Development of Pictures obtained by Photography." E. H. Hardy.—*Dated September* 6, 1892.

No. 15,971.—"An Improved Combined Carrier and Dissolver for the Optical Lantern." S. J. Levi & Co.—*Dated September* 6, 1892.

No. 16,012.—"Improvements in and in connexion with Optical Lantern Slides." W. C. Hughes.—*Dated September* 7, 1892.

No. 16,026.—"Improvements in or connected with Jet Apparatus for Lime and other Lights." A. Kershaw.—*Dated September* 7, 1892.

No. 16,074.—"Improvements in Racks Used for Soaking or Drying Photographic Plates." J. Pumphrey.—*Dated September* 8, 1892.

No. 16,196.—"Improvements in Mounts for Photographs and the like, applicable also for Albums." F. M. Bridgwater.—*Dated September* 10, 1892.

No. 16,264.—"An Improvement in the Manufacture of Photograph Albums." Complete Specification. G. Albert.—*Dated September* 10, 1892.

PATENTS COMPLETED.

Improved Apparatus for Printing Lantern Slides from a Photographic or like Negative.

No. 17,098. James Dore, 27, High-street, Sandown, Isle of Wight. *August* 13, 1892.

A frame of wood or other suitable material containing a panel with opening in the centre rather smaller than the transparency plate to be used. In use a negative (photographic or other) is placed at the back of panel, and is kept in position by a diaphragm of wood or other suitable material hinged to the inside of frame and fastened by a spring catch, allowing any part of the negative to be adjusted to the opening in panel. In this diaphragm is an opening exactly opposite that of the panel to receive the sensitised plate. A back or cover of wood or other material, also hinged to and inside frame, fits over the diaphragm, and fastens by turn-buttons of brass or other material. On the inside centre of back is fastened a flexible pad, which keeps the sensitised plate in contact with the negative when the cover is closed.

There are no loose parts, and any number of duplicates can be made from the same negative without readjustment.

Improvements in Camera Obscuras.

No. 19,597. John Richard Fielding, Roach House, 2, Grosvenor-road, Douglas, Isle of Man.—*August* 13, 1892.

Hitherto it has been customary to have only one reflector, lens, and table, on to which table the picture is shown in camera obscuras, but I propose to have a series of reflectors, lenses, and tables round the room (I prefer about twelve of each, but more or less may be used). By this means the view of the country all round the camera obscura can be shown on the tables at one and the same time. These tables I propose to use on an incline to give a sharpness in the picture for long and short focus, but may be horizontal if required, and each reflector, lens, and table is divided from the others by screens or partitions if required.

The claims are:—1. Having a series of reflectors and lenses which will reflect pictures on a table or tables in the camera obscura. 2. Dividing the pictures on the table or tables from each other by screens or partitions.

Improvements in and connected with Photographic Apparatus for Surveying and Field Sketching Purposes.

No. 14,231. Herbert Weld-Blundell, Wellington Club, Grosvenor-place, London.—*August* 20, 1892.

This invention has for its object to adapt a photographic camera to fulfil the requirements of surveying and field-sketching operations for military and other purposes, and it relates principally to the combination with a hand or other portable camera of means or appliances whereby a record may be easily obtained of the true relative bearings of the station and sighting points, that is to say, of the place at which the camera is situated when a photograph is taken and of any distant object forming a prominent feature in the picture.

For this purpose, the screen upon which the picture is focussed or viewed, is divided and graduated in the manner of a protractor, either by lines upon the glass, or by a skeleton or wire protractor so applied as to be visible upon or through the screen. Upon, or beneath, or otherwise in proximity to the focussing screen a magnetic compass having a transparent card is mounted above the optical axis of the camera, whereby orientation of the picture reflected on the screen, and, consequently, of the landscape or image photographed, is obtained.

Within the camera a fine index wire is mounted perpendicular to the base of the picture, and parallel to the sensitive plate, another wire moving with the first being so arranged with regard to the view-finder or focussing screen as to cause its shadow to be projected thereon, so that, upon this index being made to coincide with the position with regard to the vertical centre line of the picture of the image of any sighting object therein, there will be produced upon the resulting negative a fine vertical line corresponding to the image of the sighting object to serve as a datum line from which to construct the resulting chart.

Within the camera another index, parallel and close to the plane of the negative, so as to cause its shadow to be projected thereon, is so mounted as to be adjustable to any angle through an entire circle, and is operated by gearing connected with an external index, which is set by reference to the magnetic

compass, and works over a correspondingly graduated disc in order to produce upon the negative a graphic record of the orientation or bearing of the camera when the photograph was taken.

Upon the side of the hood of the focussing or view-finder screen a clinometer may be mounted to enable the elevation or depression of the camera at the moment when the photograph was taken to be ascertained. This instrument may be detachable, and marked with *radii, formulæ*, measurements, and other indications used in working out calculations.

For accurate observations with a prismatic compass provision may be made for mounting this instrument upon the camera directly above the optical axis thereof.

Improvements in Apparatus for Producing Enlarged Copies of Photographs.

No. 15,282. Edgar Clifton, 108, Regent-street, London, Middlesex. *August* 20, 1892.

An improved photographic enlarging apparatus, consisting of a baseboard of sufficient length, which may be of wood, metal, or other suitable material, and divided into two or more sections, attached to each other by means of hinges, pivots, or other suitable contrivance, so as to permit of its being easily folded. Upon the centre division I erect a stage or frame, for the purpose of carrying the condensing lenses as generally used; in this frame, in front of the condensing lens, is an aperture or recese to carry the negative to be enlarged, which may be placed in without any other fitting, or, preferably, in the special frame or carrier hereinafter described. In front of this, again, I attach a camera body of the ordinary form, and of suitable dimensions; this may be constructed either of wooden boxes sliding in each other, or may be made of wooden frames at each end, attached to each other by means of a folding bellows of leather, indiarubber, cloth, paper, or other suitable material, the front portion of this camera body being made to slide out upon the front section of the baseboard when in use. Focussing may be effected by a rack and pinion, screw, lever, slide, or any method in common use by photographers. To the back part of the frame, carrying the condenser, I attach a sliding body, which may be made of metal, asbestos, millboard, or other suitable material, so arranged as to allow the posterior portion to be approached to, or withdrawn from, the back surface of the condensing lens by sliding upon the rear section of the baseboard without permitting the egress or admission of light, except through an aperture in the end. For greater security I prefer to furnish the front portion with au inner lining, between which and the outer cover the back portion is allowed to slide.

To the aperture at the back of the sliding box I attach a lamp, gas burner, or other suitable source of light, such lamp being protected and covered by a metal chimney or sheath, so that no light can escape except in one place, which is placed opposite the aperture in the back of the lautern body while the apparatus is in use. When not in use the lamp and its chimney or sheath are to packed inside the sliding body of the lantern, which is made of such form and dimensions as will permit of containing it when closed, such body being fitted with suitable springs or fastenings so as to hold the lamp and its sheath, chimney, or cover firmly in position, thereby preventing injury when travelling. Another part of my invention relates to an improved frame or carrier for holding photographic plates in the aforesaid or other photographic enlarging apparatus.

I make two frames of wood, metal, *papier mâché*, or other suitable material, having an opening in each of the size of the plate or portion of plate from which it is desired to enlarge. These two frames are hinged together along one edge, and are provided with a suitable clasp or fastening, so that they shut and clasp in the same way as a book. The inner surface of one of the frames may, if desired, be faced with cloth, and the inner surface of the other is fitted with a number of cushions, pads, or suckers of indiarubber, leather, or other elastic material, arranged round the opening so that the photographic plate may be held firmly in any position when laid thereon, and the frames closed and clamped. Or I may substitute a continuous strip of rubber or leather, placed round the aperture in the carrier in the place of the separate pads or suckers aforesaid. The carrier or frame is preferably made larger than the plate for which it is designed, to allow of adjustment in a lateral or vertical direction.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
September 19 ...	Dundee Amateur	Asso. Stndio, Nethergate, Dundee.
„ 19 ...	Hastings and St. Leonards	
„ 19 ...	Leeds (Technical)	Mechanics' Institute, Leeds.
„ 19 ...	South London	Hanover Hall, Hanover-park, S.E.
„ 20 ...	North London	Wellington Hall, Islington, N.
„ 20 ...	Oxford Photo. Society	Society's Rooms, 136, High-street.
„ 20 ...	Southport	Shaftesbury-buildings, Eastbank-st.
„ 21 ...	Brechin (Annual)	14, St. Mary-street, Brechin.
„ 21 ...	Bury	Temperance Hall, Bury.
„ 21 ...	Hyde	
„ 21 ...	Manchester Camera Club	Victoria Hotel, Manchester.
„ 21 ...	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
„ 21 ...	Portsmouth	Y.M.C.A.-buildings, Landport.
„ 21 ...	Southsea	
„ 21 ...	West Surrey	St. Mark's Schools, Battersea-rise.
„ 22 ...	Birmingham	Lecture Room, Midland Institute.
„ 22 ...	Hackney	Morley Hall, Triangle, Hackney.
„ 22 ...	Ireland	Rooms, 15, Dawson-street, Dublin.
„ 22 ...	London and Provincial	Champion Hotel, 15, Aldersgate-st.
„ 22 ...	Oldham	The Lyceum, Union-street, Oldham.
„ 23 ...	Cardiff	
„ 23 ...	Holborn	
„ 23 ...	Maidstone	"The Palace." Maidstone.
„ 23 ...	Richmond	Greyhound Hotel, Richmond.
23 ...	West London	Chiswick School of Art, Chiswick.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

September 8.—Mr. A. Haddon in the chair.

The Chairman presented a copy of the *Argentic Gelatino-Bromide Workers' Guide*, by J. Burgess, published by Morgan & Kidd, about the year 1880, and drew attention to the fact that it contained the germ of the "Developan" which was recently introduced.

Mr. C. G. Norton exhibited his non-photographic lens tester for testing the flatness of field of a lantern objective. This consists of a piece of muslin mounted between plain glasses. For use, the tester is placed in the lantern stage and focussed on the screen, when the centre and sides of the image may be compared for flatness. He also showed his registering templates, for securing exact coincidence of discs when using a biunial or triple lantern, which can also be used to ascertain whether two or more lenses are of the same focus, and to test whether a lens is rectilinear. They are made by a mechanical process which ensures two or more being absolutely identical, the glass being fixed in its place previous to the lines being drawn upon it. He also showed an adjustable runner for lantern stages, to raise or lower the slide at one or both ends to the extent of three-sixteenths of an inch, which is ample for the purpose.

Mr. E. W. Parfitt exhibited Messrs. Newman & Guardia's new shutter, made in aluminium, which admitted of pneumatic regulation of the exposure from the fiftieth of a second down to one second; and also the same firm's changing back, applicable to an ordinary camera, which permitted of any particular plate from a number being used.

Mr. B. Foulkes Winks, in reference to the new developer, amidol, exhibited a negative developed therewith, and said he found a difficulty in getting density, although prolonging development for ten minutes, and using five drops of a ten per cent. solution of bromide of potassium.

Mr. T. E. Freshwater observed that he had recently set his little boy to develop two or three plates with amidol, and the negatives turned out nice and dense.

"The Stop in a Single Lens."

The following question from the box was read: "How is the proper position of the stop in a single lens ascertained?"

Mr. W. E. Debenham said it was impossible to say if there was a proper position. When Grubb issued his single lens many years ago, he arranged for an adjustable stop, so that as the stop was nearer the lens it would cover a wider field, while further off the field would be flatter. It was wrong if the stop was in such a position so that one got flare. Generally speaking, the further from the lens the flatter the field. In architectural work, the further the stop was from the lens, the more one got the particular distortion which belonged to single lenses. It was better to use a very small stop near the lens.

The Chairman said it was recommended in certain books to fix the stop at a distance of one-fifth of the focal length of the lens.

"Development when Travelling."

Another question was: "What is the best method of treating developed plates when travelling, so that fixing may be postponed until after the return home?"

The Chairman thought it best to wash and dry the plate. If it were then exposed to light, it would be very little injured. He did not think light would affect its printing qualities.

Mr. Debenham doubted whether the plates could be washed enough to prevent light affecting them. Some plates showed red in the shadows on being exposed to light, while others remained unaffected.

Mr. A. Cowan would always prefer to fix where possible.

Mr. W. H. Harrison observed that Mr. England's plan was to wash a little of the hypo out, and to well wash the plate when he came home.

Mr. Debenham said that this might do for photographers who were well up in it, but for those who were not the negative might be ruined by turning yellow.

Mr. Foulkes Winks found that on washing negatives which had already been dried and washed, there was a tendency of the film to flow off the glass.

"Is there any Adequate Theory of Reversal?"

Mr. T. Bolas said that in the collodion days there was a notion that the red rays retarded the action of light on the plate, one wet-plate operator saying that there was so much red light in his room that it neutralised any white light which gained admission. He suggested that the experiment as to whether red light prevented white light acting on a sensitive surface might be tried with a biunial lantern at a future meeting.

Mr. J. S. Teape detailed his experiments as given at previous meetings, proving by a series of gradnated exposnres that no re-reversal took place.

Mr. Debenham said that in his experiments he could not change the point of reversal by any variation of the developer. He found that the time necessary to reverse was about 4,000,000 times necessary to produce the merest trace of a developable image.

The Chairman, in reference to the time of development of reversed images, suggested that possibly the liberation of bromine tanned the film in parts, and that if the developer were given long enough to act on those parts it might produce an image. Mr. Wellington had tried to get reversal on a collodio-bromide plate and could not. By passing a solution of chlorine gas through a solution of gelatine, the latter was made insoluble in water, and something of the sort was most probably the case with bromine.

Mr. Harrison said it was a curious thing that negatives might be produced by reversal on some plates and not on others. A photo-mechanical printer in the south of London always used this method for obtaining reversed negatives.

After further discussion on this subject the meeting adjourned.

North London Photographic Society.—September 6, 1892, Rev. E. Healy in the chair.—This meeting, the first after the summer vacation, was devoted to reports of holiday work, and a good number of specimens of hand-camera work, as well as of larger sizes, occupied the attention of the members. It was noticeable that a considerable proportion had been taken on isochromatic plates, the results fairly showing the advantages of the colour correction.

Almost without exception the prints were on Ilford or Eastman printing-out paper, toned under various conditions of bath, but in all cases with satisfactory results. Messrs. Beck's Bynoe printing frame was shown, and attracted a good deal of interest, and the new developer, amidol, was mentioned as to be reported on very shortly. Next meeting September 20, when a practical demonstration of retouching will be given by Mr. Redmond Barrett.

North Middlesex Photographic Society.—September 12, Mr. H. Smith in the chair.—Thirty-five members and a number of visitors were present. Mr. Beadle addressed the Society on *Lantern-slide Making*. He showed a frame for the purpose of printing by contact from any part of a half-plate negative, made from a whole-plate printing frame. The ordinary back was removed, and two thin boards substituted; the inner sides were covered with a soft material, and a square hole, 3½×3½, cut in the centre of each. The negative was sandwiched between them, leaving the selected part visible through the opening, the whole arrangement being clamped together with the pressure springs. The lantern plate was dropped into the opening over the negative, and secured in place by a lid, fastened with one pressure spring. Mr. Beadle referred to the various lantern plates on the market, their peculiarities, and the tones to be obtained on them. He had long wished for a print-out plate, and had tried, with success, the following formula, which he had recently seen:—No. 1, Silver nitrate, ½ ounce; citric acid, 60 grains; water, 1 ounce. No. 2, Nelson's No. 1 gelatine, ½ ounce; water, 6 ounces. No. 3, Alum, 20 grains; Rochelle salts, 20 grains; ammonium chloride, 10 grains; water, one ounce. No. 2 was gently warmed, and No. 3 added; No. 1 was then added, drop by drop, with constant stirring, heated to 150 degrees, and filtered through two thicknesses of muslin, and the plates coated by pouring a pool in the centre, and flowing all over. The only trouble he had met with was that it remained slightly tacky, and would stain unvarnished negatives. Lantern slides, large transparencies, and opal plates, produced by this method, were passed round for examination. The colours obtained by toning with the borax and cyanide baths were very fine, and, though the plates had been repeatedly removed during printing for examination, no signs of doubled images were visible, as in replacing the plate care was taken to bring it into close contact with the same side and end of the printing frame. The lecturer then dealt with the minutiæ of exposure, development, and toning of slides made by gaslight, and ended by making one or two slides of great beauty. A hearty vote of thanks was accorded to Mr. Beadle for the seasonable lecture he had given. The competition of views taken at Welwyn and Hadley was held, Mr. Allpress being declared the winner. The next meeting will be held on Monday, September 26, Mr. Mummery in the chair, when Mr. E. J. Wall will lecture on the *Life of a Dry Plate*. Visitors welcome.

Hackney Photographic Society.—September 6, Mr. A. Barker in the chair.—Several members complained of the inaccurate manner in which meetings had been reported during the absence of the hon. secretary, and in consequence the minutes of the preceding meeting were ordered to be rewritten. Mr. S. J. Beckett, of 6, The Grove, Hackney, was nominated for membership, proposed by Mr. Sodeau, and seconded by Mr. Hensler. Donations:—A cabinet portrait of Mr. Harverson, taken by himself for the album, and six blue glasses for testing dark-room lights, from Mr. Sodeau. Work was shown by Messrs. S. Beckett, Harverson, Hudson, Nunn, and Sodeau. Mr. Nunn showed the result of testing a ruby lamp with an Ilford red-label plate; it was pronounced safe. Mr. Hudson showed a negative and lantern slide developed with amidol. He was much pleased with this new developer, and had developed eight plates in succession with one portion of developer. Mr. Beckett did not think that amidol would be very suitable in cases of over-exposure, but thought that it would prove excellent in cases of under-exposure, and for lantern slides, &c. Mr. Hudson had found that some sulphite of soda, which had been exposed to air, did not completely dissolve in water, and did not prevent stain to the same degree as the fresh substance. Mr. Sodeau said that this was due to its having been oxidised to sulphate. Mr. Gosling asked whether sulphite of soda and meta-bisulphate of potash would keep in solution. It was stated that they would keep if air be excluded; solutions of sulphite of soda should be acidified. A member had developed a lantern plate with pyro and sulphite of soda only; it was remarked that sulphite of soda is alkaline. A member asked whether pyro-soda could be used for developing more than once. Several members did so, but others thought that it was not advisable, especially in cases of under-exposure. Mr. Capell asked what effect citrate of soda had in developing. It was stated that it was very useful in cases of over-exposure, as it allowed the negative to gain in density, while preventing detail from coming out.

Richmond Camera Club.—September 9, the President in the chair.—Referring to the soda developer mentioned in the minutes, the Chairman remarked that, for some kinds of plates, the amount of soda should be halved. For time exposures it was advisable to begin with even less than that amount. Mr. Faulkner inquired which was the best method, to obtain density first and detail after, as he had seen lately recommended, or *vice versâ*. He preferred getting the detail first of all; with rodinal, he had been unable to obtain vigorous negatives. Mr. Ramsay had had no trouble on that score. Mr. Ennis could get better density with pyro-soda than with rodinal. Mr. Davis wished to know why, in a recent article, carbonate of soda was recommended as the alkali for hydroquinone instead of the usual hydrate. Mr. Faulkner said that, development being slower, a finer grain and a better negative would be the result. The discussion having turned on fixing, Mr. Cembrano expressed the belief that fading of silver prints was often due to insufficient fixation. For negative work, a dirty hypo bath was often the cause of stained or yellow negatives. Mr. J. D. Gibson said that climatic conditions also affected the permanency of albumen prints. Photographs which he had made in Madras, where the climate was dry and hot, had faded, while others, done at the same time and under the same conditions, which he had sent to England, had stood the test of time well. His experience of the climate in Ceylon, which was damp and hot, was that it also caused prints to fade. He added that want of permanency was due as much to unsuitable mounts and mountants as to insufficient washing out of the hypo. A member having asked whether prints on gelatino-chloride paper required as much washing as albumen prints, Mr. Ardaseer replied that the former required more, the paper being thicker and the hypo penetrating more into the gelatine. The discussion fixed for the evening on *Improving Faulty Negatives* was opened by the Chairman, who said that there were a number of ways of improving faulty negatives, but that, whenever possible, he recommended taking another one. Covering the back of the plate with collodion, containing some aniline dye, such as aurine, was an excellent plan, whose parts covering the over-dense spots of the negative could be scraped away. Mineral, or tissue paper was also often used in a similar manner; by means of a stump and blacklead used on them, the light could be retarded on some parts of the plate. Sometimes a negative could be greatly improved, especially if a very flat and thin one, by making a transparency from it, and from this a negative; by suitable exposure and development, the contrast could be very much increased. Intensifying the negative was often resorted to by some workers, while others preferred getting great density by development, and then using a reducing agent. For platinotype, Mr. Willis had found that, printing under signal-green glass, the quality of the resulting print was much altered; it was eminently suitable for hard negatives, as printing under iris glass gave much softer images. He (the Chairman), had obtained a piece of signal-green glass, but the colour appeared to him to be a peacock blue by daylight. Mr. Ardaseer said that was so, but by gas or oil light the colour would show as green; if examined in the spectroscope, it will be found to transmit nearly no other rays but the green. The Chairman then announced that the winter session of the Club would begin on October 10, and that the nights of the meetings would be altered to Mondays, at eight o'clock, the chair being taken at half-past eight p.m. This change had been found necessary in order to secure the use of a larger room, the present one being inadequate, owing to the increased number of members.

South London Photographic Society.—September 3, Mr. Maurice Howell (Vice-President), in the chair.—The President (Mr. F. W. Edwards) read a paper on the *Life and Works of George Tinworth*, the famous terra-cotta sculptor, illustrated by a fine collection of forty lantern slides, which was much appreciated by the members and friends (150) present. Many requests for the repetition of the lecture have already been received by the President, who has consented to do so, and to increase the number of illustrations to sixty. It was announced that the judging of the prints from negatives on Paget plates was deferred until the next meeting.

Tooting Camera Club.—September 8, Lantern night.—Slides of English, Scottish, and Continental views were exhibited by means of the President's new limelight lantern to a large number of members and friends. The Paget Prize Plate Company kindly sent a framed enlargement of instantaneous pictures, taken on their plates, for the Club-room; also sample packets of their plates, which were distributed to the members for trial.

Croydon Microscoptcal and Natural History Club (Photographic Section).—September 9, Mr. Carter in the chair.—In addressing the meeting, the CHAIRMAN said they were brought together that evening to discuss and receive the opinions and ideas from the members as to the arranging of the coming winter session. Mr. E. Lovett, the President of the Club, who was present but unable to take the chair owing to other business calling him away, intimated to the members that the Institution Committee had made them an offer of their committee-room, to be converted into a dark room and meeting-room, in the place of the dark room they now had, and which could not be used on account of being so damp. The idea was well received by those present, and Mr. GOODE proposed, and Mr. WALLER seconded: "That it was the opinion of the Photographic Section of the Club that it would be a great boon if the committee-room could be hired for the purpose of a dark room, to be always available for the use of members." The CHAIRMAN then said that that proposition would be placed before the General Committee of the Club on Wednesday next, to receive their consideration. Mr. Carter then called attention to a new question box which the Club now had, and hoped the members would avail themselves of it. Suggestions were then received from the members present for the coming winter meetings, and will be considered and arranged in due course by the Photographic Sub-Committee.

Chorley Polytechnic Photographic Society.—In connexion with the Polytechnic recently established in this town, a camera club has been formed, and will be known by the name of the Chorley Polytechnic Photographic Society. The premises, which are at present undergoing extensive alterations, are conveniently situated in Fellery-street, almost in the centre of the town, and it is expected that the dark room will be ready for use in the course of a few days. At the meeting held on Wednesday, September 7, the following gentlemen were appointed officers:—*President:* Mr. J. T. Brierley.—*Vice-Presidents:* Messrs. H. R. Dorning, R. Berry, and W. Dornan.—*Treasurer:* Mr. R. Gill.—*Secretaries:* Messrs. Jas. G. Welch and Wm. Wareing. Judging from the attendance, and the number of members who have enrolled themselves at the various preliminary meetings, we have little hesitation in saying that there is every prospect of this becoming a most successful organization. Any one interested, and desirous of becoming a member, is invited to send his name to either of the Secretaries, from whom all particulars may be obtained.

Derby Photographic Society.—The above Society had one of their very enjoyable outings on Saturday last, September 10, going to Melbourne, which, with its quaint old church and picturesque lake, offered good opportunities for camera work. Through the courtesy of Mr. Fane, his extensive grounds, laid out in the Dutch style, with ancient yew-tree hedges, were opened to the Society. The light being excellent, some good views were obtained, and the return journey was made in the early evening. The Society had as a guest Miss Catherine Weed Barnes, of New York, who has also been entertained by Messrs. Keene and Scotton, who accompanied her to Haddon Hall, Matlock Bath, and Wingfield Manor, and a number of exposures were made. These excursions have been much enjoyed, and it is to be regretted that they are so nearly at an end.

Lewes Photographic Society.—The annual meeting of this Society was held at the Fitzroy Library on Tuesday evening, September 6, under the presidency of Mr. Tunks. Mr. BEDFORD, the Hon. Secretary, read the following report:—"There are at present forty members on the books; nine new ones have been elected during the year, and seven have resigned. Ten ordinary meetings have been held during the year, and have been fairly well attended. The excursions have been so badly attended that it is contemplated to discontinue them unless

they receive better support. The Treasurer's report shows a balance in hand of 1*l.* 8*s.* 4*d.* It is with much regret that the Council have to mention the loss the Society has suffered by the resignation of Mr. J. G. Braden, who has held the position of President since the formation of the Society, he having left the town; also their regret at the loss of so energetic and useful a member as Mr. Percy Morris, who has likewise left the town, but they are pleased to know that both these gentlemen will continue as members of the Society. Finally, the Council wish to thank the Press, local and otherwise, for their kind notices of meetings, excursions, &c., and for kindly sending copies of their papers." The report was adopted, and Mr. Tunks was unanimously elected President. Mr. Wightman was appointed Vice-President. Mr. Constable was elected Hon. Secretary in the place of Mr. Bedford, who resigned the office, having found it impossible to give the amount of time required to carry out the duties; and Messrs. Funnell, Young, Carpenter, Bedford, and Curtis were elected on the Council. A vote of thanks was passed to the Paget Prize Plate Company for a framed enlargement of snap-shot pictures taken on their plates, and for sample packets of plates sent by them for trial, which were distributed to the members present, who promised to report on them at a subsequent meeting. A new style of printing frame, the Bynoe, sent by R. & J. Beck, was shown, and generally considered to be a decided advance in printing frames. All communications for the Society should now be addressed to the Secretary, Mr. H. B. Constable, 5, East-street, Lewes.

Manchester Photographic Society.—September 8, Mr. A. Brothers occupied the chair.—Mr. W. H. Farrow (Hon. Secretary) showed Beck's Bynoe printing frame; a very compact and apparently efficient improvement on the old wood frame. Mr. Alan Garnett introduced a novelty he had obtained recently in Paris. This was a substitute for the lime cylinder, to be used for the oxyhydrogen light. It was composed of a preparation of magnesium, in the form of a small disc (about the size of a sixpence); a platinum pin in the edge enabled it to be fixed in a suitable holder on the ordinary lime pin. Mr. Garnett stated he used it with a blow-through jet; with a mixed jet it did not give as good a light, the reason of which he could not explain. When the light was once adjusted, no further attention was required, and the disc was unaffected by the ordinary atmospheric moisture when not in use, qualities which were of great advantage over limes. As far as Mr. Garnett could at present tell, the substitute was fairly durable, and each disc would last a considerable time. A rough trial was made in the lantern with the new disc against lime, a blow-through jet being used, and, as well as could be judged, the lights were equal, some being inclined to award the new light superiority in purity. Mr. Garnett had with him one of Steward's latest jets, fitted with every requisite adjustment by screws or racks, and also with a bye-pass cut off tap to the blow-through jet—a very valuable addition, especially when used in conjunction with the lime substitutes for enlarging, or when the full light was only required at intervals. Messrs. Blakeley and Evans were elected Auditors of the past year's accounts. The Hon. Secretary announced that the Photographic Society of Great Britain had reserved the evening of October 19, during their annual exhibition, for a display of lantern slides by the members of the Manchester Society, and requested members to send in slides, so that a good selection could be made for that purpose. Mr. Smith, of the Eastman Company, was present during the evening in a private capacity, and he contributed much to the interest of the meeting by showing a collection of holiday snap-shots.

Rotherham Photographic Society.—Tuesday, September 6, Dr. F. B. J. Baldwin (President) in the chair.—One new member was elected. The Bynoe printing frame was introduced. The arrangement for holding the paper was much approved, but the question was asked as to the risk of the print moving in the larger sizes. Information had been received relative to the Hill-Norris collodion plate, which had made its appearance during the month. Particulars of several photographic specialities were laid before the members. The fourth excursion of the season was arranged to take place on Friday, September 16. The destination is Wingfield Manor, Derbyshire. The remainder of the evening was taken up in a profitable consideration of "questions," of which there were a considerable number. One member desired information as to the yellowing of one of the chloride of silver emulsion papers, and it was thought that, in the process of toning, the addition of fresh gold to an almost exhausted bath might have brought about the degradation.

Sheffield Photographic Society.—September 6, Mr. E. J. Chesterman in the chair.—The new rules of the Photographic Exchange were brought forward and thoroughly discussed, and satisfactorily arranged, when fifteen members gave in their names to join. The Secretary laid upon the table for inspection a new printing frame by Beck & Co., and Mr. Crowder showed a neat contrivance to act as printing frame in case of emergency. Several members gave very good reports of the Paget Prize Plates handed round at the last meeting, showing negatives and prints from same. The date for the receipt of pictures for the annual competitions was postponed until November 14. Mr. E. Beck opened the discussion on *Instantaneous Photography*, which induced a deal of valuable information.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

PHOTOGRAPHY BY RULE.

To the EDITOR.

SIR,—In my letter published in your issue of the 9th inst., I inadvertently stated that the exposure varied as the focal length of the lens. Obviously I should have said as the *square* of the length.

The word "false-lying" is a printer's error for *falsely;* and likewise the word "instrument" occurs where I have used the plural, *instruments.*

Hoping you will allow these corrections to appear,—I am, yours, &c.,

The Arts Club, Manchester, September, 14, 1892. R. C. PHILLIPS.

To the EDITOR.

SIR,—Mr. Bedding, in his reply to Mr. Phillips on September 2nd, says "that in photography, a little of one's own experience conveys much more instruction than a great deal of another's." But do not all photographic students of necessity have to rely more or less upon others' experience before being able to adventure their own? As Mr. Bedding, in condemning exposure tables and actinometers, &c., advises the beginner in photography to ignore other peoples' experience, should he not logically extend the same advice to them as regards the composition of developers, developing, printing and toning, &c.?—I am, yours, &c.,

London, September 8, 1892. W. MORRIS.

Mr. Bedding's reply to the above, and to Mr. Phillips's letter appearing in the JOURNAL of last week, is as follows:—

"Apparently Mr. Phillips is not content to place the beliefs of his good men and true (whoever they may be) as to the value of aids to exposure in the scale against the work of the majority of photographers who do not use such aids, as he somewhat lamely says that he cannot gauge the work of this majority because he is not ubiquitous, and they will not show him their failures. This is pretty fencing; but Mr. Phillips should know perfectly well that it is no rejoinder. Trial and error is the system upon which, so far, most of the world's photographs—successes and failures—have been made. What, then? Does Mr. Phillips guarantee an immunity from failure under his 'quantitative element' system? Where are the successes of that 'quantitative element' system? and why is it that, although several weeks have elapsed since the publication of the paper on 'Photography by Rule' in three photographic journals, not one unprejudiced person in the whole of the photographic world has taken the trouble to criticise my contentions? Mr. Phillips says he is unbiassed, and I will accept his assurance; but I believe he was taking photographs for many years before the advent of Messrs. Hurter & Driffield. Now that he has found salvation at Widnes, I should like to know if he is agreeable to inform his brethren through these pages that he has only just recently found out how to properly expose a plate?

"I perceive that, in attacking the constancy of the factors considered in exposure calculations, I have failed to convey my precise meaning to Mr. Phillips, the fault of which I admit is chiefly my own. Let it, however, be true that the principles of the instruments assume the variability of the factors with which they deal, will Mr. Phillips tell us what kind of result we are to expect from varying a series of uncertainties? Do gelatine plates increase or decrease in sensitiveness by keeping? Or are they unaffected in that respect? Under what system of exposure calculations is the actinic power of the light accurately expressed? Again, as to Nos. three and four of the principles of the instrument Mr. Phillips defended (and which, by the way, I have not yet attacked), is the area of aperture of the diaphragm in relation to focus always correctly rendered? and, moreover, are all lenses of equal aperture and equal foci on an equality of rapidity? In short, are the values of these factors so accurately known at the time of exposure as to assure a proximately correct exposure? and if the knowledge to be gained by correctly rendered factors is only of approximate value, of what use is it when all or any of the factors are erroneously estimated? Surely, under the latter conditions, I am justified in doubting if the knowledge is likely to be of real assistance, while as under the most favourable circumstances Mr. Phillips admits it to be only an approximation, the quantitative element would not appear to take one any nearer the attainment of correct exposure than the method of trial and error.

"Until there is some ground for alleging that a man who fails to master exposure by trial and error will find his difficulties removed by adopting aids to exposure, I consider Mr. Phillips's inference as going too far. What would be the use of the youth who had failed with his own brains adopting aids which Mr. Phillips concedes only give approximate results? I always thought that in exposure accuracy was a desideratum, but according to Mr. Phillips's method it is not obtainable. Why then advise one who is incapable of succeeding with trial and error to take up a method which still leaves the door open to error? As to Mr. Phillips's challenge, may I ask him to define the circumstances under which a photographer is likely to be working with plates 'of whose speed he has no idea.' Personally, I am quite content with trade speed descriptions of plates as a guide, and so are most, if not all, photographers, I believe. In his first letter Mr. Phillips says that he has observed an operator of long experience and judgment demand trial plates and rectify his error on the second or third trial, while the novice requires a dozen or more. Quite so; but, when the novice has emerged from his novitiate a trial plate will suffice. Mr. Phillips makes me say that it is not advisable to know the speed of the plate one is working with, but to *look at the focussing screen* and find out by trial and error. It is a pity that Mr. Phillips's admiration for Messrs. Hurter & Driffield's work should be responsible for such distortions of an opponent's views as this. I said nothing of the sort.

"Mr. W. K. Burton's article as to the value of exposure tables, from which Mr. Phillips quotes, was, it seems, written ten years ago, and yet in all that time we have only got so far as 'approximate' results. This is hardly comforting for the students 'who,' Mr. Phillips says, 'have better times in store than their predecessors have had, if they will but make intelligent use of their experience.' They do not appear to have

profited much by the exposure tables of the last ten years or so, otherwise why were Mr. Phillips's letters written? That gentleman asks me if I have tried to discover whether the authors of exposure tables and instruments are practical photographers? On Mr. Phillips's assumption that they are, what is still more extraordinary to find is, that any advocate of these tables and instruments should be a practical professional photographer.

"I think Mr. Morris will find his letter answered in the course of the above reply to Mr. Phillips."

THE DECAY OF PROFESSIONAL PHOTOGRAPHY.

To the EDITOR.

SIR,—I have read all the correspondence in your JOURNAL on your leader of August 5 on the "supposed" decay of professional photography, and, seeing that you have published some letters from professionals in the cities, I thought you would like to know what some of us smaller men—country professionals—think of your article.

Well, Sir, we think your statements are very much exaggerated. You say that the professional "puts out" nearly all his work, but I reply that we country photographers don't do our business in that way. For myself, I have been in business for twenty-two years in the same town, and my business is growing larger every year. I have worked the collodion process for years, and when dry plates came in I made my own, and did not buy any for six or seven years. I also worked the Lambertype, chromotype, platinotype, and other methods of printing; have made some of my own enlargements; this is the only process in my business that has been partially "put out." I have had apprentices serve for five or six years each, and can name some of them that are turning out photographs, to put it mild, not inferior to most of your city photographers. Now, Sir, I am not saying this to boast, but we do think your article is a libel on the professional photographers, and that has made it necessary to contradict your statements in order to defend ourselves. As far as a large number of country photographers are concerned, and I have made a great many acquaintances during my twenty-two years amongst them, I could not think of one where your article would apply. No, Mr. Editor, *you must recant.*

Again, how is it that all the good photography is not found in London and other large cities, where all the advantages of scientific training can be taken advantage of? I don't think, Sir, you would be bold enough to say that the average of first-class photographers is greater in London than elsewhere. If that is the case, I must have been unfortunate in coming across a goodly number of second-rate ones when I visited the great city. But, Sir, please don't think that we depreciate any opportunities of improvement. We wish we had some of them to help, but certainly not to replace the years of apprenticeship.

One more question: If the amateurs are making such headway and photography learnt without apprenticeship, how is it we do not see more of their work that would be fit to put on the market for sale? I see a good deal, but very seldom any that would stand the test of being offered to the public in the ordinary way. Perhaps there may be one in the 10,000, as in A. Lévy's letter of August 26.—I am, yours, &c.,

September 10, 1892. A COUNTRY PROFESSIONAL.

THE NEW DEVELOPER.

To the EDITOR.

SIR,—Upon reading your remarks upon my last letter I communicated with Mr. Hauff at Feuerbach, the manufacturer of amidol and metol, and find from his reply that, whereas metol is to be had everywhere in Germany, amidol alone has been placed on the English market, but for trade reasons is not sold here—the reverse being the case with metol.

He has, however, supplied me with some amidol, and on trying it I have found your remarks on it in your leading article fully justified. It develops clean and thoroughly all the different brands of plates which I have hitherto had time to try, including Eastman's films—but, beyond being a single-solution developer, has no advantage over metol, if indeed that be an advantage.

It has, however, one drawback—especially for a lady—that it stains the fingers dark brown, much the same as pyro silver in developing a collodion plate—and I confess I like keeping my hands tidy if possible. When working wet collodion I wear white kid gloves that have been used at evening parties, and which have become easy from wear, with, of course, the long arm parts cut off; but I think at best they are awkward, and I should prefer a developer such as metol, which does not stain.

The maker of amidol, in writing to me, especially recommends it to be used as follows, particularly for travellers:—

Water	2 ounces.
Sulphite soda	48 grains.

This solution can be made up in quantity anywhere, and keeps perfectly. When required for developing add to the above quantity of solution five to six grains of amidol, which, to save weighing, can be sufficiently accurately measured by means of a small horn spoon. It will dissolve readily, and develop five or six plates in quick succession, which, after being slightly rinsed in clean water, are fixed in the acid fixer—four parts hypo to one part bisulphite.

No alum bath is necessary; I generally use the fixing cartridges, consisting of the two salts mixed, and sold at a cheap rate. Two of these dissolved in twelve ounces of water give an acid fixing bath which will last a long time, and remain limpid till quite exhausted.

Darmstadt, September 10, 1892. ETHEL CONSTANCE MAY.

CYANIDE OF POTASSIUM.

To the EDITOR.

SIR,—In your issue of September 9 you refer to a paper read by Dr. Kayser upon the above substance, in which he states that the "so-called potassium cyanide of commerce usually contains a very large proportion of sodium cyanide." We have been manufacturers of cyanide of potassium for thirty years, and are, we believe, by far the largest makers in this country, but our product is, and always has been, quite free from cyanide of sodium. We only supply cyanide of sodium, and cyanide of potassium and sodium, when specially asked for.—We are, yours, &c.,

JOHNSON & SONS.

23, *Cross-street, Finsbury, London, E.C., September* 13, 1892.

THE "FRENA" HAND CAMERA.

To the EDITOR.

SIR,—We shall deem ourselves greatly favoured if you will kindly announce in your next issue that we have been appointed by Messrs. Beck, special West End agents for the sale of their new "Frena" camera and films, and that we hold a very large stock of both ready for immediate delivery. It may also interest your amateur readers to know that we give practical demonstrations to purchasers, which naturally tends to ensure their success.—We are, yours, &c.,

Pro THE LONDON STEREOSCOPIC AND PHOTOGRAPHIC COMPANY, LIMITED,
London, September 9, 1892. BUTLER HUMPHREYS.

PHOTOGRAPHY AND THE ILLUSTRATED PRESS.

To the EDITOR.

SIR,—You have several times used strong terms respecting those who pass off other person's work as their own.

In the *Illustrated News* of August 27 is a full-page reproduction of a photograph entitled *Cool Waters*, described as being by Morgan & Co., Bournemouth. The original negative was taken by myself in 1886, and an enlargement, 24 × 18, was, as some of your readers may remember, in the Photographic Society's Exhibition in Pall Mall in that year, and it was also shown at Dundee, where it took the silver medal (highest award).

Morgan & Co., as successors of the firm of which in 1886 I was a partner, have a right to publish the photograph, but not to describe it as being by themselves.—I am, yours, &c., HENRY WHITFIELD.

1, *Bellevue, Clifton, September* 12, 1892.

A SOCIETY FOR FOREST GATE.

To the EDITOR.

SIR,—In reply to the query appearing in your last issue as to a Society for Forest Gate and Stratford, we are quite close to this district, and have a good number of members residing there. Our roll of members counts ninety, which speaks well for the success of the Society. Our subscription is five shillings per annum. Our winter season commences in October. Informal meetings are held every Saturday evening this month at eight o'clock, and we shall be pleased to see Mr. Wilton or any other gentleman wishing to join a good society.—I am, yours, &c.,

ALBERT E. BAILEY, *Joint Hon. Sec.*

Rosebank, Southwest-road, Leytonstone.

Exchange Column.

Will exchange 12 × 10 burnisher, oscillating bar, for good portrait lens of ten-inch focus, or more.—Address, J. HORTON, Central Studio, Caroline-street, Cardiff.

Will exchange fireplace accessory (by Seavey), in good condition, for good small rectangular table, preferably double-ended.—Address, J. T. GENTNEY, 6, South-parade, Huddersfield.

Exchange microscope (cost 45*l.*) for screw-cutting lathe to value of about 15*l.*; also 5 × 4 No. 4 regular Kodak, for gentleman's gold lever watch and chain.—Address, A. VALENTINE, 30, Danbury-street, London, N.

Enlarging lantern, with eight-inch condenser, and portrait lens oil lamp, all complete, costing 13*l.*; will exchange for one of Watson's new Premier portrait lenses, costing 9*l.* Address, GIBBS & Co., Middlesbrough.

Exchange for a hand camera or a quarter-plate rapid rectilinear lens, THE BRITISH JOURNAL OF PHOTOGRAPHY from July, 1883, to December, 1885; the year 1889; 1890 from February; 1891 complete; and 1892 up to August; also the first fifteen numbers of the *Magic Lantern Journal*, except Nos. 3 and 7.—Address, J. GRIMSHAW, 16, Dale-street, Haslingden.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & CO.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

H. J. Davis, Penrith.—*Church Parade of the Royal Westmoreland and Cumberland Yeomanry Cavalry*, 1892. *Eden Hall troop of Royal Westmoreland and Cumberland Yeomanry Cavalry at Grestoke Castle, May*, 1892.

G. DAINGER.—We should be happy to consider the matter if you will send us the articles. You did not enclose your address.

C. EGERTON.—The work you name can probably be seen in the Free Library of the Patent Office, Southampton-buildings, W.C.

A. HORTON.—Having arranged the lens to its best advantage, take it to a competent optical brass-turner and state your requirements.

W. A. C.—1. Caramel, if used as a backing, will obviate halation. 2. The plates you name may be obtained already orthochromatised.

S. H.—The spots appear as if due to either floating particles of matter on the surface of the bath, or settling on the paper while the surface was still moist.

D. T. C.—The whole of the specimens sent are fairly good as photographs, but not as pictures. In every case the camera was placed far too near the sitter; hence the unpleasant appearance.

C. WHITE.—1. The first-named lens stopped down is perhaps preferable. 2. Yes, undoubtedly. 3. Yes. 4. The print is probably overtoned. 5. The lighting is all that could be desired.

A. LEVY (Paris).—1. We should be pleased to have your experiences. 2. The appearance of the paper is a sufficient guide. If you have the requisite light surface, it matters but little whether it is obtained by a single or a double operation.

EXPERIMENTALIST.—Gum, dextrine, albumen, and all colloid substances of that character, when treated with bichromate of potash and exposed to light, become insoluble, or non-absorbent of water, in the same manner that gelatine does.

C. MALCOLM.—If by "porcelains" you mean pictures on opal glass, the best and most general way of producing them is by the carbon process, single transfer. Take reversed negatives, and develop the carbon prints direct upon the glass, which, of course, has been perfectly cleaned. No substratum is necessary.

LOUIS (Paris).—The print forwarded is not a photogravure, but a collotype. It is an exceedingly fine specimen of that process. Prints of this kind can be produced at a much lower rate than photogravures, but to produce them of the quality of this one would necessarily cost considerably more than the general run of collotype work.

E. W. WARREN.—Wake's work on *Colouring* was the best published, but is now out of print. It is possible that you may obtain a copy of it by advertising for it, or the volume of THE BRITISH JOURNAL OF PHOTOGRAPHY in which it appeared several years ago. Failing that, we should advise you to get a few lessons from a skilful colourist.

SILVER.—Probably if you had procured the sample of potash we recommended, which may be had at any operative chemist's, you would have succeeded better; but when you speak of edging the plate with putty, we quite perceive that you have no idea of the cleanliness and niceties of the process. If with the right kind of potash you do not succeed, you will find it cheaper to send the glass to a professional silverer.

A. C. (Edinburgh) wishes to know how to produce "negatives on dry plates so that they cannot be distinguished from wet collodion."—We do not know. The plates supplied specially for photo-mechanical work, and slow plates developed with hydroquinone, have very much the character of those by wet collodion. But the best of them would not for a moment be mistaken by any one at all familiar with the collodion process as being produced by that method.

W. MALONY.—There are several different forms of presses employed in collotype printing besides the power machines. The ordinary typographic press is used considerably in this country. So also is the litho press. Special presses are made for collotype work, in some of which the pressure is applied by a roller; in others by means of a scraper, as in the lithographic press. It matters very little how the pressure is obtained so long as it is applied evenly and is under control.

W. HILL says: "Would you let me know, if I took the view of a church or, in fact, any photograph of a personage, and had the print copyrighted, could any other photographer take the church or person without infringing the copyright, or does the copyright just protect the print only?"—In reply: The copyright protects the particular print only that is copyrighted. Anybody else is perfectly at liberty to take the church or the personage from exactly the same standpoint as you did.

T. E. B.—All retouching mediums, the formulæ for which have been published, are more or less affected when the negatives are varnished. This remark applies, though less perhaps, also to commercial ones. The better the medium suits the requirements of the retoucher in his work, the more liable it is to be acted upon after varnishing. As a shilling bottle of the best recognised medium is sufficient for several hundreds of negatives, you will find it more economical to purchase it than experiment in making it for yourself. However, Canada balsam, thinned with turpentine, forms an excellent retouching medium. Other formulæ will be found in back volumes of the JOURNALS and of the ALMANACS.

A. F. M. writes: "I am anxious to take a photograph of a golf club swinging, as I wish to get the true curves. I have tried attaching a flaming fusee to the head of the club, but the flame blows out, owing to the rapidity of the swing. Of course, I do it in the dark, and what I wish is a curve of light on a black background. It has been suggested that I should fasten a globe of polished metal to the club head, and take the photograph in sunlight; but, besides other objections, I think leaving the lens open so long would entail hopeless fog, and I write to ask if you could put me up to any plan by which I could attach a brightly burning or glowing light to the club head without its blowing out. Would luminous paint impress the plate at the speed a club travels, which is very great?"—Luminous paint would be useless; a small electric lamp might serve, but the motion of the club would have to be regulated accordingly.

F. E. G. says: "I thank you for your reply through the JOURNAL with reference to the copying difficulty. However, your remarks do not assist me; I am afraid I did not explain to you clearly where I am in fault. If I wish to make a copy, not necessarily of same size, but approximately, and I plant my camera about six or seven feet from object, in focussing this is what happens: If I adjust the ground glass by moving it forward, I can get the object clearly defined on the ground glass; but if, instead of moving the screen forward, I move the lens back, the object will not become clear. As I move it back it certainly grows a little more into focus, but after passing a certain point it then works out of focus again. If this is so, then I am afraid the same defect will (in a smaller degree) arise in taking groups with such a camera; in fact, I have, before I attempted any copying with it, thought there was not very good definition, and was inclined to blame the lens. I feel sure many of your readers will have experienced the same difficulty, and I would like to know what is the best thing to do, as I cannot afford to throw away the camera and get a new one?"—Your difficulty will vanish if you will realise that in focussing inwards with the lens the object should also be moved.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—October 17, *A Chat about the Eastman Products*, led of by Mr. Arthur C. Baldwin.

THE meetings of the Hackney Photographic Society are now held at 206, Mare-street, Hackney, and not at Morley Hall, as before.

CROYDON CAMERA CLUB.—Special whole-day excursion, Saturday, 17th inst., conducted by the Vice-President, Mr. B. Gay-Wilkinson, to Limpsfield, Pains' Hill, and Hurst Green.

MISS CATHERINE WEED BARNES, of New York, is to address the members of the London and Provincial Photographic Association on September 22 on *Photographic Limits*. Visitors will be welcome.

PHOTOGRAPHIC CLUB.—September 21, *Photographic Fallacies;* at 9, Special General Meeting. 28. *The Object of Photography* (Miss Catherine Weed Barnes). Outing Saturday next, September 17, Kew and Strand-on-the-Green. Meet at Kew Station at half-past two.

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1893.

EDITED BY J. TRAILL TAYLOR.

THE ALMANAC *for* 1893 *is already in course of preparation, and we shall be happy to receive contributions from those who in former years have enriched its pages with the results of their experience and practice in the photographic art. Not less cordially, also, do we invite the newer supporters of* THE BRITISH JOURNAL OF PHOTOGRAPHY *and its* ALMANAC *to include themselves among the contributors to the Annual which for many years past has been highly esteemed for the valuable writings of so many able photographic workers.*

As we were compelled last year to omit several interesting articles from the ALMANAC *on account of the late dates at which they were received, we should be glad if intending contributors would endeavour to send us their articles as early as possible.*

NEW MONTHLY SUPPLEMENT.

IMPORTANT NOTICE.—*With the* JOURNAL *of Friday, October 7 next, and on the first Friday of each succeeding month from October to March inclusive, we shall issue a special gratis supplement, devoted to the interests of the makers and users of the optical lantern, in which every phase of the subject will be treated by the ablest authorities. This step, which has been in contemplation for a considerable period, is necessitated by the increasing popularity of the lantern in its numerous applications, scientific and domestic.*

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1690. Vol. XXXIX.—SEPTEMBER 23, 1892.

As previously announced, we propose, during the months of October, November, December, January, February, and March, issuing with The British Journal of Photography a gratis supplement, devoted to the interests of the makers and users of the optical lantern and its numerous applications. The first supplement will appear with the Journal of Friday, October 7th next.

The growth in utility and popularity of the optical lantern, its increasing importance as an adjunct to amateur photography, its manifold advantages to the photographer, the scientific investigator, the lecturer, and many others, more than justify the institution of a special department of The British Journal of Photography in which the topic in all its phases can be exclusively treated, besides rendering the interests of the many commercial firms now engaged in the manufacture of lanterns and their many accessories so considerable as equally to demand increased facilities for their separate representation.

We shall be happy to receive communications of interest relating to the lantern and its cognates for the pages of the supplement, in which we shall also be glad to notice novelties and improvements in apparatus. In short, it will be our endeavour to deal with the lantern from every standpoint in the most comprehensive manner possible.

ABNORMAL EFFECTS IN LIGHTING.

While writing this, we have on our table a photograph, which might be termed a species of "mystery picture," taken by Lady Gertrude E. Molyneux, of Croxteth. The subject is *The Alps from St. Gervais*, and from memoranda on the back we find that it was taken "by moonlight," with an exposure of nine seconds, the lens, a rapid rectilinear, working at *f*-8, its full aperture. The date on which it was taken was July 3, and the hour was nine o'clock p.m. We have here all the *data* requisite for the investigation of this phenomenal photograph, in which we see the moon itself in the heavens, about two degrees above the mountain ridge in front.

The first noticeable feature on scanning the picture is that several portions, which could not by any possibility have been illuminated by the moon, are shown fairly well lighted, and with some detail, and this at once might be held as disposing of the idea as to any direct lunar influence having been exercised upon the illumination of the subject, for a view taken by moonlight, and showing detail, implies that the moon is elsewhere than directly in front of the camera. Besides, we, and every one who has attempted photography by lunar light alone, know full well the absolute impossibility of obtaining a photograph of a terrestrial scene by an exposure of nine seconds, or, for that matter, of nine minutes, even with a quicker acting lens than that employed on this occasion.

Where, then, is to be found a solution of what some of our good friends in the Midland provinces have been disposed to regard as a mysterious photograph? In our estimation there is no mystery in the matter at all, or difficulty in the solution. It was taken on July 3, at nine o'clock in the evening. Now, moon or no moon, the obtaining of a photograph so very soon after sunset would prove a feat not beset with any difficulty in this country, and still less, we think, would it be so in the high Alpine region, which may be assumed to be 44° north latitude. At nine o'clock in an almost midsummer evening, we have obtained presentable photographs in the latitude of London, where, during a series of several days, and omitting seconds, the sun does not set until nineteen minutes past eight o'clock, the date of the taking of Lady Molyneux's photograph (July 3) represents a difference of little over one minute from this. Hence it is very easy to conceive of the atmosphere being so well illuminated for this brief period after sunset, especially in the vicinity of lofty, snow-clad mountains, as to render photography quite practicable for a time, even after the disappearance of the orb of day.

It may be that in a case such as that just described the mere visual power of the moon, especially when it is a full moon sailing in a clear atmosphere, will, in a measure, cheat the senses into the belief that its luminousness far transcends in actinic energy that of a seemingly feebly lighted sky.

Bearing in mind that the lunar light does not exceed that which would be radiated from a cloud the same angular dimensions of the Queen of the Night, it is also a fact that, under some conditions, the actinic power of the sun itself, even when its rays are thrown direct upon an object, is so feeble as to be quite overpowered by the grey sky.

One of the finest examples of this occurred in our own experience some years ago. It happened, when on a visit to a group of islands situated in 59° north latitude (just beyond the most northerly point of Scotland), that we took occasion to obtain a portrait just before sunset, and when the sun, then in the north-west, was sinking with an *entourage* of crimson clouds. By this, as a dominant light, one side of the sitter was brightly illuminated. The process was wet collodion, the proportion of iodide to bromide in the collodion being about three and a half

to one. On developing the image it was found that the shadow side of the face, that which was lighted from a grey easterly sky, showed a denser deposit than that obtained from the direct solar rays. This was quite easily accounted for by the fact of the setting sun having been shorn of its actinic power in a degree far transcending that of its luminousness.

On mentioning this incident to two friends, one of whom was the late O. G. Rejlander, the latter stated that he had had a precisely similar experience on one occasion, the lights and shadows being reversed.

We have lately carried a cognate of this idea a little further, and applied it to the taking of portraits in a private room, when, as is so frequently the case, the sitter has to be placed at the side of a window, a concomitant of which position is that one side of the face is lighted, the other being deep shadow, except in so far as it is illuminated by the light radiated from the walls of the apartment. On lighting up the dark side by the light obtained by burning a few inches of magnesium ribbon, we found no difficulty in so subordinating the daylight illumination as to effect a reversal, causing the outer, or naturally lighted, side to be the shadow side, the inner side being that from which the dominant light proceeded. The hint here thrown out may be profitably utilised by those who have the leisure and inclination to follow it up.

THE POSITION AND PROSPECTS OF PROFESSIONAL PHOTOGRAPHY.

It is so often the fate of those who, with the best of intentions venture to pass in review the actions, tendencies, or shortcomings of a section of their fellow-men, to be misunderstood, that we shall not complain of not having carried with us the entire number of our professional friends who recently took advantage of the opportunity afforded them by our correspondence columns to discuss the conclusions of our article of August 5, on "The Decay of Professional Photography." In terminating the correspondence, however, we are glad to note that several of them appreciated the motives by which we were inspired on that occasion, and the remainder, we are convinced, would have done so had they, as one correspondent suggested, read what we wrote without bias; for, although our strictures may on first acquaintance have read rather unpleasantly, it is needless, we are sure, to remind our friends that our remarks were conceived in the same spirit which has always animated this Journal in its relations with the profession—that is, one of the warmest solicitude for its well-being.

In describing the system under which very many modern photographers conduct their businesses—that of "putting out" a great deal of their work—we were guided by our own knowledge and experience, which we are hardly disposed, either as regards length of time or of area, to place below that of any of our correspondents; and, of course, we allowed that there were numerous exceptions to the rule. The extent to which retouching, printing, and enlarging, and other departments of practical photography are delegated by the photographer to trade houses who make a speciality of these classes of work, clearly indicates that in such studios the opportunities of a youth for acquiring any knowledge beyond the production of the negative are retarded; but where it is otherwise, and the work is done in the photographer's own establishment, we should be the last to assert that a youth could desire a better field for the study of portrait photography, from the exposure of the plate to the production of the finished print.

Our doubt as to the majority of photographers' studios being conducted on the latter plan is, after all, the chief point at issue between ourselves and one or two of our friends, and we fear that, notwithstanding their individual beliefs and impressions to the contrary, we must adhere to our original proposition, derived, as we have hinted, from no inconsiderable observation and experience. Nobody would be more pleased than ourselves could we have reliable evidence that we were mistaken, inasmuch as it would in a large measure disprove the theory that professional photography is in the depressed condition it is generally supposed to be. One argument more than another seems to us to support our view of the matter, and that is, that if, contrary to our belief, the numerous departments of photography are as a rule executed on a photographer's own premises, the magnitude of the average business far exceeds what it is commonly supposed to be.

The studio photographer is, we believe, more often born than made, and the artistic feeling, the tact, and the other mental qualities necessary to success are, if also ingrained, only cultivated to perfection in the studio, and are neither to be acquired nor developed in the technical schools which so many have recently been advocating. It has, however, never, to our knowledge, been suggested in any proposed scheme of technical instruction that the experience to be gained in a studio could so far be supplied elsewhere; and hence we are agreed with a correspondent as to the importance of a separate study of both. The object of technical instruction is, as we understand it, to impart to the young photographer a knowledge of ancient and modern photographic processes, as to which, in comparison with his Continental *confrère*, most people consider him behindhand. This knowledge cannot be gained in many photographic studios. One of our correspondents states that, if he wants a really useful assistant, he has to train one himself, or procure one from the Continent, which, while conveying a compliment to the foreigner, rather tells against our correspondent's fellow-photographers in this country, and indirectly supports several of our original contentions.

On the whole, while regretting that several of our correspondents should have hastily misinterpreted some of our remarks, we are happy to have elicited a series of useful and instructive letters upon a subject which appears, as we surmised, to be of vital interest to professional photographers. It is a happy augury that those who have taken the strongest objection to our remarks have no reason to be dissatisfied with their share of success, and are, we are pleased to observe, in little need of our advice. Behind them, however, is a far larger class of photographers, for whom our remarks had special reference, for whose behoof and warning they were written, and to whom we commend a study of them, in the hope and belief that they, and professional photography generally, will be thereby ultimately benefited.

THE STANNOTYPE PROCESS FOR LANTERN SLIDES.

The stannotype process, when it was first introduced, was generally looked upon as a formidable rival to Woodburytype, though, as time proved, it did not commercially meet with the success that was anticipated for it. The process formed the subject of a patent, and that was said in some quarters to be the reason why it was received with so little favour. But this is a question we shall not discuss here. The process is really a good one, and for it the inventor, the late Mr. W. B. Woodbury, was awarded the progress medal of the Photographic

Society of Great Britain. Like the Woodburytype, it is equally as applicable for the production of transparencies as it is for paper prints; indeed, all that can be done by one process can be equally as well accomplished with the other, and all are familiar with the great excellence of Woodburytype lantern slides.

Both processes are by the same inventor, and are the same in principle, though they differ somewhat in practice. The Woodburytype may be termed a professional, while the Stannotype may be classed more as an amateur process, inasmuch as the former requires a somewhat costly plant for its working, while for the other nothing more is requisite, particularly for lantern slides than is to be found in the "den" of every amateur. In some respects stannotype has an advantage over Woodburytype, because for the latter process a vigorous negative is essential. With stannotype a tolerably weak negative may be utilised.

In the Woodburytype process the gelatine relief is produced direct from the negative, and, in order to obtain the necessary relief, that must possess a certain degree of vigour. From this relief the printing matrix is made by forcing it into the surface of a thick sheet of lead by hydraulic pressure, the pressure required being from four to five tons per square inch of surface. The prints are obtained by pouring on this mould warm ink which consists of pigmented gelatine, then placing on that a piece of paper or a glass plate, and applying sufficient pressure to distribute and force out the superfluous ink. As soon as the gelatine has set, the impression, which is in reality a cast, is taken off, and, after being dried, is finished. In the stannotype process a gelatine relief forms the actual printing plate, thus dispensing with the hydraulic press, the printing operation being conducted, whether on paper or glass, in precisely the same manner as in the process just referred to. Here is a brief description of the stannotype process in practice.

As the gelatine plate forms the actual printing plate or mould, a little consideration will show that it must be made from a transparency instead of a negative; also that the transparency must be reversed as regards left and right. It matters not how this transparency is produced, so long as it is of a vigorous character. In the case of a reduction from a larger negative, it must, of course, be made in the camera. When it is to be the same size as the negative, it may be made by contact printing. If, however, a dry plate be used, the picture will have to be stripped from the glass to get the necessary reversal. The more general method is—and it was the one usually adopted by Mr. Woodbury—to produce the transparency by the carbon process, developing it on a glass plate, and afterwards intensifying it with permanganate of potash if requisite. In making the transparency, which on the whole is best done by the carbon process, it must be made with a clear margin or "safe edge," by masking, and the extreme high lights must be represented by absolute transparency as clear as the safe edge. In fact, this transparency, whether good or bad, is a counterpart of what the finished print will be.

The tissue for the relief is not, we believe, an article of commerce, though, if a demand were created for it, no doubt it would soon become one. However, its manufacture on a small scale involves no difficulty whatever. There are several methods of making it. Here is one of the most simple:—A glass plate, after being treated with French chalk, is coated with a rather thin enamel collodion, and allowed to dry. It is then placed on a levelling stand, and coated with warm bichromated gelatine. The following is a good formula:—

Nelson's amber gelatine	5 ounces.
Loaf sugar	$1\frac{1}{4}$ „
Glycerine	$\frac{1}{2}$ „
Ammonia	2 drams.
Water	1 pint.

With sufficient Indian ink to confer a slightly brown tint.

When the gelatine is dissolved, and shortly before using, from three-quarters to one ounce, according to the temperature, of powdered bichromate of potash, is added. Sufficient of this mixture is poured on the levelled plate to form a film, when dry, the thickness of a stout visiting card. This, for a 12×10 plate, will take about five ounces. The gelatine quickly sets, when the plate can be removed for drying. As, owing to its thickness, the film in the ordinary way would take a long time to dry, during which period the tissue would be getting more or less insoluble, the plate is placed over a tray of chloride of calcium, which considerably hastens the operation. When dry, the tissue is stripped off, and it is ready for printing.

Before printing, a second safe edge mask, narrower than the first, is fixed on the transparency so that a strip of clear glass is left between that and the picture. The tissue is placed on the transparency, collodion side downwards, and exposed to the light in an ordinary pressure frame. The exposure should be about three times that required for an ordinary carbon print, with tissue of equal sensitiveness. The development is conducted as follows:—Some glass plates are coated with a substratum of gelatine. One ounce of gelatine to a pint of water, with sufficient chrome alum added to render the film insoluble when dry; or, better still, a little bichromate of potash, enough to give it a pale yellow tint, the plates in this case being dried in full daylight. The exposed print is immersed, with one of the plates, in cold water, and when it it becomes slightly flaccid it is squeegeed on to the prepared glass. After resting for twenty minutes or so, the image is developed precisely as if it were a carbon print, except that a much longer time must be allowed for the operation, and considerably hotter water used. The development may extend from a couple of hours to twenty-four or longer. The usual plan is, after a good portion of the unaltered gelatine has been dissolved away, to put the plate in a grooved vessel of water, such as a tin washing trough, over a small gas flame or spirit lamp, and let it take care of itself, with occasional examinations. In the end an image will be obtained with a sufficiently high relief for the purpose.

When the developed relief has drained, until it has become surface dry, it is placed in methylated spirit for an hour or so, then taken out, and allowed to dry spontaneously. It is next coated with a thin solution of indiarubber in benzol—two or three grains to the ounce—drained, and dried. Then a thin and perfectly smooth sheet of tinfoil is laid upon it, and the whole passed several times between a pair of elastic rollers, which will cause the foil to adhere and take all the detail of the gelatine image. The domestic wringing machine will do perfectly well; but for small sizes, such as lantern slides, a soft rubber roller squeegee will answer perfectly. The relief is now ready for printing from. For transparencies on glass no press is necessary. All that has to be done is, after rubbing the surface of the tinfoil with a soft rag moistened with olive oil, to pour on the warmed gelatinous ink, press on the glass with a gentle pressure to squeeze out the superfluous ink, and

allow it to remain until the gelatine has set. It is then removed and allowed to dry spontaneously, when it is finished. Tinfoil is to be had coated with iron. Its surface is then as hard as the "steel facing" on an engraved copperplate; but, if only a few scores of impressions are wanted, the ordinary tinfoil of commerce will prove sufficiently durable. The printing, or rather moulding, ink is simply a strong solution of gelatine—say, sixty grains to the ounce of water—to which has been added any colouring matter that may be desired. Any colour can be employed, and the quantity of pigment added determines the density of the image; hence it can be regulated to suit the light of any lantern.

From the above brief description it will be seen that the stannotype process—and there is now no patent for it—offers no difficulties whatever to those who are familiar with carbon printing, which a large number of amateurs now are. A very comprehensive series of articles, giving full working details of the process, were given in our volume for 1884, which will be found of great service to those who may be inclined to essay the process, either for lantern slides or for paper prints.

The Photographic Society's Exhibition.—We understand that the number of pictures recently sent in to the Exhibition showed a considerable increase on those submitted last year. Having regard to certain events which have occurred in the history of the Society during the past few months, such a circumstance must be very gratifying to all those who are interested in its welfare. The Exhibition, which is to be inaugurated by the usual conversazione to-morrow (Saturday) evening, will be opened to the public on Monday next.

Hot Water and "Curled" Aristotypes.—In the course of a chatty discourse on American plates and printing processes before the London and Provincial Photographic Association, on Thursday week, Dr. Charles L. Mitchell, of Philadelphia, alluded to the fact that American workers of Aristotype paper—that is, collodio-chloride as distinct from the gelatine surface—remedy the tendency of the paper to curl in the solutions by treating it with boiling water. The hint should be of value to those experiencing a similar difficulty this side, always assuming, of course, that a collodion paper is in question. With gelatine paper such a remedy would be—well, unsuitable. By the way, Dr. Mitchell returned to America a week ago with, from what we gathered from him, the happiest impressions of his visit.

Cut Films in Professional Practice.—Although the value of cut films has long been established, more especially those of the smaller sizes, yet it is well that the endorsement of such a well-known practical man as Mr. William England should be put upon record. This veteran photographer, who has just returned from Switzerland, informs us that when he went abroad he took with him twenty-four dozen whole-plate and half-plate films, and, having developed them all, is in a position to say that he has not experienced a single failure directly or indirectly traceable to his having used films instead of glass, as formerly. His film holders are made with a slight curve, causing the films to assume a cylindrical bend towards the lens, and this enabled him to get marginal sharpness when employing a stop larger in size than would suffice if the film were impressed when in a flat position.

A Big Telescope.—Most of our readers will have come across one of the many accounts of the great telescope which is to be built for the projected Paris Exposition of 1900, and they have probably wondered what photographic results would probably be obtained from it. It is positively stated that the glass-works of St. Gobain have accepted the commission to make the objective, and that they will have it ready before 1900. So wonderful is the promised instrument that it is to bring the moon as near as a yard, or, at most, a metre! Now, to any one at all cognisant of optical matters, all this is simply nonsense, and even if we look upon the yard as a slip of the pen for mile the thing is practically impossible. With the great Lick telescope the moon may be brought within, apparently, about a hundred miles; under the most favourable conditions we could scarcely hope for an instrument ever to be made more than twice as powerful. Above all, the larger the instrument the more difficult to find an evening with suitable atmospheric conditions. A three-inch objective might be used almost any night, a three-foot but occasionally. Such a one as is now promised perhaps might be used once in a few years!

Daytime Seeing at the Lick Observatory.—Under the above heading a letter from the Lick Observatory, over the signature of Henry Crew, is printed in last week's *Nature*, giving the results of some very interesting experiments in the use of the telescope in daytime. Using the thirty-six-inch instrument, with a Rowland grating, he found it impossible to get any definition from the solar prominences. Then, working in the early morning, he tried the twelve and the six-inch equatorials. Result:—After half a dozen mornings' observations, *nil* with the thirty-six inch; general features considerably more distinct with the twelve-inch; but the fine, delicate tracings of the various parts of the prominence could only be seen with the six-inch. *En passant*, it may be noted that Mr. Crew finds the definition of the objective interfered with during daytime by the heated currents of air produced by the intensely hot sides of the cañons brought about by the sun's rays. By the way, there seems to be something very much amiss in the management of that institution, for within twelve months three eminent workers have seceded from its staff.

CONVENTION JOTTINGS.—IX.*

A Run through Some of the Scotch Studios.

JOHN FERGUS, Blackdales, Largs.

WE took train for Wemyss Bay, where Mr. John Fergus met us, and drove us down to his place at Largs—a charming drive along the fringe of the sea, with the Cumbrae Islands lying out to the right, and Fairlie away in the distance beyond Largs, with the yachts and boats dancing about in a silvery sea, bringing to mind that day we spent at the Glasgow Convention, when in these very waters so many of us went yacht shooting—a day to be remembered—when hundreds of plates were exposed, and many beautiful pictures were taken. We reached Largs, that village in a quiet corner of the Clyde, where Mr. Fergus has for years drawn thousands of people that have visited the place only for his pictures, his *clientèle* embracing all sorts and conditions of men, and women too, and from all parts of the world.

As we drove along, Mr. Fergus pointed out the little place where he made his first venture, and also the little well where in those early days he used to wash his prints.

And then we were shown the next studio that he occupied, one of larger growth, and more pretentious, bespeaking the steady growth of business in the little town, and from the front street we drive away up past the railway station, and on to the Fairlie road. At the foot of the hill, and surrounded with trees, we came upon Blackdales, the name of the estate on which the present studio is built. No need for Mr. Fergus to be in a public place now for business, for the visitors to his studio come with intent, as there is no such thing as chance business here.

The showroom is built along the edge of the roadway, being specially built for the purpose; it takes the form of a long picture gallery, and it is lighted from the roof. On entering this room, we find it furnished with settees and other easy lounging-chairs, a turkey carpet on the centre of the floor, the polished wood floor all round being left uncovered. This room is filled with the best examples of Mr. Fergus's work from carte up to life size, large work in platinum, bromides, and carbon being very prominent. The

* Concluded.

room is suitably arranged with stands and easels for the better display of these artistic productions.

Leaving this room, we pass through a corridor that leads us up some steps on the right to the main corridor, which stretches from end to end of the building; all along either side is arranged with draperies, statues, plants, and paintings, producing the most artistic of effects, as the receding objects lessen in the distance and the green leaves glisten in the sunshine outside.

The dressing-rooms enter from this gallery, the same rooms on the opposite side being in communication with the glass-house in which the sitter is to be taken.

The studio (or rather studios) is a long range of glass-houses, lofty and built dome shape, and so subdivided inside that it forms five or six complete studios, having partitions between the partitions themselves forming backgrounds and other effects for picture-making.

The first of these studios is furnished and arranged for taking those large "at home" pictures, of which Mr. Fergus has made a special feature, and which, in his hands, have proved such a success. All the furniture and fittings in this studio have been carefully thought out and arranged so as to represent the home drawing-room. Family groups can be, by this means, taken with all the semblance of being at home, giving an ease of pose and variety of position, which is a great advantage, pictorially, over the usual stereotyped studio group.

The other studios are each for certain classes of work. Mr. Fergus is a great believer in reflected light, and many of the finest effects that are to be seen in his pictures are produced by hand and other reflectors.

There are dark rooms in connexion with the studios, but the principal dark room is under the studio, with a convenient stair down. This is a large cool apartment, and must be pleasant to work in, being fitted with every appliance.

Here we saw a very ingenious contrivance in the way of developing rockers, the invention of Mr. Alexander, Mr. Fergus's manager.

This table is moved by an eccentric arm joined to a small water wheel, and has a balancing weight arranged at the other end of this table to the arm; ten or twelve trays can be arranged upon it, and when the water wheel is set a-going the liquid in the trays is kept in constant motion till the negatives are fully developed.

Mr. Alexander has had this machine in use for long before any of the advertised "rockers" were on the market.

Being pressed for room, Mr. Fergus has just had two new studios erected; they are also dome top; they enter from the small corridor that leads out of the showrooms. These two studios were scarcely finished when we were there, but have every chance of being in full swing now.

Some years ago Mr. Fergus opened a business in cameras, and as the season there was the quiet time at Largs he saw his way to work both, and he did a considerable trade, and was gathering around him a connexion of the highest order. The prosecution of this profitable speculation had to be abandoned last season, owing to Mr. Fergus turning seriously ill just when about to start, and the place had to remain closed. He may open it again next season.

We were glad to see, however, that Mr. Fergus had regained his usual good health. After spending a very pleasant and enjoyable day, in the most charming of places, under the charge of the most kindly and courteous of hosts, we left well pleased with our visit.

A. Swan Watson (View Park Studios, Edinburgh).

On our return to Edinburgh on our way south, we paid a visit to the View Park Art Studios, which were built out at Bruntsfield Links by Mr. A. Swan Watson, from Marshall Wane's. Mr. Watson, previous to going into business for himself, had made his mark in the profession in the production of cloud pictures and transparencies. The circular stand of transparencies that was on view at the Edinburgh International Photographic Exhibition, which created so much attention, was the work of Mr. Watson; and the two frames of portraits with new and unusual lighting shown at the Glasgow Exhibition—that were so much commented on and admired by many—were also his work.

View Park Studios is all built on one floor, and, having eighteen apartments, in all, covers a considerable piece of ground.

The reception-room is at the entrance-way, and is in the form of a gallery, forty feet long by twenty-four feet wide. It is lighted from the top, the light being well diffused through fine ground glass, giving a soft and subdued light to the whole room, freeing the pictures from glare and direct sunshine, which is so objectionable in rooms too brightly illuminated. All classes of work are here shown, from cabinets up to forty inches, in silver, carbon, and platinotype, the display showing considerable artistic arrangement.

Leaving the reception-room, we enter a corridor, wide and well lighted, ninety feet long, and decorated with plants. There are some twelve windows in this passage-way, and each of these is fitted with Mr. Watson's beautiful transparencies of cloud pictures, landscapes, seascapes, and portraits, which renders it quite an attractive spot to linger in a while. On the left-hand side of this corridor are situated the dressing-rooms and studios.

The first studio is forty feet long by twenty wide, with a steep ground-glass roof. Mr. Watson says that it is easily worked, as, having the light under control and very rapid, the largest pictures, under ordinary circumstances, do not take more than from five to six seconds' exposure. The fact that there are no houses or other obstructions, and nothing but clear sky all around, is the reason Mr. Watson assigns for the quick action in his studio. He uses the quickest plates manufactured.

The second studio is divided from this by a dark room, but so constructed as to make one large studio when required—which is pretty often—for his group pictures, a class of work that Mr. Watson makes a special feature of. The first studio is used for the usual portrait work, and the second one for all kinds of exterior effects.

There is still another studio behind, which, we remember well, Mr. Shaw had fitted up for boat pictures—with boat, and sail, and real water, and imitation rocks, &c.; but in Mr. Watson's business the space was too valuable to be set aside for this one purpose; besides, he can get the same class of picture in his exterior studio when desired.

The next room we come to is specially for the production of platinum pictures, and close to this is the silver-printing department. Then come we to the rolling, burnishing, and finishing.

Outside there is garden ground, where horses and other equestrian pictures are taken, backgrounds and other accessories being arranged for this class of work.

A very complete place, in a district as quiet and open as if away in the country, and that within a two-mile car ride from the centre of the city, makes it a business place to be envied.

A STANDARD DEVELOPER.

As you have referred to our researches in your article upon a standard developer, we should like, with your permission, to make a few remarks upon the subject.

We are entirely in accord with you that it is the exposure, and not the development, which rules the result due to the action of light on the sensitive plate. We also agree with you that one film may take five, while another may require ten, minutes' development in order to reach the same ultimate density. We, however, take exception to your view that similar isolated densities, resulting from similar exposures, would be a proof of equality of sensitiveness. This view would truly apply in the case of a series of gradations, but not in the case of single densities. We hope, as we proceed, to make this clear.

You say that the question has been raised whether, in making sensitometer trials, a fixed period of development should be adopted, or whether development should be allowed to act, so as "to get out as much as possible" from the exposure. You then state that, in your opinion, the latter is the better plan; and you are apparently under the impression that we participate in this opinion. This is not, by any means, the case, for it is a most important feature in our method of speed determination that the influence of time of development is altogether eliminated.

We have shown that while, with time of development, the densities do actually alter, their ratios remain constant; and as it is the relationship existing between a series of densities, and not the densities themselves, which determine the speed, time of development plays no part in the determination. Practically, it is well, on the one hand, to avoid very short, and, on the other hand, very long development. On account of irregular action, probably due to the physical resist-

ance of gelatine to penetration by the developer, very short development is undesirable, and very long development is liable to produce extreme densities, which present great difficulty in measuring. Hence we find it best, in practice, to reach a development factor of from 1·0 to 1·5; but the time required to do this varies, of course, with the plate, with the developer, and with the temperature. From a purely theoretical point of view, time of development has no influence whatever upon the result.

It would not be at all a safe conclusion to arrive at that if two films yielded the same ultimate density with the same exposure, even though different times of development might be required in the two cases to reach this density, the two films would be equally sensitive. The comparison of single densities can never be any criterion as to speed, nor would it be safe to conclude that a series of gradations produced by similar exposures on two different films would be alike, because one particular exposure led to similar isolated densities in the two cases.

A striking illustration of what we say has just occurred in the case of two speed determinations which we made a few days ago. The following table gives the density readings:—

Exposures C.M.S.	Plate A.	Plate B.
0·625	0·130	0·080
1·25	0·330	0·285
2·5	0·600	0·600
5	0·940	0·945
10	1·190	1·220
20	1·395	1·465
40	1·520	1·620
80	1·605	1·750

The two plates were simultaneously exposed for eight different periods, varying from 0·625 C.M.S. to 80 C.M.S. The development factor is the same in both cases, so that the development was continued up to and stopped at precisely the same point in each plate. It will be seen from these figures that no estimate of the relative speed of these plates could possibly be arrived at by comparing any corresponding pair of densities resulting from the same exposure. Take the two densities due to exposure 0·625 C.M.S.; A is greater than B, and hence the inference would be that A would be the quicker plate, because the light did more work with the same exposure. Next, take the two densities due to exposure 80 C.M.S.; B is greater than A, and B would now, for the same reason, appear to be the quicker plate. Lastly, take the densities due to exposure 2·5 C.M.S.; in this case they are equal, and the inference would be that the plates are of equal sensitiveness. So that, from this illustration, it will be seen that, from a mere comparison of corresponding single densities, either of these plates might be considered quicker than the other, or they might be considered as of equal speed.

As a matter of fact, the two plates are of almost equal rapidity, but this fact is ascertained by the relationship existing between the densities of each plate, individually considered, and has nothing to do with the relative values of the corresponding densities of the two plates. The difference in the gradations of the two plates is simply due to a difference in the amount of silver salt present on the plates, B being the more richly coated plate and having, in consequence, the greater capacity for truthful representation. Had the time of development been curtailed or prolonged in the case of either or both plates, it would have made no difference to the determination of the speed; the densities would, in these cases, have been generally increased or diminished, but their ratios would have remained unaltered.

The time of development required to reach a given development factor varies so widely in the case of different plates that no method of speed determination can ever be satisfactory in which the time of development has any influence upon the result.

With respect to your remarks upon the choice of a standard developer, we should like to say a few words. We are as fully convinced as we were when we wrote our original paper that, for the purpose of speed determination, and for scientific investigation generally, there is no developer comparable with ferrous oxalate. That developer must be the best, in our opinion, which has the least tendency to reduce silver salts which have not been submitted to the action of light, and, as far as our experience goes, ferrous oxalate bears the palm in this respect. We therefore strenuously urge its use for the purpose of speed determination by our method. You point out, as an objection to this developer, the difficulty of securing solutions of a uniform degree of saturation, but we have not found that any variation which takes place in practice has any appreciable influence upon the result. Any variation in this strength, within, at any rate, extremely wide limits, would merely hasten or retard the time of development; and this, as we have shown, would have no influence upon the speed, as determined by our method. The fact that time of development may be disregarded as a factor in the consideration of speed determination, renders fluctuations in the strength of the developer of much less importance than your article would indicate, and, in consequence, greatly facilitates the choice of a standard developer.

For ordinary photography, we are quite prepared to admit the claims of pyrogallol, and frequently resort to its use ourselves. It has, however, in common with all alkaline developers, a disagreeable tendency to attack silver salts which have not been exposed to the light, and this renders it inferior to ferrous oxalate for strictly scientific work. Otherwise, it is cleanly in use, economical, and convenient. Our objections to pyrogallol for scientific work apply, of course, most strongly when used in conjunction with ammonia.

With respect to those developers more recently introduced, we do not think they will ever become formidable rivals to ferrous oxalate and pyrogallol for general work. When we first published our investigations we had only had experience of hydroquinone and eikonogen, neither of which did we find up to them, to materially affect the speed of plates as determined by ferrous oxalate or pyrogallol. We pointed out, however, that there was a theoretical possibility of a plate being fast to one developer and slow to another.

We have recently made some investigations on development with rodinal, and the results so far indicate that this developer has the property of increasing the speed of some plates in a very marked degree. We say "some" plates advisedly, for, unfortunately, it does not apply to all; the speed of some plates is not increased at all under the influence of rodinal, while, in the case of others, it is materially augmented. As an illustration of this, we tested a plate recently, the speed of which, as determined by pyrogallol, was forty-seven, and, by rodinal, 155. To rodinal the plate was about three and a half times as fast as to pyrogallol, and this was fully confirmed by camera tests made afterwards. It appears to us that rodinal may prove of great value for "instantaneous" work, but plates would have to be selected for the purpose which are amenable to development by rodinal in this enhanced degree. As it is, it is impossible to state any general relation between the speed of a plate as developed by ferrous oxalate and by rodinal; the speed would require to be determined for each. The fact that rodinal, compared with ferrous oxalate or pyrogallol, affects different plates in different degrees can only be accounted for on the ground that plates are differently constituted with regard to the gelatine and halogen salts they contain, and this opens up a wide field for future inquiry.

F. Hurter.
V. C. Driffield.

DECORATIONS AND FITTINGS.

Perhaps nothing impresses prospective customers favourably or otherwise during a visit to the photographer's more than the appearance of the reception-rooms and studio. It is therefore to the interest of the business man to exercise every care that such impressions are pleasant ones. In this matter there is unlimited scope for the exercise of individual taste, very widely divergent schemes producing equally satisfactory effects. Where there is the advantage of a *lobby* opening directly into a thoroughfare it should be filled, but without crowding, with good and effective pictures, displaying to advantage the different kinds of work undertaken, all perfect copies, artistically arranged, and *frequently changed*. Something new will always attract the public, and to arrest the attention is the first step to securing the customer. The less ornament about this lobby the better: plain and good fittings are always to be preferred. There is a certain section of the public particularly active in damaging and defacing anything that at all lends itself to be maltreated, and light ornamental work within reach of mischievous fingers is sure to suffer, therefore the plainer and more solid the fittings the better, even at the sacrifice of prettiness. Next comes the staircase. For my own part I do not think it is a good plan to hang pictures on staircases, but the walls should be nicely decorated. Any special notices may be placed there perhaps with advantage, in such a position that they can be easily read as the customer enters or departs, at the same time avoiding anything of an attractive nature calculated to induce prolonged examination. The covering of the stairs depends very much on the class of customers, and beauty in this instance may give place to utility without infringing on good taste. The reception room is really the first apartment that requires special attention to its adornment, and no pains-

should be spared to make it as attractive as possible. In this room customers have to wait until the operator is at liberty to attend to them, and during this time they should be kept interested and in a good temper. Here, undoubtedly, is the best opportunity for the display of specimens, and shows of what stuff the reception-room lady is made by the exercise of her ability in securing good orders. A judicious selection of work is, therefore, a most important matter. The more varied and attractive it is the better is the chance of profitable business. If a fairly brisk trade is done, the specimens themselves or their position should be daily altered, but on no account should inferior work be exhibited. The public is insatiable in its desire for novelty, and, as in most houses the number of really good and attractive specimens is limited, the mere alteration of their position will in some degree supply the want. We must not look to quantity alone to secure customers, for a great crowd of fairly good portraits will have less beneficial effect on trade than a much less number chosen with judicious reference to their interest and quality. There are but few clients who will struggle through frame after frame containing hundreds of *cartes-de-visite* or cabinets. There is too much monotony about the proceeding, however good they may be, and their examination only evolves a sort of mental confusion instead of fixing in the mind some artistic and pretty pose that will induce a desire to possess a similar picture.

The usual effect of crowded frames of small works is that of obtaining a rapid survey in order to ascertain if there is any one amongst them known to the examiners, and if no one is discovered there is no further interest in the matter, when if a few of the same pictures were more isolated, would each command a more careful and critical examination, and probably have a much better business effect. Some of every kind of work undertaken by the firm should be represented, plainly but richly mounted and framed; in fact, the mounting and framing is most important if pictures are to be shown to the best advantage.

With respect to *cartes-de-visite* and similar small pictures, they are better enclosed in albums or folding cases where only one or two can be seen at a time, than arranged row above row in large frames like tailor's patterns, a plan so universally adopted. When the accommodation is sufficient, coloured work is best kept together, and not indiscriminately mixed with plain photographs, which invariably lose by the contrast. Enlargements should be hung or placed on easels so that they can be viewed at a *sufficient distance*, they *never* look to advantage from a near point of sight. A portfolio or a stand containing choice mounted platinotypes is an acquisition. Carbon and bromide prints are soon spoiled by friction when shown in this manner, but platinotypes will stand a good deal of hard wear before becoming defective. Any prints on gelatine surfaces are easily damaged, even albumen or silver prints get dull and scratched, and although tolerably hard soon lose their pristine freshness by rubbing much together. It is an excellent plan to protect each print with a piece of tissue paper fastened to one edge of the mount and covering the print.

It is usually found that when a picture, or anything else for that matter, is treated with special care, as is a valuable work, it will be handled much more carefully than if it was exhibited as only one of a large number deserving only ordinary attention. Its worth is undoubtedly enhanced in the eyes of others if the owner exhibits marked interest in its preservation independent of its intrinsic value.

(*To be concluded.*)

ON THINGS IN GENERAL.

Page 559 of this Journal contains two letters bearing on very important practical matters, the first being that over the signature of "Film Fiend," a writer who raises a question of the very highest importance with regard to the permanency or otherwise of gelatine dry-plate negatives treated with alum. Nineteen out of every twenty photographers who employ this chemical appear to be wholly ignorant of its true function or its possible after-effects. Most of them would say "No" to this statement; they know its use and properties quite well—"hypo is injurious left in print or negative, alum destroys the last trace of it; what more can be desired?" A half truth, of a very misleading nature! It is true alum does decompose hypo, but it does not "destroy" it; that would be an absurd supposition. It merely changes it into other chemical compounds, presumably less injurious than "hypo,"—a presumption not proved—but it does not get rid of the silver dissolved in the hypo, and the cause of much that is defective and fugacious in photographic prints is to be sought in the metamorphosis of that argentous residuum. As to the use of alum with negatives, it is commonly suggested that it removes the yellowness from pyro-developed plates, a function which is far better performed by a weak acid, and equally well, and far more safely, by acidifying the fixing solution with an acid sulphite, to which has been added, preferably, a little neutral sulphite. (By the bye, it is not generally known that the late Mr. H. Berkeley—who gave to an unheeding photographic community, and without charge, the knowledge of the use of sulphite—took out a patent for the use of acid sulphite in the fixing bath. As to the validity of the patent, if it had been continued, I offer no opinion). The only use, therefore, that alum can possess is as a hardener of the gelatine, and a frill preventer. It is useless to add it after fixing and complete washing; for, if the evil was to become manifest, it would have worked its fell way by this time. To use it soon after fixing constitutes the grave error I am lifting up my literary voice against. To use it before fixing will entail equal ill effects, unless a very thorough washing be given. We can now arrive at the point, and at Mr. "Film Fiend's" trouble. Alum or hypo is used first, a "rinse" is given, and then the other salt of the twain is put into use. I should like to remind every one who carries out such a course of treatment that a rinse is an absurdity, as applied to a gelatine film; a very thorough washing, extending over a considerable period of time, is necessary for the removal of any chemical from the substance of even a very thin layer of gelatine; the stream of water does not dash through the gelatine and reach the glass it lies upon; all that the stream of water does is to supply a continuous quantity of liquid, into which the salts pass by diffusion out of the gelatine. Hence, if any one give a slight time only, even in a strong current of water, to the removal of a chemical from the gelatine film, he will not succeed; his plate, when dry, will contain a residue of that chemical to work what evil it may. A plate rinsed from alum and placed in hypo will contain within itself the germs of future danger, and it will be remarkable if there be not found some amount of yellowing, if not worse, in any and every negative so treated after, say, a year's storage.

The second letter I allude to refers to the exceedingly simple piece of apparatus, the camera-back turn-button—those terribly annoying necessities with regard to which one feels that it is difficult to know whether they are more detrimental to the nails and digital extremities or to the mental equilibrium of a good man. Who is there that has not experienced the dead-lock—literally "lock"—that they present, always when most haste is needed, so that nothing but a hammer or pair of strong pincers will apparently shift them, and just when it is impossible to take the slide out of the dark room? Who that has not had the mortifying experience of seeing a button, that has worked itself loose without being detected, give way, and allow the plate to slip out just when an unusually successful exposure has been made? An amount of ingenuity, sufficient to build a score of Eiffel Towers, has been expended over every part of a camera, except this insignificant little adjunct. Surely, now this grievance has been aired *coram populo*, a little mental sleight will be expended in provising a remedy. Let us hope it may.

Miss Catharine Weed Barnes has given us some valuable practical remarks on American photographers and their apparatus. She may be right about the pull-out, instead of fixed, shutters to the dark slides; but I must say the only time I ever used such backs (true they were English-made, but of excellent quality) they played me a scurvy trick, and spoiled several plates, through the light gaining entrance when I inserted the shutter. It was a windy day, I admit, and the "black cloth" did not cover the camera as I should have liked: but, then, one ought not to be dependent upon a dark cloth to protect one's slides against light. Possibly they—the apparatus-makers—manage these things better in America.

Every one who reads the correspondence columns of the Journal will have been deeply interested in the discussion about assistants and their all-roundness. Mr. Wilson puts the matter in the proper light. Mr. J. Pike proves too much. He says an "older person," in two years' time, can learn much more than "to operate, retouch a little, print in various methods, enlarge, and copy." Most true; but what would be the value of his services in any one of those departments after the above varied experience? Just about what a porter could get, certainly not more. Any practical photographer knows that it

is absurd to suppose that a man, with so brief an experience, could do really good work in any one department. A first-class printer alone could not be made in two years, nor a retoucher who could earn thirty shillings a week; and as to operating, well, the thought of the possibility raises a smile. As to Mr. Pike's friend who, in two years' time, became expert in operating, printing in all known printing processes, enlarging, photo-mechanical and microscopic work, able to retouch and make slides, yet who found he could not obtain a salary approaching the hundred and fifty pounds a year he had previously obtained, I ask, is it possible, if Mr. Pike's letter is not a huge joke, that the reason of his failure is not seen? All I can say is that, if such a photographic Admirable Crichton applied to me, in the event of my wanting a capable operator or printer in any one known process, or retoucher, I would not take the trouble to read his testimonials! FREE LANCE.

DR. H. W. VOGEL ON THE DECAY OF PROFESSIONAL PHOTOGRAPHY.

IN THE BRITISH JOURNAL OF PHOTOGRAPHY of August 5 I find an article entitled, "The Decay of Professional Photography," says Dr. Vogel, in *Anthony's Bulletin*. The contents of this article are almost synonymous with a letter received by me from Herr Paar. The evil seems, therefore, to be a general one, and deserves the greatest attention. Herr Paar writes:—

"The relation of any class of society to the book trade is the surest educational test." This is the expression of a man of celebrity. Education is, indeed, transposed knowledge, and knowledge has to be acquired, must be learned. The book trade now is the mediator between the majority needing instruction and the single members of society having instructive capacity, whose liberated products of intellect are offered to the former. Teaching and learning were in former times the privilege of a few; to-day they are the common property of everybody, and still how few make use of the latter! Without the book trade, no education, no progressive culture. The conclusion is, that the more intimate the intercourse of a certain class of people is with the book trade, the higher must be the degree of education. The contrary conclusion would consequently be that, the more deficient the intercourse of another class is with the book trade, the more deficient must be the educational degree of this same class, and that it is high time for this part of society to remove the evil. What class of society is in this condition? One of the most prominent merchants in the book trade gives us the necessary information. Listen!

"The professional photographic circles are not very generous buyers of photographic literature, and if it was not for the amateur photographers it would be impossible to do business in that line."

This is a judgment, just as annihilating as short, which has been passed by that gentleman during a correspondence with me, and his professional standing is sufficient guarantee for the correctness of his assertion. Unfortunately, it is not very flattering to belong to a class of society about which sentence is pronounced in such a way. The deficient demand for photo-literary products is by no means a final proof of the deficiency of a requirement for intellectual products. Well, there is hope, then; let us stick to it like the drowning person to a straw; may it never prove to be treacherous. I, for my part, will not put my foot in the bottom of such a frail craft.

What, now, is the cause of this evil? That it exists, this prime defect of our elementary education, we cannot help. But that it remains in evidence and will never make way, even in later years, that is our fault, and the reason is to be found in everything. Professional papers and institutions, unions of employers and *employés*, rival in the endeavour to finish the roof of a building whose foundation is wanting, and some even take pains to carry away some of the building stone, collected without selfishness by the more meritorious. Therefore, you gentlemen of the pen, look for the good where you can find it, and help to distribute it; the bad may pass away without your help. Try your best to induce people to read and learn, but do not attempt to extinguish it. Knowledge of the situation will be a natural result of reading and learning. An energetic perseverance is, of course, a necessary requirement. Take, for instance, the province of Silesia, and here is an inevitable fact, that eighty per cent. of the subscribers of a photographic paper lay the same aside unread, while of the other twenty per cent. one-half read nothing but the advertisements. The proportion would probably be a more favourable one if I had found better opportunity for collecting information in amateur circles. I was restricted mostly to professional photographers.

Again I ask, What is the reason? Simply because our photographers do not care about learning anything to increase their knowledge. They abuse the amateurs, whose number increases daily, and do not consider that, if they gain superiority, the reason is only in their greater education and intelligence. Only with education and intelligence can they meet the increasing competition of the amateurs.

At a meeting held some time ago about photography and printing processes, there was only one photographer in an audience of 500, and he said, "Yes! yes! my colleagues know already too much." The same has taken place at meetings in other cities. Only in the United States I had in that respect good success, and had always a full house, in spite of my bad English; and I may pronounce with safety that the acquisition of intelligence and learning is there more popular than in the old world.

CONTINENTAL NOTES AND NEWS.

The Brussels Congress, 1891.—We have received the report of the International Congress of Photography which was held at Brussels in the month of August last year. The volume extends to 150 pages, and gives a detailed account of the proceedings of the Congress, with the chief points of which our readers have already been made acquainted.

A Non-alcoholic Varnish.—According to the *Archiv*, the following varnish without alcohol answers well for prints, negatives, &c.:—

Water	320 parts.
White gum lac	32 „
Borax	8 „
Carbonate of soda	2 „
Glycerine	2 „

The borax and the soda are dissolved in 160 parts of the water, the gum then being added. After filtration, the glycerine in the remaining 160 parts of water are added. The deposit which forms after a time is removed by filtration, and the varnish is ready for use.

Rodinal.—In examining the properties of this developer, Dr. Andresen recommends that development should be commenced with a weak solution, 1·30, and, if necessary, followed by a solution composed as follows:—

Rodinal	30 c.c.
Potassium bromide	10 grammes.
Water	30 c.c.

Rodinal is not affected by fluctuations of temperature. The negatives are said to appear to lose density in the fixing bath, so that development is recommended to be carried to a greater length than usual.

Blackening Film-carriers.—The following formula is recommended for blackening those parts of film-carriers which are made of zinc, and require to be so treated:—

Nitrate of zinc	2 parts by weight.
Chloride of copper	3 „
Hydrochloric acid	8 „
Distilled water	64 „

The hydrochloric acid is added after the salts have been dissolved, and the zinc is plunged into the solution after it has been cleaned with sand.

A Modified Platinum Process.—M. Ganichot, in *Science en Famille*, claims to have secured excellent results with a paper prepared in this manner: To 1000 parts of distilled water he adds 125 grammes of perchloride of iron, and, after filtration, adds liquor ammoniæ until precipitation of the hydrated ferric oxide ceases, to which, after it has been washed, is added a hot solution consisting of 50 grammes of oxalic acid in 150 c.c. of water. In order to assure the neutrality of this solution, a little of the ferric oxide is left undissolved. After filtration, 2·50 grammes of chloro-platinite of soda are added, and the solution made up to a volume of 250 c.c. with distilled water. The paper is coated, dried, and printed in the usual way, and the image developed in a bath of—

Oxalic acid	25 grammes.
Chloro-platinite of soda	2·50 „
Water	250 c.c.

The presence of the platinum in the developer as well as in the paper is explained by the circumstance that the latter is insufficient to form an image. The process is said to give excellent detail and freedom from excessive contrasts, and, by the employment of chloro-platinite of soda, the paper is stated to be impervious to the effects of damp.

Toning after Fixing.—Captain Pizzighelli is responsible for the following formula for toning after fixing. The solution is said to give blue-black tones, and to keep indefinitely.

Ammonium sulpho-cyanide	30 grammes.
Gold chloride	3 „
Caustic potash	3 „
Water	100 grammes.

Hypo "Cartridges" and Developer "Pastils."—At the Vienna Society a few weeks back, samples of hypo cartridges were shown, each containing sufficient fixing agent to make 200 c.c. of solution at a strength of 1:4. A refinement of the same idea has been invented by M. Loeblein, of Carlsruhe—compressed developer pastils to wit. Sugar paste is the vehicle, and at one side it holds the alkali and at the other the reducing agent. What next?

Honours for Dr. Eder.—By an Imperial decree, Dr. J. M. Eder, the famous director of the Vienna High School of Photography, has been nominated Professor Extraordinary of Photo-chemistry at the Polytechnic School of the same town.

Enamelling Without Collodion or Gelatine.—The *Progrès Photographique* says that, for this purpose, equal parts of oxgall and alcohol should be let stand for three days, when it should be filtered for use. A glass plate is then coated with the solution, and the print laid upon it in close contact. After drying, which takes about an hour, a sheet of paper is pasted on the back of the print, the paper being then coated with a mixture of gum, dextrine, and a little glycerine. The whole being dry is removed from the plate, and applied with pressure to a mount previously wetted, in order to have the print mounted with a full gloss.

ASTRONOMICAL PHOTOGRAPHY.

[Hiawatha Camera Club, Minneapolis.]

The history of astronomical photography begins almost with that of photography itself. When the scientist, Arago, on August 19, 1839, announced to the French Academy of Sciences the great invention of Daguerre, he coupled with his announcement proposals to use the new art in obtaining pictures of the moon and of the solar spectrum. Arago characterised the invention as "a new instrument for the study of nature," the manifold uses of which must baffle, and would assuredly surpass, prediction. "In such matters as this," said he, "we must count most upon the unforeseen." And, indeed, the unforeseen has come to pass. Arago, with all his willingness to allow incalculable possibilities, would, doubtless, have been staggered by a forecast of the work now actually being done. The first attempts, however, at celestial photography proved disappointing failures. At Arago's suggestion, Daguerre exposed one of his sensitive plates to the rays of the moon, but with no result. In 1840, Dr. J. W. Draper, of New York, obtained a Daguerreotype of the moon, very imperfect, indeed, but prophetic of future success with proper appliances. He also, within a few years, obtained the first picture of the solar spectrum.

The First Star Photograph.

In 1850, the first star photograph, and also the first good photographs of the moon, were made by Professor G. P. Bond at Harvard College Observatory. The exhibition of one of these lunar photographs at the London Exhibition, in 1851, excited much interest, and was the means of stimulating Mr. Warren de la Rue, of London, to take up the study of this subject. He constructed for himself a thirteen-inch reflecting telescope, and, using the wet-collodion process, which had just then been discovered, obtained much better pictures of the moon than those by Bond.

In 1860 the first successful attempt was made to photograph the solar prominences or coloured flames around the edge of the sun at the time of a total eclipse, by Mr. De la Rue and Father Secchi. These photographs settled the question whether the prominences were appendages of the sun or of the moon, by showing the advance of the moon over them.

Rutherfurd's Refracting Telescope.

In 1864 a great step in advance was made by Mr. Rutherfurd, of New York, who constructed a refracting telescope with an object-glass of 11 in. aperture, designed expressly for photographic work. Let me say, in explanation here, that the rays of light which make the impression upon the sensitive plate are not the same as those which impress the retina of the eye. They are, in fact, most of them invisible to the eye. In the construction of the ordinary visual telescope the object-glass is so made as to bring to the same focus all the rays which are conspicuous to the eye, allowing all the others to go wild. The chemical rays of light, which are mostly invisible, do not come to focus at any one point, so that a perfect telescope for visual purposes will be a very poor photographic one; and *vice versâ*, if the chemical rays are brought to a single focus, the visual rays must go wild, so that a photographic telescope is worthless for visual purposes. Mr. Rutherfurd set the example of deliberately constructing a telescope totally unserviceable to the eye. With this telescope he obtained photographs of the sun, moon, and star clusters, some of which have not been surpassed until within the last two or three years. The reflecting telescope is not subject to the same difficulties in respect to focus as the refractor; all rays of light are brought to the same focus in the reflector. But there are other drawbacks to the use of this kind of telescope which have led most astronomers to prefer refractors. These difficulties have largely been overcome in the last few years, so that some of the best photographic work is now being done with large reflectors. The largest now in use is one with a 5 ft. mirror, recently completed by Mr. Common in England, and with which he is said to have obtained some excellent photographs of the planet Jupiter enlarged to one inch in diameter. Mr. Rutherfurd's work with his photographic refractor, and that of Dr. Henry Draper, of New York, with a 15 in. silver-on-glass reflector, at about the same time, may be regarded as the culmination of the art of celestial photography in its second or wet-collodion stage. The pictures, though excellent, did not compare with the views to be had through an ordinary 4 in. or 5 in. telescope. The plates were not sensitive enough for the very short exposures necessary to give sharp pictures of the moon and planets; on the other hand, the necessity of their being "wet" precluded the possibility of the long exposures necessary to impress upon the plate the images of very faint stars and nebulæ.

Little more was done on these lines for the next twenty years. The sun has, however, been photographed regularly at three or four different stations on the earth, so that we have an almost daily photographic record of the appearance of the sun since 1870.

Gelatine Plates and Astronomical Photography.

The introduction of the dry-plate process in 1871, and the subsequent rapid increase in the sensitiveness of the plates produced, have led to a wonderful development of the art of photography as applied to all branches of physical science, and especially to astronomy. The increased sensitiveness of the plates permits the exposures on bright objects to be shortened to such an extent that atmospheric disturbances produce but little effect in blurring the images—a difficulty which could not be avoided before. Photographs of the moon can be taken in less than one-half second, and the brighter planets in an almost equally short time. It is possible to photograph the sun in 1-100,000th of a second. Indeed, with the plates now on the market, it is difficult to make the exposure short enough. On the other hand, with dry plates the exposure on faint objects can be prolonged indefinitely with ever-increasing effect. Impressions on the sensitive plate are cumulative as well as permanent; those upon the living retina are neither. Impressions upon the human eye last but a small fraction of a second; after that length of time there is continual effacement and renewal. If this were not so, we could not so quickly turn our view from one object to another. Continual gazing at a faint star makes it no brighter to the sight. If we could lengthen the impression to one second, the sky would be almost ten ten times as bright as it is—*i.e.*, like the Milky Way, dimly luminous with minute stars. On the sensitive plate, however, the impression once made is permanent. The tiny ray of light from a distant star, which would make no impression on the eye, by its continued pulsations against the gelatine films, shakes apart one by one the molecules of the silver salts, until finally a perceptible image of the star is engraved. Thus it is that we are able to say we can photograph that which is invisible. It is possible too that there may be stars photographically bright which emit none of the visual rays, but whose light is wholly composed of the

invisible rays at the ultra-violet end of the spectrum. We have no evidence of such as yet; certainly no conspicuous ones have been found on the photographs.

Dr. Huggins, in England, was the first to perceive the singular adaptation of the dry plates to celestial research, and to use them in his experiments on photographing stellar spectra. His advice and example were followed a few years later by Draper and Gould in America and by Common and Jannsen in Europe. Other astronomers held aloof from the new methods, distrusting photography as a means of obtaining either perfect pictures or accurate measurements of the heavenly bodies.

Dr. Gill's Work.

In 1874 the transit of Venus was photographed at many places on the earth by expeditions sent out by the various Governments. The total failure of most of these photographs to give accurate measurements of the solar parallax added to the distrust in which photography was then held. The Americans, however, tried it again in 1882, and the results recently published of the measures of about 1600 photographs prove conclusively that photography can be relied upon as a means of accurate measurement. The decisive impulse toward the great astronomical undertaking of to-day came from the Cape of Good Hope. Dr. Gill, the Royal Astronomer, was one of the old school, devoted to accurate measurements with the meridian circle and the heliometer, little suspecting that in the camera an instrument was at hand more rapidly effective for the purposes of practical astronomy than the transit and heliometer. But in 1882 the splendid appearance of a great comet in the southern heavens challenged portrayal. Dr. Gill was not slow to make use of the means at hand, which were the two and a half inch camera and the experience of a local photographer, Mr. Aldis. Attaching the camera to the great equatorial, and using the latter as a guide to keep the image of the comet upon the same part of the sensitive plate, exposures of from half an hour to two hours and twenty minutes were made. The result was a series of pictures remarkable not only for the fidelity with which the comet was represented, but also for the accessory wealth of stars they displayed. The entire background was thickly strewn with them. Forty or fifty, down to the ninth magnitude, shone across the interposed film of the comet's tail. The exhibition of these photographs stirred up a great deal of interest in the subject of star-charting. They emphasised the advantages to be derived from the use of lenses of short focus and wide field, giving small bright images of tolerably extensive portions of sky. Experiments were begun in many quarters. Dr. Gill began at once a photographic survey of the southern heavens to supplement the work already done in the north by the old methods of Argelander. Professor Pickering, at Harvard College, and Espin and Roberts, of England, took up lines of photographic research, in which they have achieved eminent success.

The Brothers Henry at the Paris Observatory.

At the Paris Observatory at this time were two brothers, Paul and Prosper Henry by name, working together, charting by the old methods the faint stars along the ecliptic, with the purpose of discovering asteroids, or small planets. In ten years they had constructed sixteen maps of the seventy-two required. At the place where the ecliptic crosses the Milky Way an almost insuperable difficulty met them. The stars were so numerous that it was almost impossible to chart them by eye and hand. A glance at Dr. Gill's comet picture, with its starry background, suggested the way out of their difficulty; and at once they determined to give up the old method of charting by the eye and hand, and have recourse to photography. They set about the construction of a telescope on a novel plan—a twin telescope having two objectives, one adapted for chemical, the other for visual rays, enclosed in a single rectangular tube. The photographic objective is of thirteen inches aperture and eleven feet focus, its curves being computed so as to enable it to take in a wide area of the sky without sensible deformation of the images. The observer looks through the visual portion of the telescope at one of the brighter stars in the field of view, and keeps it constantly at the intersection of a pair of cross-threads, correcting by means of adjusting screws any irregularity of the movement of the driving clock. With this apparatus, during 1885 and 1886, many photographs were taken, surpassing in excellence anything ever seen before. Stars and nebulæ never seen were depicted on the plates. On one of them, covering an area of about four square degrees in the constellation of Cygnus, where 170 stars had previously been identified, some 5000 were clearly imprinted. In the familiar group of the Pleiades, where the best map before made, the result of many years' labour, contained 671 stars, photographs taken by the Henrys supply the material for charting 1421 stars, with a precision never reached by visual observations.

The Photographic Chart of the Heavens.

The significance of these results could not be mistaken. They pointed to a great task, no less than a complete photographic chart of the whole heavens. Dr. Gill proposed, in 1886, an international congress of astronomers to consider the question. The congress met in Paris in April, 1887, fifty-five delegates of fifteen different nationalities. They agreed to undertake the task, and appointed committees to consider best methods of work and of preservation of plates, &c., while the instruments were being constructed.

At a meeting of the permanent committee last year it was reported that seventeen observatories were ready to co-operate in the work; all the instruments had been finished, and most of them had already taken experimental photographs. The sky had been divided into zones, and these zones apportioned to the different observatories in such a manner as to make the conditions of observing as nearly alike as possible. The telescopes are all essentially alike, the plates are to be of the same size, made by the same formula, and developed in the same manner.

We have thus already begun the stupendous task of photographing on a large scale, and in a short time, the whole heavens. It will require over 10,000 plates to cover the sky, and each is to be done in duplicate. Allowing for failures, something over 25,000 plates will have to be exposed. The exposure is to be one hour for each. A second set of plates is to be made, with an exposure of only ten or fifteen minutes, for measurement of the places of the brighter stars and the construction of a catalogue. It is estimated that this catalogue will contain 2,000,000 stars, while the chart will show not less than 20,000,000, and possibly 50,000,000 or 60,000,000. The whole work of taking the plates ought to be finished within about five years.

While the preparations for this great chart have been going on, Professor Pickering, of Harvard College Observatory, has been making one of his own with an eight-inch telescope of different construction, and bids fair to have it all done before the others have fairly begun. At present a party of Harvard observers is in Peru, making a survey of the southern heavens to join on with that already finished in the north. Mr. Isaac Roberts, in England, has, within the last three years, obtained some marvellously perfect pictures of the nebulæ and star-clusters with his twenty-inch reflector. Messrs. Barnard at Lick Observatory, Russell at Sydney (Australia), and Wolf at Heidelberg, have been doing some wonderful work with large portrait lenses and long exposures of from two to five hours. The last-named has even exposed one plate thirteen hours, bringing to light unsuspected details as to the structure of the stellar universe.

Lastly, I must mention the achievements of a young astronomer in Chicago, Mr. George E. Hale, director of the Kenwood Physical Observatory, who has, during the past year, discovered a method of photographing the coloured prominences of the edge of the sun without an eclipse, of photographing them all around the edge of the sun at one exposure, and of photographing the white spots, called faculæ, on all parts of the solar disc, whereas they have hitherto been visible only near the edge. The science is advancing so rapidly that it is difficult to keep pace with it. Each year, each month even, brings forth that which was unforeseen. That there are yet rich treasures in store for those who diligently search we can have no doubt.

H. C. Wilson.

DETECTIVE, HAND, AND MAGAZINE CAMERAS.

[Journal of the Photographic Society of India.]

The variety of the above-named class of cameras, with which the market is now stocked, is so great as to cause selection to be difficult. I have therefore put together a few observations which may assist an intending user in deciding what kind of camera he will buy or make.

I will deal first with the exposing shutter, with which all cameras of this class are provided. All are made to give very rapid and also time-exposures.

If the shutter, when set for a time-exposure, flies up with a jerk, remains open for such time as an elastic ball or a button be held pressed, and flies back with a jerk when the pressure is released, it will almost invariably shake the camera more or less, and the effect of the shake will be distinctly noticeable when a short exposure of less than two seconds is given. It is well, therefore, to have the power of exposing by hand—that is to say, by capping and uncapping the lens or aperture through which the lens looks.

If the exposure has to be made by pressing a button or pulling a string, the action is very likely to cause shake, whether the exposure be long or short, and whether the camera is held in the hand or attached to a stand. An exposure actuated by a pneumatic ball and tube is therefore preferable.

A hand camera may be of any size and any shape which it is pos-

sible for the operator to lift, point at the object, and fire off a shutter whilst so pointed, but it is likely to be an inconvenient companion of larger than half-plate size.

Any small camera with good light-tight slides or backs, and a quick shutter, will do as a hand camera. Some people like to have a finder, which can be easily attached; many prefer to work without any finder. I consider the finder exceedingly useful. Hand cameras may be divided into two classes—automatic and manual, both these classes including magazines. In the automatic class, a button or something is pulled or pushed, and a fresh plate from the magazine or reserve takes the place of the plate last exposed. In the manual class the plates may be carried in backs, and inserted or fitted to the camera in the usual way, or the exposed plate may be raised by a lever grasped by the hand and placed at the back of the reserve of plates, or the back plate of the reserve may be raised and placed in front of the last-exposed plate.

This latter plan is that adopted in one camera which has the following defects:—Unless the magazine is fully charged with the dozen plates or dummies, it will not work at all; and, if you want to expose only two plates, you must carry the weight of ten extra ones, for, if even one sheath is empty, the apparatus will not work.

Again, if you have twelve sensitive plates in the magazine, and, having exposed only one, wish to develop it at once, you must remove eleven plates to get at the one you want.

In another camera of this form this last defect does not exist, as it is the exposed plate which is removed and placed in rear of the unexposed lot.

In all cameras of this class, as well as in most of the automatic class, the plates are held in metal sheaths, and these sheaths, whether of zinc or iron, are liable to rust or oxidise, and the oxide comes off and makes spots on the plates.

Varnishing the sheaths is fatal, but the metal sheaths may be dipped in boiling paraffin wax, the surplus wax rubbed off, and this will, to a great extent, prevent the evil.

A convenient kind of hand camera which may be made by the amateur (with the exception of the carriers or dark slides) is a box camera with an ever-set shutter (such as the *Automatique*) fixed inside opposite the hole of the lens mount. The lens should screw on outside, as in any ordinary camera, and should have a rack and pinion or a draw tube for focussing, for, the camera being a mere box, no focussing can be done with it.

The length of the camera should be arranged so that, when the lens is racked or pushed right home, the plate shall be in focus for distant objects; and for nearer objects the lens can be extended, the focussing being done on a focussing screen as usual, or preferably by marks on the lens tube previously arranged for various distances. The plates are carried in dark backs, which slide or clamp into position. A leather handle on the top of the box facilitates carriage, and a screw-hole should be placed in the bottom and side of the box for use when it is desired to use a stand. The camera, if cunningly made, will carry a couple of extra dark backs inside, and can be fitted with finders inside or out. I consider this camera preferable to the kind in which an ordinary bellows camera is contained in a box with a hole in front for the lens to look out.

The best kind of dark back for a camera, such as I have described, is that in which the shutter of the back draws entirely out. Chadwick, of Manchester, makes a very superior camera of this class. It has, however, a bellows-body, and has to be "set up" each time it is required for use, so that it is not so constantly ready as the box I have described, but it has many qualities which render it superior to the box. It will take stereo pictures on a half-plate or on two quarter-plates, and it will take pictures the full size of the half-plate, and is, besides, a thoroughly good working camera for all sorts of work. The box form is superior only in solidity, simplicity, cheapness, and ever-readiness. Again, any camera may be fitted with a roll-holder, to carry a roll of sensitive film. No magazine camera yet devised can compare in convenience with this method, as the exposures can be made one after another with considerable rapidity, and the use of the film reduces the weight to a minimum.

Of this form of camera I have seen none to excel the Kodak. Of the automatic class, I know of none better than the Ideal. Of the manual class, I like Chadwick's, and a magazine camera made by Stirn on the principle of the Eureka. To sum up, in selecting a hand camera the following points should be considered:—

1. Is the arrangement for changing plates (whether automatic or manual) simple and certain in action?
2. Is there means of altering the focus?
3. Is there means to alter the aperture of lens?
4. Can the camera be used for ordinary work, such as enlarging, reducing, &c.?
5. Can the apparatus be carried about without inconvenience, and constantly ready for immediate use?
6. Is the instantaneous shutter of a type which is ever set ready for action which will not shake the camera in discharge, and which will admit of time exposures being given without shake?
7. Can the lens be easily removed for cleaning?
8. Is the instantaneous shutter totally devoid of indiarubber blinds or bands which will not stand a tropical climate?

According to the number of these questions which the camera will answer satisfactorily will, in my opinion, depend its utility.

J. C. Hannyngton.

THE ALLEGED FADING OF SILVER PRINTS.

Readers of the *Beacon* (says that journal) know that we have no great favour for silver prints, or, at least, the ordinary albumenised-paper variety, and believe that sooner or later—and think the sooner the better—they will, like many other once-popular things, be relegated to the limbo of forgetfulness.

But, although it has many faults, and no virtues equal to many, or least several, of its more modern competitors, that is no reason why it should be blamed for those it does not possess, or get a worse name than it deserves.

That some silver prints do fade, no one can doubt who looks into an ordinary photographic album, and we shall not be far from the mark if we say that a large majority of all those that have been made during the past fifteen or twenty years have faded more or less, or have within them the elements that lead to fading. Still, although ninety-nine out of a hundred may have given way, if the remaining one has stood the test of twenty years without deterioration, further than the natural yellowing of the paper on which it was printed, we are entitled to claim for silver prints a degree of permanency far beyond what is being generally ascribed to them.

That silver prints have been made that are practically permanent, we have abundant evidence both in our own and other collections. Lying before us while we write are some 9 × 11 prints from wax-paper negatives, made by ourselves at least thirty years ago, some from collodion negatives of a slightly more recent date, and some printed by the once well-known McGlashan, of Edinburgh, from negatives by Hill & Adamson, and they all seem as perfect as on the day they were produced, except for a allght mellowing or yellowing of the paper. Some are on plain paper, sensitised on an ammonio-nitrate bath, and some on home-albumenised paper, and all toned in one solution, the old fixing and toning bath.

Those were the days of dark tones, when the nearer to the appearance of an ordinary engraving the better we were pleased, and the negatives were dense and brilliant enough to admit of deep printing on paper strongly salted and sensitised on strong solutions. Some of the prints in our possession are in portfolios and some in frames, and several have crossed the Atlantic four times.

Our attention has been turned to this subject by the reading of a paper recently read by Mr. H. P. Robinson before the members of the London Camera Club, in which the cause of fading is laid on the shoulders of the chemists. He says, "The whole mischief has arisen from the interference and exceeding cleverness of [our chemists, and the progress of photography has been much retarded by the inventions of science," a statement which we are sure he will be inclined to modify on calm consideration.

As a proof of his contention that photographs made before the alleged unfavourable interference of the chemists were practically permanent, Mr. Robinson showed a copy of his well-known picture, *Fading Away*, which he declared to be as perfect as when printed, nearly thirty-five years ago. That it is so we do not doubt, but we are equally persuaded that such fading as may arise from the more recent methods devised by the chemists and scientists is not due to the use but to the abuse of those methods—to their ignorant or careless application.

In the face of much adverse criticism we have always thought well and spoken well of the old combined toning and fixing solution, and consequently are glad to see that Mr. Robinson's *Fading Away*, that has not faded, was so toned and fixed. The formula he gives is:—

Water	60 ounces.
Sodium hyposulphite	16 ,,
Chloride of gold	15 grains.
Nitrate of silver	15 ,,

which sometimes took the form of "a jug of water, a tube of gold, and a bit of nitrate of silver."

We do not suppose that photographers generally work thus by rule of thumb, but the most carefully compounded formula is just so much

labour in vain where its application is gone about in an ignorant or perfunctory way.

During the early days of photography, and especially with such prints as we have mentioned, the whole work was carried on with greater care and less haste than now. The prints were fewer in number and larger in size than is the present average, and each was specially and lovingly treated, generally by the photographer himself, who, as the prices were good and the orders confined to but a few copies, could afford to give to the work an amount of attentive care that would be out of the question under present circumstances.

To competition and its consequent low prices, then, we must, to a large extent, attribute the fading incident to faulty manipulation. To facilitate rapid printing, negatives are made so thin that only a slight surface reduction of silver is required to give the popular warm browns, and consequently the amount of gold which formerly was sufficient to protect the silver is reduced to the infinitesimal.

Then, instead of only a few prints, as in former times, they are now produced in large numbers, and fixed, probably several hundreds at a time, in one tray, and not unfrequently in a hypo solution that has been employed probably more than once before, and contains silver hyposulphite, and in consequence of the foolish addition of alum, free sulphur, which, when in a nascent state, may readily enter into combinations that lead to fading. With several hundreds of prints in one tray it is nearly impossible to prevent adhesion, or secure equal and thorough fixing, so that many are transferred to the washing machine still charged with silver hyposulphite, which, being insoluble, remains there ready to exercise its destructive action after many days.

There are no doubt other causes of fading that are beyond the control of even the most careful and intelligent photographer, but we must leave them for a future article, and conclude this by a strong plea for the more general employment of the "old fixing and toning bath." It has been thoughtlessly condemned as a method of sulphur toning, but is only so when used longer than it should be—used long after the gold is exhausted, and the hypo converted into the double salt of hypo and silver. It is not a difficult matter to ascertain how many sheets of any particular depth of printing may be toned by a fifteen-grain tube of gold; and if the photographer will make his negatives sufficiently dense to admit of deep printing, not on the surface merely, but right through the albumen, and tone them in a new combined bath, or one that has not been exhausted by too frequent use, he may rely on his pictures being practically permanent, so far as he and his work are concerned.

We have said nothing about washing, because we do not believe that many cases of fading occur from insufficiency of that operation. A properly fixed print may be sufficiently washed by eight or ten changes of water, with ten or fifteen minutes' soaking between each change. No amount of washing will remove silver hyposulphite from an insufficiently fixed print, and a too protracted soaking will do harm. Mr. Robinson says the good old way was to apply a drop of the washing water to the tongue, and if it did not taste sweet, washing was complete, and we are not sure that after all this if not satisfactory. The tongue is a delicate test, and would certainly detect any trace of the salt that could injure a print.

Our Editorial Table.

We have received the new catalogue of Mr. William Tylar, of Birmingham. In the course of about a hundred pages it gives illustrated particulars of his numerous and clever specialities, together with many other articles of photographic utility. Mr. Tylar's catalogue affords an excellent idea of how luxurious the pursuit of modern photography has been rendered by commercial enterprise. It is full of "good things."

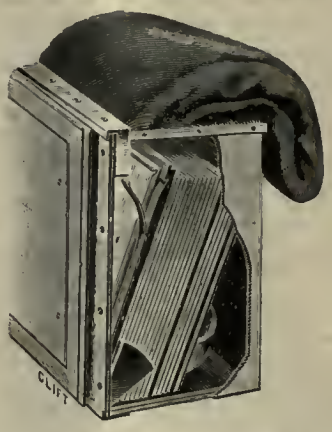
An "Outing Group."

For a year or two past the joint outing to the old-fashioned riverside suburb of Greenwich of those two admirable Societies, the Photographic Club and the London and Provincial Photographic Association, has been very popular with the members, our genial friend, Mr. A. Haddon, acting the part of the host in the domain of the Royal Naval College, and thus assuring the success of the gathering. On the occasion of the recent outing a 12 × 10 group of the members was taken under the direction of Mr. Haddon, which, considering the dull weather prevailing, is excellent. It includes, besides that of Mr. Haddon himself, portraits of several gentlemen whose names are familiar to readers of this Journal.

The "Kangaroo" Changing Box and Bag.

J. R. Gotz, 19, Buckingham-street, Strand.

This device for changing in the field possesses several highly novel points. It is intended for cut films, of which it will carry from two to three dozen in carriers, all or any number of which may be exposed and changed with remarkable facility. A single back of very slight width is employed, and this being placed *in situ* on the front of the box, at the rear of which are stacked the films, the method of filling the slide is as follows:—The hands being introduced into the bag on the top of the box, a trapdoor thereon is opened, the reeded shutter in front of the box is wound off, the shutter of the slide is released, being thrown back by springs as shown in the cut, and the first carrier containing a film being lifted up from the back is dropped



into its position in the slide, which, being closed, the reeded shutter is unwound, and the slide may then be withdrawn and used to expose the film in the camera in the ordinary way. To change the exposed film and substitute another, all that is necessary is to place the slide on the front of the box as before, draw off the reeded shutter, open the slide, withdraw the film, and place it at the back of the unexposed films, refill, and proceed as at first. A division at the back of the unexposed films separates them from those which have been exposed, so that no mistake is possible in distinguishing between exposed and unexposed. A whole-plate box and bag containing three dozen films weighs scarcely more than four slides containing eight glass plates, and measuring only about 10 × 8 × 4½ is easily carried. The Kangaroo is one of the simplest and most effective changing arrangements we have seen, and having recently had an opportunity of witnessing Mr. Gotz putting it to practical and successful service in the field, we are disposed to think that it will be found of very great use to those who desire to easily carry material for a large number of exposures with simple and reliable means for changing in the open.

Recepte und Tabellen fur Photographie und Reproductionstechnik.

By Dr. J. M. Eder. Halle-a-S.: William Knapp.

In this volume Dr. Eder has gathered together a collection of chemical and optical formulæ which completely traverse the entire field of practical photography. It should prove a most useful compilation to the busy photographer.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 16,377.—"A Walking-stick Camera Stand." E. C. Ouvry.—*Dated September* 13, 1892.

No. 16,441.—"Improvements in Show Cards, Calendars, Mounts for Photographs, and the like." J. Brewis, R. A. Brown, and A. B. Lennox.—*Dated September* 14, 1892.

No. 16,477.—"The Amateur's own Washer, with Automatic Syphon." F. Alston.—*Dated September* 15, 1892.

No. 16,481.—"An Improved Appliance for Printing Vignette Photographs." J. C. Rowbotham.—*Dated September* 15, 1892.

SPECIFICATION PUBLISHED.

1892.

No. 13,597.—"Stage Illusions, &c." Morritt.

PATENTS COMPLETED.

Improvements in Shutters for Photographic Cameras.

No. 17,516. John Edward Thornton and Edgar Pickard, St. Mary's-street, Deansgate, Manchester, Lancashire.—*August* 27, 1892.

This invention relates to what are known as "instantaneous shutters," and is designed with the object of providing such a shutter of simple construction, also of providing such shutters with an additional auxiliary or safety blind which will prevent light passing through whilst being set for exposure.

A box or frame, with an aperture or a perforated back and front of ordinary construction, carries both the exposing and the safety blinds, the former being mounted to run over one or two small rollers, one at each end of the box, and the latter attached to a spring roller at one end thereof.

The exposing blind is a square or rectangular piece of suitable opaque material, such as mackintosh, cloth, leather, or the like, of a size to cover either the back or front apertures. To one end of this opaque exposing blind two cords, chains, or strings are attached, which pass over the top roller and down through the bottom of the box, terminating in a ring, tassel, or knob; to the other end of this blind are attached or connected a spring or springs, preferably two fine steel spiral springs, which pass under the bottom roller and are carried upwards to the top of the box. Instead of these steel-wire springs, indiarubber springs may be used; or the blind may be attached, by means of cords or springs, to the barrel of a coiled or volute spring, or to a spring roller. Where the fine spiral springs are used, they may be fastened to the top of the box, or they may be connected to a cord or ring which can be drawn up and hooked over pins in various positions to vary the tension of the springs for the purpose of adjusting the speed of the shutter.

In the box between the top and bottom rollers we place a block or bar of wood or metal, either clear of the openings or with an aperture therein which corresponds therewith. On the back of this block or bar is placed a bevelled projection over which the blind slips, and catches on the underneath edge when drawn down to cover the apertures or close the shutter. A movable strip is hinged or pivoted between the block and the blind, by raising which the blind is lifted clear of the projecting catch and released for exposure. The strip may be lifted or moved by a cord, push, or pneumatic device of ordinary construction.

To the spring roller at the bottom of the box we attach one end of the safety blind, which is also of opaque material and of sufficient length when unwound to cover the opening in the box. To the other end of the safety blind we attach cords, chains, or strings which are passed over the top roller or through eyelets and down through the bottom of the box, where they connect with those attached to the other blind.

This safety blind may also be used with the blinds of instantaneous or time shutters, such as are at present in use, and it will also be obvious that the exposing blind herein described may be used without the safety blind, but at present we prefer to use the two together.

In operation, before exposure the exposing blind covers the front opening of the shutter, and the safety blind is wound upon the spring roller. To set the shutter, or adjust the blind for exposure, the two sets of cords are pulled together by the tassel. The two blinds are thus drawn forward at the same time, the end of one overlapping the end of the other, forming, as it were, one continuous blind. The cords are pulled until the exposing blind has passed from the back, over the top roller, to the front, whereupon it catches under the projection, and is held against the stress of the driving spring. It then covers the front aperture, so as to effectually exclude all light from passing through, and the safety blind, having served its purpose in covering the aperture until the exposing blind was in position, immediately, when the tassel is released, rewinds upon the spring roller. To make the exposure, the exposing blind is lifted clear of the projection by raising the hinged strip, and immediately the exposing blind flies back to its normal position, uncovering and recovering the aperture in its passage.

A shutter, with safety blind such as described, will be found especially suitable for hand cameras, though it will be useful for ordinary cameras.

The claims are:—1. A shutter for photographic cameras constructed with two flexible travelling blinds, one an exposing blind to open and close the lens or give an exposure when released, and the other an auxiliary safety blind to travel with and cover the edge or aperture of the exposing blind when it is being set to prevent light entering, and then return to its normal position. 2. A shutter for photographic cameras constructed with a flexible opaque exposure blind, which travels from the front to the back of the shutter over a small roller, to the corners of which are attached at one edge elongated springs, by which it is held and drawn back, and at the other edge cords, by which it is drawn forward, substantially as described. 3. A shutter for photographic cameras having an exposing blind, which travels from back to front of the shutter, actuated by elongated springs attached to the arms at one edge, and held in position when set by a projecting catch, with which one edge of the blind engages, and an auxiliary safety blind mounted on a spring roller, which is drawn forward across the lens with the exposing blind, and when released returns to its normal position, substantially as and for the purpose described.

Photographic Society of Great Britain.—The Technical Meeting, on September 27, will be held in the Gallery, 5A, Pall Mall East, at eight p.m. Subject, *Apparatus on View in the Exhibition.*

Leytonstone Camera Club.—The first annual competition and exhibition will take place at the Masonic Hall, High-road, Leytonstone, on November 10, 11, and 12, 1892. Open to amateurs only; professionals can exhibit, but not compete for prizes. Sixteen medals will be awarded, eight silver and eight bronze. The classes are:—*Members only:* A. Landscape, Seascape, and Architecture. B. Portraits and Figure Study. C. Enlargements. D. Lantern Slides (set of six). *Open:* E. Landscape, Seascape, and Architecture. F. Portraits and Figure Study. G. Enlargements. H. Lantern Slides (set of six). Entry forms and all other particulars may be obtained of Mr. A. E. Baller, Hon. Secretary Leytonstone Camera Club Exhibition Committee, Rose Bank, South West-road, Leytonstone, Essex.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
September 26 ...	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 26 ...	Gloucestershire	
,, 26 ...	North Middlesex	Jubilee Hall, Hornsey-road.
,, 26 ...	Rossendale (Annual)	Townsend-chambers, Rawtenstall.
,, 27 ...	Great Britain (Technical)	50, Great Russell-st., Bloomsbury.
,, 27 ...	Lancaster	Storey Institute, Lancaster.
,, 27 ...	Leith Amateur	
,, 27 ...	Warrington	Museum, Bold-street, Warrington.
,, 28 ...	Bath	Roy. Lit. & Sc. Inst., Terrace-walks.
,, 28 ...	Burnley	Bank Chambers, Hargreaves-street.
,, 28 ...	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 29 ...	Halifax Photo. Club	Mechanics' Hall, Halifax.
,, 29 ...	Hull	Royal Institution, Hull.
,, 29 ...	Liverpool Amateur	Crescent Chambers, 3, Lord-street.
,, 29 ...	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 29 ...	Oldham	The Lyceum, Union-street, Oldham.
,, 30 ...	Cardiff	
,, 30 ...	Holborn	
,, 30 ...	Maidstone	"The Palace," Maidstone.
,, 30 ...	Richmond	Greyhound Hotel, Richmond.
,, 30 ...	Swansea	Tenby Hotel, Swansea.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

September 15,—Mr. E. J. Wall in the chair.

The Chairman made a large presentation of photographic literature to the Association, and was cordially thanked by the members.

The following question from the box was read:—"The following toning formula has been published in one or two American journals. One recommends it, and says it gives as permanent prints as gold toning; another says that prints toned with it will be quite fugitive. The formula consists of

Hypo	4 ounces.
Lead nitrate	30 grains.
Alum	½ ounce.
Sodium phosphate	10 grains.
Water	10 ounces.

The prints are not washed before toning, and are removed so soon as the desired colour is obtained."

Mr. A. Haddon did not think such prints would last very long.

The Chairman said that Valenta had referred to it, and said that sulphur toning was set up, and that the prints were not permanent.

Mr. Haddon passed round the negative, and prints therefrom, of the group of members of the London and Provincial Photographic Association and the Photographic Club on the occasion of the recent joint outing to Greenwich. In reference to the outing Mr. T. E. Freshwater described the occasion as an enjoyable one, and thought the thanks of those present were due to Mr. Haddon for his kindness in entertaining them. A cordial vote of thanks was therefore passed to Mr. Haddon.

American Plates and Printing Processes.

Dr. Charles L. Mitchell, of Philadelphia, who was present at the meeting, addressed the members on this subject, and mentioned the brands of plates mostly used in America, which he said were comparatively few. The 26 X of the Seed Company about corresponded in rapidity with most of the English drop-shutter plates; the 26 were about fifteen per cent. slower, and the 23 were of medium speed. Cramer, of St. Louis, used to make an immense variety of speeds, the fastest being almost impossible to use. When used properly, however, the results were good. He had since modified his sensitometer, and made three grades, A, B, and C, C being those used for extremely fast work. Mr. Carbutt made three kinds, Eclipse, Special, and B. The B were slow, the Eclipse very fast, and the Special half-way between. There were other makes, such as the Stanley, the Harvard, and the Eagle, the latter becoming quite popular with professionals. In films, Carbutt was perhaps the most successful. As regards printing methods, the most popular method was still albumen-silver, being largely used by professionals and amateurs. Within the last two years collodio and gelatino-chloride papers had, however, made very strong assaults on albumen paper, and had strongly diminished its popularity, a great many professionals using the two first named. The method of treating collodion paper with hot water had obviated its tendency to curl, the prints being just covered with the water, and allowed to remain in it for a few minutes, when the curl was removed. He (Dr. Mitchell) had found that curl decidedly objectionable. Bromide paper was much used for enlarging. Dr. Mitchell incidentally remarked that a 16 × 20 crayon enlargement and one dozen cabinets were supplied by many photographers through the agency of canvassers for as little as 15s., and in reference to the free crayon frauds, stated that the business in them had been, through legal agency, almost broken up. Platinum paper was used for fine work, although to a comparatively limited extent on account of the patent restrictions. There was no doubt, however, that for artistic and exhibition work it was superior to anything else in the way of printing surfaces. As regards methods of working, there was no difference between the two countries. The English photographic journals were very closely scanned by enterprising editors on the other side. He would like to see more uniformity in the size of plates, and would be glad if American and English photographers united on the point, so that there would be no difficulty in getting one's size of plates away from home. He preferred the American lantern size (4 × 3½) on account of the extra room which it gave for titles and comprehensive labels. In conclusion, he expressed the conviction that next year visitors to the Chicago Exhibition would not find the New York Custom House as bad as hitherto; it was nothing like so bad as it was represented.

Mr. R. P. Drage asked Dr. Mitchell if celluloid films were much used in the United States?

Dr. MITCHELL said that for amateur work they were displacing glass. Of course the perfection of the film depended upon the perfection of the celluloid, the preparation of which he described.

Mr. ALEXANDER COWAN asked if Dr. Mitchell could say why the Americans did not, could not, or would not use ammonia in the developer.

Dr. MITCHELL replied that he had been told that American plates would not stand ammonia; American photographers did not like the deep yellow tinge got by using pyro and ammonia. In reply to another question, he said that hydroquinone and eikonogen were used a great deal by amateurs, but that professionals preferred pyro-soda.

Mr. H. SNOWDEN WARD stated that when in New York he had seen the hot water toning method for collodio-chloride paper in operation at Messrs. Anthony's establishment. There was no trouble with curling or buckling, and the prints toned very quickly to a warm purple, although it was stated that practically any tone could be got. There was a richness and beauty about the paper that did not exist here in any paper with enamelled surface.

After further discussion, the CHAIRMAN, in moving a vote of thanks to Dr. Mitchell, which was carried, referred to the specimen gelatine and collotype prints given in the American magazines, which were quite equal to anything produced in England. The photogravures were perhaps not quite so good. Referring to the combined toning and fixing bath containing lead but not gold, he quoted Valenta as saying that the lead kept the whites clear, and caused sulphur toning. Gold and lead toned prints had been exposed to ozonised air, and the latter did not stand very well. In conclusion, the Chairman reminded the meeting of what the Brussels Congress and the Photographic Society of Great Britain had done as to the proposed standard size of plates.

AMIDOL.

Mr. E. W. PARFITT exhibited a small bottle containing some stock solution of amidol, made according to the usual formula. When prepared a fortnight previous, the solution was quite colourless, but it had since turned brown, and considerably slowed in action. The water was not boiled.

Mr. COWAN produced the bottle of solution which he had used for developing twelve plates three weeks ago, and that had not discoloured at all.

Mr. P. EVERITT had prepared some amidol solution with boiling water, and it had not discoloured.

Mr. HADDON had had some of the developer in an open developiug glass for two days, and it had not changed its colour.

Mr. T. E. FRESHWATER had prepared some solution by means of distilled water, and it had not discoloured.

The CHAIRMAN, on the other hand, had found a three weeks' old solution had discoloured, although he had used distilled water.

On the invitation of Mr. DRAGE (the Hon. Secretary), Dr. MITCHELL described the method of conducting American photographic societies, saying that they were, as a rule, more formal than the English societies. For his part he preferred the way in which the English societies were conducted—there was more freedom.

The meeting shortly afterwards terminated.

Hackney Photographic Society.—September 13, Mr. W. P. Dando in the chair.—Mr. SODEAU explained the use of blue glass in the testing of safety of the dark-room light. Messrs. Pollard, Grant, Dean, and Roberts showed work. Mr. Roberts showed some Ilford paper toned with Mr. Welford's bath, and good results were obtained. A lengthy discussion on the exhibition took place, and it was finally resolved that no member should be allowed to compete who has not attended meetings at least four times during the last twelve months. Members were advised to send in a list of proposed exhibits in order as they thought best, so that the hanging committee could be guided in selection. Dr. Colquohoun then gave a short demonstration with amidol. He has used it regularly since August, and was much pleased with it. In cases of under-exposure it was very valuable. Mr. Sodeau exhibited a plate he had developed with it. The exposure was one-twenty-fifth of a second, on a London street, at *f*-11 on a dull day, but it had come out very satisfactorily. Dr. Colquohoun then developed some films, using on the last done a solution of chloride of aluminium, which he said hardened the film to such an extent that it could be washed in hot water.

Putney Photographic Society.—Members of this Society met on Wimbledon Common on Saturday last, and were favoured with lovely weather. Successful negatives were taken of the firing parties at the various ranges, as well as of the golfers who frequent this common in large numbers, and whose characteristic attitudes form good subjects for snapshots. At the invitation of Mr. Faulkner, member of the Council, the party proceeded to his house at Roehampton, where they were entertained. The remainder of the afternoon was spent in photographing in the grounds and palm houses. This was the last of the summer outings of the present season and a worthy finish to the series. The winter season opens on Monday, October 10, when a social meeting will be held in the rooms of the Society in the Charlwood Road, at eight p.m.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—September 15, the last outdoor meeting of the season was held. The party, driving in brakes from Gilsland, visited Birdoswald, Coom Craig, Lanercast Priory, and Naworth Castle. The weather was favourable, and a very enjoyable day resulted. Mr. M. Auty acted as leader in his usual thorough manner.

Correspondence.

PHOTOGRAPHY BY RULE.

To the EDITOR.

SIR,—Mr. Bedding accepts my assurance that I am "unbiassed," although seemingly not "unprejudiced."

I fail to see the difference, and as he again and again makes such assertions, instead of arguing the matter fairly, I should like to make a personal explanation.

In the spring before last my attention was called to the researches of Messrs. Hurter & Driffield, published about a year previously. I gave their work my close study, and was astonished that it had not been brought under the notice of photographers in general. I prepared an abstract of their paper, which you did me the honour to publish.

I found that their theory gave a new light to many photographic problems, and I caused instruments to be made for my own use and for further verification and investigation. This, I submit, was not the action of bias or prejudice; it was prompted solely by the wish to examine, and profit by, the highest scientific researches which had fallen under my notice. Later on, I found that the public were wishful to know the speed of their plates, and, having the necessary instruments at hand, I responded to the demand. I am unwilling to intrude these matters on your readers, but the whole history of my connexion with quantitative photography shows not prejudice, but the reverse, when examined step by step. Had I been prejudiced I should have despised every other attempt to construct an actinometer or exposure table; but I have always approved any sensible effort to guide the young or the occasional worker in the matter of exposure.

Mr. Bedding's central contention is as follows:—"Your measurements of intensity of light, area of diaphragm, speed of plate, absorption of lens, are all subject to error; then why measure at all?" He might as well ask his tailor the same question, and I would give him his tailor's reply. No measurements whatever are free from error, and I have been careful to admit that they are but approximate; but the "judgment" must be "mellow" indeed that can give greater accuracy. "Oh," says Mr. Bedding, "but I can modify my development to suit the case of over or under-exposure; this, too, requires learning, but experience will make you perfect." His argument cuts its own throat. We all know of the clerk whose expertness in "scratching out" prevented his obtaining the situation; so this aptitude in dodging development condemns the "judgment" theory of exposure.

There is, indeed, a seeming paradox, which is a real difficulty to many, the reconciliation of "correct exposure" and "latitude." I can here only touch on the subject as far as it is pertinent to the discussion in hand, as the full exposition would trespass too much on your space. Here is a slow plate, and here is an object of small degree of contrast. Any exposure, in a definite light, between, say, two and *forty* seconds gives an *equally correct* negative. With an object of greater contrast, by adding lighter tints, any exposure between two and *twenty* seconds is equally admissible. With greater contrast of subject, the limits of correct exposure are narrowed, until at last two seconds is the *only* correct exposure. With still greater contrasts the plate refuses to give a correct representation of all the tints of the subject.

As far as I know, from this law there is no escape, and it shows why, and to what extent, an experienced guess may serve the practical requirements of the photographer. The anomalies and contradictions which are thus explained are too numerous for me to refer to; they will readily suggest themselves to any thoughtful reader of the JOURNAL. And this result, of such deep importance, could never have been reached but for the quantitative researches with which I am proud to be, even remotely, associated.

The reason will now be seen why the combined errors of a calculated exposure so seldom throw the result beyond the limits of latitude of the plate, placing the beginner or the *occasional worker* on a par if not in advance of the constant operator, especially when using different types of plates for various requisites.

It is asserted that some plates become faster by keeping; others slower; that a yellow lens absorbs twenty-five per cent. of the light through colour alone. How are these things known, if true? By the exposure proving erroneous. Judgment has been found at fault. The experienced worker has made a mistake.

But by calculated exposures such errors are much more easily traced to their origin, and allowed for in future. Indeed, unless the exposures are calculated, it is rash to say that the speed of the plates has varied, or how much per cent. the lens absorbs.

Mr. Bedding's original paper makes no mention of makers' descriptions of plates. He says it was, *in short*, "by comparing the exposure about to be given with that previously given under similar or different conditions, as the case may be, that experience was gained," leaving untouched the determination of the exposure *about to be given*. Otherwise, by trial and error in exposure, experience is gained; by experience, judgment in exposure is acquired. Therefore, correct exposure is founded on trial and error. Moreover, the conditions of which he speaks are the varying appearance of the focussing screen. Surely, sir, I may conclude with the old adage, "Who will to Cupar maun to Cupar."—I am, yours, &c.,

R. C. PHILLIPS.

The Arts Club, Manchester, September 19, 1892.

[This matter has now been fully dealt with, and here terminates.—ED.]

"COOL WATERS."

To the EDITOR.

SIR,—In your last issue you publish a letter from Mr. Henry Whitfield *re* "Photography and the Illustrated Press," wherein we are accused of describing a picture (published in the *Illustrated London News* o

August 7 last) "as by ourselves," whereas he claims to have produced the negative.

This is the first intimation we have ever had that Mr. Whitfield had anything to do with it, but nevertheless we entirely deny ever having described it as being by ourselves, or in any way suggested or implied the same at any time, notwithstanding our legal purchased right to have done so had we been so disposed.

The facts of the case are as follows:—Some few months since we purchased from Mr. J. Vaughan the business, negatives, and all appertaining thereto, knowing nothing of Mr. Whitfield. Exhibited in the window (where it had been for some years) was the picture *Cool Waters*, with the encloeed printed ticket attached: "Photographed from nature and enlarged by J. Vaughan." A member of the firm of "Ross's" Electrotype Agency, Fleet-street, E.C., inquired whether we had any pictures of a similar nature that they could make use of. We explained that, having only just purchased, we scarcely knew, but would communicate. We submitted several. *Cool Waters* was selected, and a sum offered for *the sole copyright*. We replied that we could not undertake to grant sole right, as we were not aware as to what had been done by our predecessor, who made the negative, but would accept the sum named for whatever right we had in the picture for any purpose they might require.

We heard nothing more of the matter until the picture appeared in the *Illustrated London News*, when we were much surprised and not altogether gratified.

We beg to protest against the manner in which Mr. Whitfield has brought the charge against us without first making some attempt to ascertain the facts.—We are, yours, &c., MORGAN & Co.

119, *Old Christ Church-road, Bournemouth, September* 17, 1892.

To the EDITOR.

SIR,—Referring to the letter which appeared in your last week's issue from Mr. Whitfield, may we say that, as we were instrumental in the publication of the picture in question in the *Illustrated London News*, and as we knew nothing of Mr. Whitfield in the matter, we requested the paper to acknowledge Messrs. Morgan & Co., of Bournemouth, as the photographers from whom we obtained the original, since they were the owners of the picture, and the only persons whose names we knew in connexion with it? This acknowledgment of Messrs. Morgan & Co. was not made at their request, nor with their knowledge, but simply out of courtesy, in our usual form.—We are, yours, &c., NOPS & TARRANT.

19, *Ludgate Hill, September* 20, 1892.

HOW TO GET A GOLD MEDAL.

To the EDITOR.

SIR,—On my return from the seaside I found the enclosed from the Académie Parisienne des Inventeurs. I should very much like to sign my name with a good long tail to it, but not at my own expense; therefore, should you feel inclined to make me a nice Christmas-box, you can do so by following E. Boettcher's instructions. Use the enclosed as you may think proper.—I am, yours, &c., JOSEPH GEORGE HUDSON.

4, *Randolph-gardens, Maida Vale, September* 16, 1892.

[The following is an extract from the invitation which was sent to our correspondent.—ED.]

"PARISIAN INVENTORS ACADEMY.

"*Paris, September* 5, 1892.

"J. G. Hudson, Esq.

"SIR,—We beg to inform you that the Academy has conferred upon you the title of Honorary Member (Membre d'Honneur), with award of the first-class diploma and the great gold medal (gilded).

"This honourable title will be of no expense to you, but if you are desirous to receive the medal and diploma you would have to send us a post money order, to be paid in Paris, of 2*l.* (or bank-notes per registered letter) to cover admission taxes, freight, &c., and we shall send both well packed and free of charge to your address."

The following are the objects of the Academy:—

"1. To contribute to the progress of all which concerns public prosperity.

"2. To discuss the value of the latest inventions and discoveries, and to assist inventors by its influence, its relations, &c., to find the proper ways and means to draw benefit from their inventions and innovations.

"3. To entertain relations to be followed up by a brotherly spirit between all its members."

ACCURACY OF PHOTOGRAPHIC APPARATUS.

To the EDITOR.

SIR,—I read with interest your article on "Accuracy of Photographic Apparatus," as I have lately been suffering from the want of it. I have just returned from the neighbourhood of the Matterhorn, an out-of-the-way part of Switzerland, in a photographic sense, as there were no shops to replace faulty apparatus, or buy anything connected with photography. I had taken with me several packets of cut films, with which I had great trouble, as some of them were cut one-eighth of an inch too small, with the result that they either would not remain in the holder, or else, when the slide was drawn, it was impossible to push it back, and the film either fell into the body of the camera or was crumpled up. I wonder if any of your readers have suffered in the same way. The trouble with the turn-back pin is one from which I have suffered for a long time, and it has always been a wonder to me that the makers do not put a slight depression with a file, or finish off with a swallow-tail instead of a point, in either of which the nail would easily catch. I enclose my card, and am, yours, &c., M.

September 16, 1892.

AFFILIATION OF SOCIETIES' SCHEME.

To the EDITOR.

SIR,—It has appeared to me for some time past that, with the powerful assistance of the photographic Press (which seems to be seldom invoked in vain), the practical usefulness of the host of Societies throughout the United Kingdom might be greatly extended, if some system of reciprocity could be introduced with regard to the use of dark rooms by visitors, and their admittance to meetings, excursions, &c.

Enclosed is a copy of the prospectus and rules of the Cheltenham Amateur Photographic Society, giving particulars of what this Society is willing to offer to the members of any other Society who will give in return such conveniences as they may possess for the use of our members. Visitors should be armed with a card of introduction from their Secretaries, such as I enclose herewith.

To put the scheme into practice, I propose that the Secretaries of such Societies as are willing to throw their premises open to all other Societies who reciprocate, should write to me, giving particulars of the conveniencies which visitors may expect to find there. These Societies would then be classified, and I would send a full list to the photographic journals. All the Secretaries interested would then be put in possession of the fullest particulars of the resources of each Society affiliated. A system of freemasonry would thus be initiated, which could not fail to make the practice of amateur photography still more pleasant and fascinating. Most of us, when visiting a strange town, will appreciate the advantage of being able to change plates, and possibly develop, without fuss or favour, to say nothing of the introductions to local amateurs, in a position to give much useful local information and assistance.

I cannot but think that, if this idea be carried out, and, perhaps, enlarged upon later, it must prove of general benefit, and, perhaps, do something towards preventing the disappearance of some of those Societies which are missed from our midst from time to time.

I see no reason why such affiliation should be restricted to British Societies only; for instance, will Chicago Societies reciprocate? Perhaps members of Societies will draw the attention of their Secretaries to this letter, and urge action? Thanking you in anticipation, I am, yours, &c., PHILIP THOMAS,

Secretary, Cheltenham Amateur Photographic Society.

Bath-road, Cheltenham, September 17, 1892.

EXETER AMATEUR PHOTOGRAPHIC SOCIETY'S EXHIBITION

To the EDITOR.

SIR,—We are arranging an exhibition for the last week in November, full details of which will appear later on. It will be open to all, amateurs and professionals, but the former only will be eligible for the competitions. If you will kindly give publicity to this, we shall esteem it a great favour.—I am, yours, &c., JOHN SPARSHATT, *Hon. Secretary.*

Fairfield House, Alphington-road, Exeter, September 18, 1892.

HACKNEY PHOTOGRAPHIC SOCIETY EXHIBITION.

To the EDITOR.

SIR,—This Exhibition will be held on Tuesday, Wednesday, and Thursday, November 15th, 16th, and 17th, 1892, at Morley Hall, Hackney. The judges will be, in all probability, Captain Abney, F.R.S., &c., and Messrs. Ralph W. Robinson and J. Gale. The open classes will be: 1. Stereoscopic; 2, Portraiture and Genre; 3, Lantern slides; and, 4, Landscape. Entry forms will be ready by next week. Application for space for apparatus, &c., is required as early as possible.—I am, yours, &c.

September 19, 1892. W. FENTON JONES, *Hon. Sec.*

BIRMINGHAM PHOTOGRAPHIC SOCIETY.—September 27, Social Meeting. October 4, *Manipulation of Gelatino-Chloride Paper*, by Mr. E. Underwood. 11, *Self-help for Amateurs*, by Mr. W. B. Osborn. 18, Prize Slides. 25, *Lantern Slide Making*, by Mr. E. H. Jaques. At some subsequent date it is proposed to have a lantern display of subjects taken on excursions during the last season.

THE Thornton-Pickard Manufacturing Company announce that they have completed the erection of their new factory and offices at Altrincham, near Manchester, and that the whole of their business will be transferred to the new premises from September 24, after which all communications should be sent to the new address. The factory has been designed and built expressly for the manufacture of the Thornton-Pickard specialities.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," 2, *York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & CO.," 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

Goodwin Thorley, Long Eaton.—*Photograph of Long Eaton Waterworks, with group in front of building.*

J. Bell, Frome.—*Photograph of the interior of St. John's Parish Church, Frome, Somerset, and of the high altar of St. John's Parish Church, Frome.*

W. GRIFFITHS.—Thanks; the date named will do perfectly well.

CAPTAIN J. HOPE.—The scratches may be removed from the surface of ebonite by polishing.

W. S. VEDDIE.—Abney's *Instruction in Photography* would probably suit your purpose.

J. D. TRINGROVE (Peterborough).—By reproducing or selling the picture you render yourself liable to prosecution.

RECEIVED.—*Dry Plates*, edited by Cadett & Neall; *The Hand Camera, and How to Use it*, by Walter D. Welford. These and others in our next.

TWO YEARS' SUBSCRIBER.—If you write to Messrs. Newman & Guardia, Farringdon-road, E.C., they would give you the information required.

F. W. BOCKEN.—We should think that the light from either a coal or coke fire, if it gained access to either sensitive plates or papers, would fog the pictures.

SERGEANT-MAJOR.—We presume there would be no objection to your taking photographs in Kew Gardens while wearing your uniform, provided you have the ordinary permit to photograph in the gardens and houses.

C. BREWER.—It is tolerably well known that the xylonite dishes are not adapted for holding methylated spirit, inasmuch as that material is soluble in it. You now see the reason why your tray has "come to grief."

STELLA.—The minute transparent specks on the negatives arise from dust on the plates. Before putting them in the sheaths, carefully dust them with a broad camel's-hair brush. Also, well dust the inside of the apparatus.

R. A. J.—If the enlargement has turned yellow in less than three months, we should say that you would be perfectly justified in returning it to the maker for replacement, in the same manner as your customer has done to you.

A. E. BAILEY (Hon. Secretary, Leytonstone Camera Club).—The notice of your exhibition was crowded out last week. We are sorry we cannot undertake to distribute the entry forms. Terms for advertising have been sent you.

REV. DR. R. O. DAVIES.—1. At p. 783 of the ALMANAC for 1892 the formulæ of several hypo eliminators are given. 2. *Hot* water would obviously not answer for a printing-out paper in which gelatine is employed as a vehicle.

B. A. S.—A lens with an aperture of *f*-6 will be quite quick enough for out-door work with a drop shutter, in an average light, with plates of extra rapid kind. With a little practice, a whole-plate camera can be used successfully as a hand camera.

T. BLOOM.—If your query was not replied to it was because you did not append your name and address: consequently the letter was consigned to the waste-paper basket. Repeat your question. The answer can appear under initials or a *nom-de-plume*

W. A.—From your description we think that if the negatives were placed in a clearing solution, say a saturated solution of alum with an ounce of hydrochloric acid to the pint, for an hour or two, they might become printable. Try with one or two.

H. W. KEAST.—Your employer will have to pay your full salary up to the time that the notice expires. Unless there was an agreement to that effect, he is not bound to pay your fare back. If you summon him, and gain your case, the Court will allow you costs.

H. C.—Without an analysis it is impossible to say what is the cause of the spots which appear after mounting. There are many other causes of spots than bronze powder. Better place some of the prints and some of the mounts in the hands of an analytical chemist for examination and report.

S. S.—It by no means follows that because albumenised paper has an offensive smell it is prepared with blood albumen, though such is, to a certain extent, a popular fallacy. Notwithstanding that the paper you are employing "stinks abominably," it may be prepared with nothing but whites of eggs.

D. SUCH.—The blurred effect on the windows is halation. If the plates had been backed, as all plates should be that are used on interiors, the trouble would be avoided. As the negatives have to be taken again of a different size, back them by any of the well-known methods, and good results will be obtained.

T. WORLEY.—The best way we know of cleaning the gelatine films from old negatives is to soak them in cold water for a day or so, and then immerse them in hot water. Hydrofluoric acid may be employed, but it is very unpleasant stuff to use. We should recommend the purely hydropathic treatment.

A. H. DE ATH.—The markings are clearly due to the manipulations. They are entirely on the surface of the print, and some of them are decided finger-marks. By treating the print with a sponge and cold water the whole of the marks were removed, and the surface left perfectly clear and bright. The picture apparently has been over-toned.

A. SIMMONS.—The mere registration of a picture at Stationers' Hall does not thereby confer copyright, unless the Act has in other respects been complied with. In the first place, did you receive pay, and were you authorised in writing by the sitters to copyright their portraits? If you have complied with these conditions, you have a clear case against the pirates.

MR. WILSON NOBLE, M.P., writes: "Can you tell me where the hypo and meta-bisulphite cartridges mentioned by Miss Ethel Constance May are to be obtained? Anything that gets rid of the nuisance of weighing hypo must be a boon."—So far as we are aware, the cartridges are not articles of commerce in this country. They are, we believe, used in Austria and Germany.

BELLA.—Immersing albumen prints in a strong solution of alum after they are taken from the fixing bath will not prevent blisters. The treatment the print has been subjected to will fully account for its stained and yellow appearance. Blisters may be avoided by immersing the prints when they are taken from the frame, prior to washing, in methylated spirit. This preventive has never failed in our hands.

EXPAND says: "I have mounted a number of platinotype specimens on good platinotype mounts, gold bevel edge, and exposed them in my window uncovered. The flies have spitted over them nicely, and unless something will remove these spots, prints and mounts will be useless. Have tried cold water and sponge. Can you tell me what will remove this trouble without spoiling surface of mounts or prints?"—If a sponge and cold water will not remove the trouble, we know of nothing that will. Prints of this kind should always be protected by glass, particularly at this time of year.

OTHELLO writes as follows: "I have found a great difficulty occur in my use of the new gelatine printing papers. It is the spotting. In the rush of business I cannot afford to take them from the washing water and dry before spotting. This might answer, but I always prefer to squeegee them direct on collodionised glass. (I invariably use collodion on the surface to protect from future moist and dirty fingers.) I have spent several shillings in mediums, &c., that are supposed to dry bright, but in my hands they have all failed, leaving unmistakable evidence of their application on the collodion surface. I fancy I have heard or read of a formula for a spotting medium that contains gum senegal, which could be used on the collodion surface without disfiguring it. If you or your readers could give me any information on this subject, I should be greatly obliged."—Perhaps some of our readers will assist "Othello" in his difficulty.

THE new address of the Liverpool Amateur Photographic Association is Percy-buildings, Eberle-street, Liverpool.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—October 4, Lantern Night. 18, Technical Evening. Nominations for Council and officers for ensuing year for election at Annual Meeting. November 1, Annual General Meeting.

THE London agency of Messrs. Walter Griffiths & Co., of Birmingham, has been placed in the hands of Mr. L. E. Morgan (late of the Fry Manufacturing Company), to whom communications should be addressed at 5, Agar-street, Charing-cross, W.C.

THE Leigh Photographic Society are to have a lecture room and dark room in the new Technical School at Leigh, the foundation-stone of which was laid on the 10th inst. by the Hon. L. Powys. The first annual meeting of the Society will be held on the 29th inst.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—September 29, *A New Gelatine Emulsion for Lantern Slides*, by Mr. G. T. Harris, with specimens. 24, Outing, Hadley Wood. October 6, *Various Printing Processes*, by Mr. B. Foulkes Winks.

MR. W. D. WELFORD informs us that he has received from the Secretary of the Queen of the Belgians a kind letter, in which he is instructed to express Her Majesty's great admiration of Mr. Welford's Belgian street scenes, taken with a hand camera, in the use of which Mr. Welford is known to be proficient.

IN connexion with the evening classes of the City of London Young Men's Christian Association, Mr. B. Foulkes Winks is to give, commencing with the evening of Thursday, September 29, a course of instruction in Photography, and will be happy to forward tickets of admission for the introductory lecture on the above date.

THE PHOTOGRAPHIC CLUB.—September 28, *The Object of Photography*, by Miss Catharine Weed Barnes. October 5 first Lantern Night of the season; slides from negatives taken during the Edinburgh Convention meeting. Outing, Saturday next, September 24, Hadley Woods; meet at High Barnet Station between two and fifteen minutes past two.

WE have received the calendar and syllabus of the evening classes in connexion with the People's Palace Technical Schools. The elementary and advanced courses of Technical Photography are under the direction of Mr. Charles W. Gamble, the instructor in Retouching being Mr. Wolfgang Arndt. The syllabus of these two courses is set forth in such detail as to leave no doubt that the subject is fully dealt with in all its many departments.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

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THE PHOTOGRAPHIC EXHIBITION.

The Exhibition of the Photographic Society of Great Britain serves as a watch-tower from which, year after year, we may note the advances that have been made. It was on this, as on former occasions, formally opened by a soirée which was numerously attended by members and friends, some of whom had travelled great distances to be present. They were received by Captain Abney, F.R.S., President of the Society, and Mrs. Abney, together with some of the members of Council.

The crush, not usually accounted unpleasant, was as great as ever, and the accustomed query, "Is the show up to the average?" received an emphatic affirmative response, one member's inquiry as to what his interlocutor thought of the "Shipwreck" being received with the smile of confidence which the irony demanded. Indeed, so great was the number of pictures sent in, that about one-third of the whole was of necessity rejected. We think we are correct in saying that the verdict of the Judges has on the whole met with general approval, though in one or two particular instances it was suggested that a bestowal of awards in another direction might have been justified on the merits of the case.

The first thing noticeable in the Exhibition is the variety of tones which the pictures present. While ordinary platinum tones still hold their own, there are a greater number of sepia prints than on any previous occasion. We have several times spoken of how well this colour lends itself to the production of photographs on rough-surface paper. Carbon printing, which during the last and preceding year seemed to be lagging behind, is, we are glad to see, here to the front in considerable force.

Technical merit had some years since taken such a high place as to leave but little room for any great advance being made; but it is gratifying to find that photographers have gone with a steady aim at improving the art qualities of their exhibits; indeed, it may fairly be said that in this respect the present Exhibition shows an advance on all previous ones. We observe, as conspicuous by absence, very few illustrations of snap-shots taken by hand cameras. We have heard that several were sent in, but that, possibly from want of wall-space or from intrinsic demerits, the Selecting Committee had to leave them out. Let us hope that in another year, by which time it is expected that the present Exhibition room will not be at the service of the Photographic Society of Great Britain, another both larger and better-appointed gallery will be secured, and also in virtue of greater art experience, it will not then be necessary to say, as on the present occasion, that such a large percentage of all the pictures sent in were reluctantly unhung.

The newspaper press has, with perhaps a solitary exception, spoken of the Exhibition in highly favourable terms. That exception is the *Times*, a perusal of its article instantly establishing the fact of the absence of its quondam skilful and, scholarly critic (Sir Henry Trueman Wood), whose able descriptive and critical remarks in former years stand out in all the brighter and bolder relief on account of his absence.

The lantern transparencies this year, both in tone, gradation and composition, are of a high order of merit; but it is to be regretted that the exhibition of lanterns themselves and other lantern appliances is so sparse. This regret extends to all the mechanical section. The quality, however, in this department is so good as to somewhat make amends for the paucity of exhibits.

With the few exceptions above enumerated, we are happy to recognise in the present Exhibition qualities which compel us to regard its future with unalloyed confidence. The critic we have already noticed is pleased to decry the art merits of the Exhibition, but the refutation of such an interested disparagement will be apparent to all who will give an intelligent inspection to the pictures on the walls; for we take leave to say that the progress of art photography is not dependent upon the productions or good countenance of two or three workers having not generally recognised views on the focal treatment of subjects; and, as for the fact of their abstention from such an Exhibition as that under review having anything but the smallest influence in any respect, the idea is too absurd to be entertained.

To sum up, the current Exhibition of the Photographic Society must be set down as an unqualified success. Portraiture ranks as highly as ever in its two dominant schools of touched and untouched work, while the treatment of landscape work, in its different varieties of focal and tone renderings, provides a diversified display which, while it may give rise to animated discussion, above all attests the marvellous and constantly expanding powers of photography in transcribing nature in all its illimitable phases. Architectural photography, interiors, the scientific applications of photography, photo-mechanical work, humour, composition, and a laudable degree of technical skill, find the highest forms of treatment in the Exhibition, the uniform success of which we are sure will constitute a landmark, both in the history of photography and of the Society which has gathered it together.

RESTORING FADED ALBUMEN PRINTS.

THERE are few of our readers, we imagine, who have not in their collection of photographs some which have passed or are passing into the "sere and yellow" stage, and in a great many instances, no doubt, the means of restoring a valued portrait to its pristine condition, or of saving it from getting worse, would be welcomed, if such were available. It is quite true such methods do exist, but they are only to be relied upon in the most skilful hands, and at best give but an unsatisfactory result.

The most familiar of the old-fashioned methods consists in treating the print with bichloride of mercury, and afterwards with one or other of a variety of substances familiar to the worker of dry plates in connexion with mercurial intensification, the process of restoration being, in fact, almost identical with the latter. By treatment with the mercurial salt, the faded or yellowed image becomes further bleached, and apparently almost destroyed, owing to the conversion of the silver, of which it is chiefly formed, into a white or nearly white chloride; but the application of a second solution, say, of very weak hypo, again darkens it by conversion into a sulphide in which silver and mercury exist together, and which form a vigorous and not altogether unpleasing image.

The colour of such converted images is, however, invariably of a brown tone, though it is not easy to secure with certainty any particular tint that may be desired, and the result is as likely to be unsatisfactory as not, more especially in these days, when brown tones are not universally admired. Besides which, a strong prejudice exists against the use of mercury in this manner on account of an imaginary want of permanency of the restored image. This suspicion is, however, so far as we know, entirely ungrounded; for if the print be properly treated, that is to say, carefully washed between the various operations, the resulting image may be relied upon as consisting of an almost unchangeable compound, while the whites of the picture are at least in no worse condition as regards liability to discolouration than they were before the treatment.

A similar process, and one which possesses advantages over the mercurial method, though it has not, we believe, been generally applied to this purpose, consists in the substitution of perchloride of copper for the chloride of mercury in the primary bleaching of the image. This acts in a precisely similar manner, converting the silver image into one of compound chloride of silver and copper, which is amenable to the same modes of after-treatment as the one composed of mercury. But the preferential plan of reduction, when the cupric chloride is used, is to apply one of the ordinary developers used for dry plates, only taking care that it is considerably diluted and restrained, and of such a nature as not to stain the paper. In this manner a very considerable variety of tone may be obtained, both by changing the developer and by varying its strength, and the process is free from the unfortunate suspicion of want of permanency that attaches to the method just mentioned.

A serious drawback to the use of the copper salt is found, however, in the persistency with which it clings to the print, not only in the soluble condition in which it exists in the solution, but also, it is to be feared, in an insoluble state, or nearly so, as cuprous chloride, which, though colourless, or nearly so, in itself, is subject to reduction on the subsequent application of the developer, and so causing discolouration of the whites of the print. This danger is minimised by slightly acidifying the bleaching solution with hydrochloric acid, which prevents the formation of the subchloride, and by copious and careful washing of the print after treatment, under which conditions no discolouration of the whites will occur.

When the details of the copper process are carefully and intelligently carried out, it is possible, as already stated, to secure a great variety of tones, from warm to neutral black, though, perhaps, it would be inaccurate to claim that any individual colour can be secured or repeated with absolute certainty. We were at one time of opinion that the colour might be varied by giving the bleached print a more or less prolonged exposure to light before reduction, so as to produce the same effect as is obtained by varying the exposure of chloride prints; but a more careful scrutiny of the results obtained have convinced us that the presence of copper in the bleached and nearly invisible image altogether upsets the reliability of any such expectations.

What is really required, then, would seem to be a method by which the image can be converted into pure silver chloride, or, at least, silver chloride, without the presence of any other reducible metal. Fortunately, this is a very easy matter, for we have only to substitute for the bleaching solution already mentioned one containing a soluble chloride and a little free chromic acid, or, what amounts to the same thing, a solution of bichromate of potash to which is added some common salt and a few drops of hydrochloric acid. When such a solution is used, the silver composing the image is converted into chloride, and beyond a deep yellow stain which pervades both the albumen film and the pores of the paper, caused by the bichromate, no other impurity remains. This stain is, however, easily and quickly removed by simple soaking in water if the print be kept from exposure to strong light, and the image may then be supposed to consist solely of chloride of silver, with the slight exception that will be referred to presently.

In speaking of the image, we have treated it as consisting solely of metallic silver, or some organic compound completely acted upon by the various bleaching solutions; but theoretically, in the case of a faded image, it should be composed, at least partially, of a sulphur compound of silver, to which it owes its yellowness. That the compound cannot be ordinary silver sulphide, or, if it is, that its quantity must be extremely minute, is evident from the behaviour of the bleaching solutions, for, while sulphide of silver is one of the most difficult substances to act upon, the yellow faded image is almost entirely removed by all of the solutions named above. The precise appearance of the print after bleaching will vary very materially with its condition before that operation, slightly in proportion to the degree of fading, but very considerably according to the original tone, that is to say, to the quantity of gold present. A vigorous purple-black toned print will leave, after conversion into chloride, an image of a greyish or slate colour which, after a very prolonged immersion in the chromic solution, almost disappears; the more fashionable red and brown-purple tones, carrying less gold, the image after bleaching is scarcely visible as a faint dirty yellow. That the substance forming the faded portion of the image is acted upon by the bleaching solution is shown by the fact that the very worst cases of fading exhibit scarcely, if any, difference in appearance after treatment from perfectly fresh prints of similar vigour. Therefore, we repeat, the image left by the chromic solution may be considered as practically pure chloride of silver, *plus* the very small quantity of gold added in toning.

But "faded" prints, in addition to the change of colour of the material forming the image, are usually marked by a distinct yellowing of the whites, which are frequently merged into the finer half-tones. The colouration of the whites, where, indeed, it is not mere yellowing of the paper from age, must arise from the results of carelessness in allowing traces of the fixing solution to remain in the prints, and such, as has over and over again been shown in these columns, contain sulphur compounds of silver. It would seem, therefore, that in treating in this way a print the whites of which are badly yellowed the only result of the "restoration" would be to convert the yellow colour into a decided deposit of silver of the same colour and character as the actual image, and consequently to considerably degrade the lights. Such an effect is often obtained when employing the mercurial or copper bleaching solution, but we have not found it occur when chromic acid is employed, from which we infer that that solution in some way removes or renders soluble the matter causing the colouration. Certain it is that mere discolouration of the paper, if not of too pronounced a character, is completely removed by the bleaching action of the free acid.

In fact, from a faded albumen photograph of the worst type the chromic solution, of which we shall give a formula, will remove every vestige of colouration except the scarcely visible traces of the image already spoken of, if the print be carefully and copiously washed after treatment. In this condition it only remains to select the most suitable reducing agent to reproduce the tone desired, and in making this selection it is well to bear in view the extent to which exposure to light is to be allowed to play its part.

By rapid development with a comparatively strong developer the same class of neutral black tones is obtained as with gelatino-bromide and chloride papers, while, by greatly diluting the reducing solution and exposing the bleached print to light more or less, an image is produced of the tawny-brown colour familiar with the old "Alpha" paper, and which is capable of being toned with gold to almost any colour.

It must be borne in mind that nothing but injury can accrue from exposing the print to strong light until the whole of the bichromate has been removed, because, while the chromic salt is liable to reduction, rendering the stain permanent, its presence entirely destroys the sensitiveness of the silver salt as such. Therefore, in taking advantage of the light's action, the exposure should only be made after the complete removal of the bichromate from the print.

Photo-mechanical Work.—In the Printing Trades Exhibition, which has been open for some little time, and closes to-morrow, at Islington, it is noteworthy that no special appliances in connexion with photo-mechanical printing are shown. There is not a single example of a hand collotype press, or a power machine, or a Woodbury press shown, although several Continental firms are represented. Neither are several other appliances which are made specialities of abroad shown, although they would have been interesting to English workers, and might have led to business. With the exception of a few collotypes and Woodburytypes, by one firm only, we think photo-mechanical work even is not represented. Possibly Continental manufacturers of the necessary appliances do not think the British trade in them worth cultivation, and few, if any, English makers have taken the matter in hand.

Collodio-chloride Paper.—Emulsion papers for direct printing now seem to be becoming the order of the day. Both collodio-chloride and gelatino-chloride papers were for a long time made on the Continent and imported into this country, but for some years their use was very restricted in England. It was not until one or two enterprising firms here took up the manufacture of gelatino-chloride paper that its employment became extended to its present proportions. Now collodio-chloride paper under different names is still being made abroad, and imported into this country; but, so far as we are aware, it is not made commercially here. It is quite probable that, if its manufacture were established here with the same enterprise—and for that matter by the same firms—as was the gelatino-chloride paper, it would be in considerable demand. The collodio-chloride process is a much older one than its rival, but its results are by no means inferior. We are in possession of some excellent prints that were made over twenty years ago. If we mistake not, the process has been in constant use by a well-known professional photographer in Scotland for about that period.

Varnish for Celluloid Negatives.—We are often asked for a formula for a varnish for negatives on celluloid films that will not attack the celluloid. Here is one that answers well in our hands:—White lac, or pale orange lac, four ounces; methylated spirit, eight ounces. When dissolved, add liquor ammoniæ, six ounces, and boiling water half a pint, and afterwards a drachm and a half of glycerine This solution may be filtered, or it may be allowed to stand and settle and the clearer portion decanted. It will generally have a somewhat opalescent or turbid appearance, but that may be disregarded, as it will not affect the negative. The mode of using is this:—After the negative has been fixed and washed, it is thoroughly drained. The varnish is then poured into a dish and the negative immersed and allowed to soak for a few minutes. It is then taken out and pinned by one corner to the edge of a shelf or other convenient article to dry. This varnish will also answer for negatives on glass, and it may be applied while the film is still moist; but, on the whole, for glass negatives a good spirit varnish is to be preferred.

The Compound Fixing and Toning Bath.—In our issue of last week appears an article from the *Beacon* with the somewhat startling heading, "The Alleged Fading of Silver Prints." In the article the writer makes a strong plea for the more general use of the old fixing and toning bath, as employed a few decades ago, which he says has unnecessarily been condemned as a system of sulphur toning. In doing so, however, he overlooks the fact that a recurrence to the old method is impracticable, at least under the present condition of things. To work under that system, we should have to entirely alter the character of our negatives, and make them like the intense ones of old. The paper must also be much more heavily salted, and have a far less albumenised surface than that now in vogue. Then, again, it would have to be sensitised on a bath of nearly double the strength of those in general use. Unless these conditions be fulfilled, the rich black and purple tones so frequently spoken of in connexion with old photographs are impossible. Let any one try the old system of toning with the modern highly albumenised, and weakly sensitised, paper, on prints from the present standard negative, and see the result. If we were to go back to the old conditions, then we should doubtless find that the modern system of toning and fixing would still give the most permanent results.

Reproduction of Photogravure Plates.—It is pretty generally known that many negatives, from which large numbers of copies are required for publication, are not printed from at all. A transparency is taken, and from it several other negatives are made. By this system printing is facilitated, and no risk is run with the original negative. A similar system is now being followed in some Continental establishments with photogravure plates. Although "steel facing" enables a large number of impressions all of equal quality to be obtained from a plate, and, when the steel facing wears through it can be easily removed and a new one substituted, so that, theoretically, the plate will last for ever, yet, when it is of a popular subject and a large number of impressions are known to be required, or they are wanted quickly, it is often reproduced. When the plate has been worked up by the engraver, and is finished ready for printing

from, an electrotype is taken from it, and from that any number of duplicate plates, all in every way equal to the original, can be made. Except for electrotype such a thing would be impossible. In connexion with this subject, it may be mentioned that the engraved plates of maps made at Southampton are never printed from except to make transfers for zincographic printing.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

The Exhibition of the Photographic Society of Great Britain was inaugurated on Saturday evening last, September 24, by a *conversazione*, at which the President (Captain W. de W. Abney, C.B., F.R.S.) and Mrs. Abney, assisted by the members of Council, received the invited guests. The attendance, which was thoroughly representative of all sections of photography, included Mr. J. Spiller (Vice-President) and the following members of Council:—Messrs. W. Ackland, G. L. Addenbrooke, W. Bedford, W. S. Bird, F. P. Cembrano, jun., W. E. Debenham, W. England, Colonel J. Gale, Dr. G. Lindsay Johnson, A. Mackie, J. Traill Taylor, Leon Warnerke, H. Chapman Jones, &c. Among the general company we noticed Miss Catharine Weed Barnes, Miss Carey, Miss Taylor, Mr. G. Mason (President elect of the Photographic Convention of the United Kingdom), Mrs. Mason, Mr. G. W. Webster, Mr. F. C. L. Wratten, Mr. Perigal, Mr. F. A. Bridge, Dr. J. J. Acworth, Mr. F. W. Hindley, Mr. T. P. Watson, Mr. W. H. Prestwich, Mr. W. J. Byrne, Mr. E. Clifton, Mr. H. E. Davis, Mr. Redmond Barrett, Mr. E. W. Foxlee, Mr. E. Ferrero, Mr. J. W. Marchant, Mr. H. Bedford Lemere, Mr. A. L. Adams, Mr. H. Smart, Mr. E. W. Parfitt, Mr. and Mrs. J. Hay Taylor, Mr. A. I. Taylor, Mr. T. Charters White, Mr. C. W. Gamble, Mr. A. W. Dollond, Mr. G. Houghton, Mr. T. E. Freshwater, Mr. R. P. Drage, Mr. P. Everitt, Mr. S. W. Rouch, Mr. S. T. Chang, Mr. E. J. Wall and Mrs. Wall, Mr. W. D. Welford, Mr. C. W. Hastings, Mr. T. C. Hepworth, Mr. T. Bolas, Mr. H. Snowden Ward, Mr. C. G. Norton, Mr. H. H. Griffin, Mr. Conrad Beck, Mr. H. R. Hume, Mr. J. A. Sinclair, Mr. G. W. Atkins, Mr. Frank Haes, Mr. N. A. Monnickendam, Mr. P. H. Newman, Mr. R. Child Bayly (the Assistant Secretary), and many others. During the evening considerably over four hundred guests responded to the Council's invitations, a number which is nearly a hundred in excess of last year's attendance.

The total number of exhibits is 693, being a decrease as compared with last year of fifteen. The falling off, however, is not in the pictures, but in the apparatus section. It may be of interest here to note that the 600 or so pictures actually hung represent only two-thirds of the number submitted, the gross total being, we believe, one of the largest ever sent in to the Society. The number of exhibitors is 202 (as against 185 last year) of which 64 are members of the Society. This calculation excludes several exhibits in the names of firms, the principals of which are in many cases members. Roughly speaking, the proportion of members to non-members among the exhibitors is about 1 to 3. Last year between seventy and eighty members were exhibitors. The Society, we believe, has a membership of over 400. For the exhibition of 1891 the Judges distributed eight medals, which, it was generally allowed at the time, were most wisely bestowed. This year, in a mysterious outburst of juridical generosity, no less than seventeen awards have been made.

Regarding the Exhibition as a whole, this somewhat lavish distribution of medals points directly to the inference, on the judges' part at any rate, that the average of quality, as compared with former years, is very high. In this view, we ourselves are inclined to participate, while we congratulate the Hanging Committee, who have placed little or nothing on the walls that the most fastidious critic could carp at, The Exhibition strikes us as particularly strong in landscape work. notwithstanding the absence of such men as J. P. Gibson, Horsley Hinton, Wellington, Ralph Robinson, and others. In portraiture we have seen few better displays. *Genre* and composition pictures are few and effective; the photo-mechanical exhibits are remarkably fine; the scientific subjects, though not numerous, are deeply interesting; but undoubtedly the strength of the Exhibition lies in its landscape work. It is not a one-picture Exhibition; so that "the picture of the year"—"the gem of the Exhibition"—is not obvious. Perhaps this fact, more than any other, will serve to emphasise the high average of excellence displayed. For the rest, the dominant tone of the pictures is a decidedly, and most agreeable, warm one, the reds and sepias giving more colour to the walls than we remember to have noticed before at a purely photographic exhibition.

The Medal Pictures.

Mr. Karl Gregor deservedly receives a medal for a series of five pastoral subjects, and a *Thames Sunset* (No. 5). The former are charming studies of sheep life; bright, crisp, perfectly lighted and exposed, and most carefully printed. In *Homeward* the flock is seen proceeding along a country road, and the realism of the picture is heightened by the cloud of dust above the sheep.

Mr. B. Gay Wilkinson also gains a medal for a series, of which *Westminster* (No. 50) is a silhouette-like view of the Houses of Parliament, taken from St. Thomas's Hospital, with the bridge just visible. He also sends (No. 48) *The Estuary of the Blyth*, (No. 49) *A Sunset Calm*, (No. 51) *The Peaceful Evening Hour*, (No. 52) *Where Tempests Beat and Billows Roar*, and (No. 53) *The Silver Strand*. In his twilight and sunset effects Mr. Wilkinson is very successful, No. 51 being most idyllic and poetical. *Westminster*, however, to our thinking, would have done with a little more detail. At present it is far too sombre in general effect. The series is printed on sepia-toned platinum paper.

It is a pity that Mr. W. Bedford should have chosen such unsuitable frames for his fine Norfolk series, Nos. 65–72, the contrast between the brown colour of the frames and the sepia tones of the carbon pictures being almost fatally narrow. Mr. Bedford is peculiarly happy in the management of his lights and reflections, the view of *Salhouse Dyke* (No. 67), the medal picture, being most successful in those respects. Alike in selection and treatment the series is a masterly one.

Colonel J. Gale's medal for a series is most justly earned. The rising mists of the *Incoming Tide* (No. 79) and *Towards Sundown* (No. 82) are very cleverly rendered, while a *Cottage Doorway* (No. 80), with a view of the interior, is a good example of a well-exposed picture. No. 85, *The Cornfield*, is one of those rustic subjects which this artist has for years made his own. An *East Country Quay* (No. 83), a delightful riverside study, in which the clouds are ably caught. In No. 81, *Flatford Bridge*, the handling of the water and the reflections are very clever. Colonel Gale has seldom sent better work to any exhibition.

Mr. A. R. Dresser receives a medal for (140), a softly printed view of Aylesford; but this is as well as Mr. Dresser's other two uranium-toned bromide pictures (No. 139), the *Meeting of the Conway and Lledr Rivers*, the turbulent waters of which are well suggested; and (No. 141), a stormy-looking *Evening*, are not free from several technical defects which surely should not have escaped the attention of the Judges.

As an example of successful child portraiture, in which the facial expressions of the small sitter are capitally expressed, Mr. H. Yeo's delicately printed series in platinum of *Blowing Bubbles* (No. 143) and *A Portrait* (No. 144) deserve the recognition they have gained. They are clever, unaffected, unforced little studies.

Mr. F. Muller's "*Portrait*" (No. 146) is a magisterial work, the wrinkles and locks of age, the bent head, the expression of venerable dignity on the face, being worthy of Herkomer at his best.

Worn Out (No. 184), by J. E. Austin, is a rich, warm-toned picture of an old fellow examining the works of a clock with critical interest. This and its companion picture (No. 185), the same subject surveying with consternation an *Account Rendered*, were both taken direct with a spectacle lens.

Mr. H. Stevens receives a medal for (No. 201) *Meadow Sweet*, a tenderly treated study. The same gentleman exhibits (No. 199) a forcible *Pack of Beagles*, and (No. 200) *Foxgloves*, (No. 202) *Coleus and Begonia* (a fine subject finely photographed) and (No. 203) *Addlestone Lodge in Winter*. The flower studies are in Mr. Stevens's best style.

Mrs. Main, in (No. 212) a series of six transcripts of Alpine *Frost and Sunshine*, repeats her success of last year. The gradations of the frost and snow in the clear Alpine light are well preserved, and, as examples of careful platinum printing, the series is very good. We must not omit to compliment this exhibitor upon her quiet but refined taste in mounting and framing.

Mr. J. Harold Roller is a prolific exhibitor this year, but shows nothing better or more clever than his frame of four *Direct Portraits taken in a Room*, for one of which a medal has been given him. This one—a lady seated in a large chair a little way back from a window—is perfect in lighting, modelling, and pose, while the remaining three, also similar studies, are remarkably fine. Mr. Roller gives evidence of being a most painstaking worker.

The carbon enlargement (No. 250)—*Break, break, break, at the Foot of thy Crags, O Sea*—for which Messrs. Elliott & Son receive a medal—is in many respects the most noticeable picture in the Exhibition. Its size is seven feet by five feet, and it is from a whole-plate negative by Mr. Birt Acres. It is, without doubt, a majestic work. From a placid sea the white crested waves tumble in upon ridges of ugly jagged rocks in the foreground, the seething, surging waters almost sounding in one's ears. The particular pigment employed adds to the fine effect of the study, which, in addition to its artistic value, is a splendid specimen of carbon work. It should, however, have been hung higher.

Mr. F. Boissonnas sends a large view of *Mont Blanc* at a distance of fifty-six miles, "taken with a Dallemeyer telephoto lens, with an extension of camera of 60 inches, 7 minutes' exposure, at 6.15 on the 27th of August, in windy weather, with an orthochromatic plate, and a yellow screen." Even allowing for the most favourable circumstances, this is a wonderfully fine picture, the definition and gradation being unexceptionally good. Accompanying the pictures are three very small views, giving the same view with an ordinary lens; another from Geneva with an ordinary lens (distant forty-four miles), and what the exhibitor calls a "conventional" print, with the mountain showing, such as is sold to "strangers" in Geneva.

The Autotype Company receive a medal for an autogravure reproduction of a painting of *Young England*, by Mr. Edwin Douglas, exhibited at the Royal Academy earlier in the year. This is a study of mares and foals, and those who saw the original at Burlington House will appreciate the excellence of the reproduction.

Turning now to the other exhibits, we notice that Mr. G. Lambert sends (No. 1) a good frame of three heads, taken direct with a single landscape lens. Mr. W. B. Smith's gold assaying (No. 2) is a creditable study, but the exhibitor should not have allowed the print to be stained. Mr. T. E. Freshwater's frame of *Bee Culture* (No. 3) contains a series of technically good photographs of direct interest to all those connected with bee-keeping. Mr. H. H. Cameron's portrait of Mr. G. F. Watts in his studio (No. 4) is perhaps rather hard in the lighting, while it is not difficult to trace in Mr. P. Ennis's pictures (No. 8) *Spring Time*, (No. 9) *The Path across the Common*, (No. 10) *A Reedy Mere*, and (No. 11) *The House by the Pond*, distinct traces of the influence of Mr. F. P. Cembrano's method. In No. 9, however, an attempt at impressionistic effect by means of fuzziness is not successful, but the other pictures are excellently composed and defined, and all are well printed on gelatino-chloride paper. *Carlisle Cathedral* (No. 12) on collodio-chloride paper, by Mr. J. B. Scott, is an accurately exposed interior, and Mr. C. Knight's *Hurdle Races and Steeplechases* (No. 13) are passable examples of a style of photography to which this exhibitor has for some time paid special attention. The Vienna photographer, Mr. J. S. Bergheim, sends seven figure studies and portraits (Nos. 18-24), which betray considerable artistic ambition. The study of a head (No. 17) errs on the side of softness, while the portrait of a lady (No. 21) proceeds to the other extreme. In their portrait of a lady (No. 25) Messrs. J. Chaffin & Son show a well-lighted, carefully posed study, and in *His Last Departure* (No. 28) Mr. R. Murray Lawes (whom we are glad to note among the exhibitors) a loftily placed but pathetic representation of the *Northumberland* flying the flag of Sir W. Hewitt, V.C. (who died a week after the ship's arrival at Spithead), and the *Sultan* (Captain Rice) leaving Vigo, March, 1888. Mr. F. Boissonnas gives in a *Sunset Study* (No. 30), a colour correct translation of the subject. This brings us next to a series of twelve small portraits of well-known artists and society people by Mr. F. Hollyer (one of the Judges) which are exceedingly happy in the poses selected. In (No. 47)

"Lions at the Zoological Gardens,"

by Mr. A. H. Benham, the highest praise we can give is that they vividly recall Mr. T. J. Dixon's *Lions*, shown so far back as 1879. The blue undertone of *A Devonshire Meadow* (No. 56), by Mr. J. G. Sinclair, is a characteristic drawback of many gelatino-chloride prints; and as for Mr. A. J. Golding's *Eventide* (No. 58), on the same description of surface, it errs on the side of a yellow colour. Mr. J. B. Scott will forgive us for pointing out that the charmingly posed lady in a *Reverie* (No. 59), is not in a reverie at all, but is looking straight out of the picture in the blandest possible manner. Mr. F. Thurston's outdoor portrait studies (Nos. 60–62) of the Earl and Countess of Albemarle and the Ladies Keppel are most praiseworthy in their unconventionality. In *A Calm Evening* (Nos. 86 and 87), Mr. G. W. Ramsay shows the difference produced by printing from the same negative on gelatino-chloride and on rough drawing paper, and an instructive object lesson in the relative amount of detail so obtained is the result. Mr. C. E. Corke's frame of six interiors (No. 90) are irreproachable, but Mr. E. H. Humphry's enlarged (bromide) view of the *Fort at Funchal* (No. 94) is flat and unpicturesque, while the lurid tone of Mr. J. E. Austin's landscape, *Pathways of Light* (No. 95), taken direct with a spectacle lens, somewhat transcends, we fear, a really natural effect. In

"A Rocket to the Rescue" (No. 96),

the picture of a rocket in its flight towards a doomed ship, with figures on the beach and a lowering sky, Mr. E. H. Godbold has accomplished a photographic *tour de force*, but little else. Mr. J. Carpenter's vase of *Cypripediums* (No. 98) is very correctly and cleverly translated. *Crossing the Brook* (No. 99), by Mr. H. Young, bears symptoms of halation. Mr. A. J. West's *Group of Children* (No. 101) is a pretty and reposeful study of young people; but in *A Haven of Rest* (No. 106), a platinum-toned silver print of fishing vessels in harbour, Mr. J. A. Hodges is scarcely so successful as heretofore. We have known this exhibitor treat similar subjects with far more poetic effect. A similar remark applies to the four exhibits of Mr. F. P. Cembrano, whose work is not by any means equal to that which he showed last year. Mr. W. D. Howard in (No. 115) *A Sunset on the Upper Rhine* and (No. 128) *The Boden Sea* is successful in reproducing clouds, sea, and sunset effects of a more subdued kind than those which largely prevail in the present Exhibition, and Mr. W. Illingworth's large direct portrait of *A Merry Belle* (No. 116) is capital in its natural and unforced charm. Good if not abnormally startling work is hereabouts shown by the Rev. E. S. Palmer (No. 118), *Skittles:* W. H. Banks (No. 121), *Skating:* A. W. Gottleib (No. 122), a thoughtful *Evening on the Severn* (on Alpha paper); and Mr. W. R. Cassel's two (Nos. 126 and 131) aspirations after *Land where the Olive Grows*. We like very much the small

Cat Pictures

of Mr. E. S. Dashwood, a frame of really humorous minute studies of the subterfuges of a knowing little cat to arrive at the contents of a milk-jug, in which the final picture shows him (or her) to be successful. These tiny pictures inevitably suggest Mr. C. Burton Barber. Mr. G. W. Ramsay's *On the Thames* (No. 133), *The After-Glow* (No. 134), *Springtime* (No. 135), and *Sunset* (No. 136), are good in intention, but their nebulosity proves that photography, by means of diffused treatment, cannot always be attempted with a certainty of arriving at the effects sought after.

In *Rubbish Burners* (No. 145), Mr. L. C. Bennett has well caught the effect of the smoke, but in the red-toned print (No. 183) of ships *In the Pool* the same exhibitor has represented the hulls of the ships too heavily, otherwise the picture is excellent. While little fault can be found with Mr. Harry Tolley's exhibits (No. 14) *Limestone Rocks in Derbyshire*, (No. 179) *Out of the Marsh a Fir-tree Grew*, (No. 377) *Christmas Time*, 1891, and (No. 379) *Calder Abbey*, they are not as imaginative as his work generally is. *Out of the Marsh a Fir-tree Grew* is, perhaps, the best of the series. Uranium toning is very popular this year, but it shows somewhat unequally in (No. 149) *Out into the West as the Sun went Down*, by Mr. A. V. Lloyd Jones, a picture which also strikes us as having an excess of foreground. Mr. Birt Acres' frame of *Hand-Camera Studies at Barnet Fair* (No. 152) are fair examples of this class of work; but the same gentleman's

"Study of a Cloud"

(No. 162), a series of five carbon prints, tracing the growth and changes of a bank of cumulus clouds, are distinctly clever as photo-

graphs, and interesting as scientific studies. Mr. A. W. Clayden should certainly see them. Mr. Acres also shows (No. 249) an enlarged study of *Scotch Cattle*, in carbon, and another frame of *Clouds* (No. 389).

Mr. W. J. Byrne is, as usual, a large exhibitor. A direct *Study* (No. 89), *J. G. Fleet, Esq.* (No. 151), *A Grecian Girl* (No. 174), *A Rehearsal* (No. 343), and *Little Bo-Peep* (No. 356), are quite equal in merit to the best of the large work he has previously shown, and his *Cabinet and Panel Studies of Children* (Nos. 278 and 314), show that he is successful as ever in juvenile portraiture. Mr. Byrne's little sitters always look as if they were quite at home under the ordeal of being photographed. In *A Trained Nurse* (No. 150), Mr. Henry Stevens depicts his well-known terrier nursing a sick cat, and in No. 173 the same two animals are comfortably asleep together. Mr. Henry Little's enlarged bromide interiors of (No. 155) *The Vatican Library*, (No. 344) *St. Peter's at Rome*, and (No. 357) *St. Mark's at Venice*, are capital in *technique*, although the latter would have done with a little more contrast. Messrs. Werner's skill in large portraiture is well exemplified in (No. 156) *Herr Snellen*, and (No. 232) *The Hon. Miss Wolseley*, but (No. 166) *Lady Henry Fitzgerald* is slightly hard. In addition to the one already noticed, Mr. J. B. Scott, of Carlisle, has several other frames of very good large portraits, of which we like the very soft and pleasing *Maiden with the Meek Brown Eyes* (No. 380).

Instantaneous Photography

is chiefly in the hands of Mr. Francis Blake. Years ago his pictures would have caused great comment; to-day, we fear, they will excite little interest. Nevertheless, they are undoubtedly clever. He shows (No. 158) *Pigeons in Flight, A Boy on a Bicycle, Engine of New York Express;* (No. 168) *Cow Pony* (in three positions) at sharp canter, and a series of tennis players (Nos. 424, 430, and 438) in various positions. Mr. R. Slingsby's examples of continuous magnesium light photography (Nos. 169, 291, 293) show the excellent adaptability of this illuminant to portraiture. Messrs. Mowll & Morrison (Liverpool), C. F. Treble (Clapham), Messrs. Window & Grove, Gabell & Co., E. Spencer, are all well represented in large portrait work, the task of separating them in point of merit being a difficult, if not impossible, one; while, in addition to the pictures for which they have taken medals, Mr. H. Yeo and Mr. F. Muller are also numerously represented by other frames of portrait studies printed in various styles. Mr. F. Muller's work is full of character.

We shall probably not be going wide of the mark in conjecturing that with (No. 170) *How's That?* Mr. R. H. Lord only just missed a medal. It is a large, sepia-coloured, platinum picture of two old gentlemen exchanging confidences over a pinch of snuff, freely handled and skilfully treated. In (No. 175) *An Idle Moment* and (No. 176) *The Ripened Grain* it is no drawback to Mrs. Tillyer to say that her work is decidedly suggestive of Mr. Gale's method; and the same remark applies to Mr. E. H. Hazell's *Old Stager* (No. 177). In (No. 186) *Gentle Janet*, the portrait of a small child by a window, Mr. P. B. Broomhall has not lighted the shadow side so well as he might have done. Miss Egerton's portraits of the Archbishop of York (No. 338) and (No. 364) the late Sir F. H. Doyle have a pleasing, engraving-like character, and are otherwise commendable. Her print of *Paderewski* (No. 188) is not a good one. Mr. A. R. Dresser's uranium-toned *Watching the Waves* (No. 189), *"Skylark" Landing* (No. 190), and *Storm at Hastings* are equal to his medalled work, but the toning process appears to be at fault. Mr. Adam Diston's small, carefully printed interior of

"The Rehearsal"

(No. 194) is quietly humorous. An old lady has fallen asleep, while the musician (possibly her son) is laboriously puffing at his instrument. Mr. G. Renwick has four frames of frost studies of undoubted excellence, but their position, so near to Mr. Stevens's and Mrs. Main's work of a similar nature, rather kills them. Mr. J. E. Austin's spectacle-lens picture of *A Son of the Soil* is too spruce a young agriculturalist to be picturesque, and Miss F. Browne's large portrait of *Mrs. Jack Johnson* (No. 211) suffers, we think, from not enough light being on the letters (the lady is supposed to be writing). Why is there more light on the face than on the writing-table? The lady in Mr. A. Burchett's refined picture (No. 206) of *The Love Letter*, who is smilingly holding that interesting document, has a ring on her third finger, which in our experience unmarried single ladies who receive love-letters do not wear. Perhaps, however, Mr. Burchett knows better. The picture is in this gentleman's best style.

In No. 217, Mr. E. Lambert has five other studies of heads taken with a single landscape lens. Mr. Kemp's *First Love* (No. 222) is a venerable and wrinkled old dame. Mr. D. Pym's large direct portrait of *Mr. Herbert Sims Reeves* is faultless, save in respect of being too sharply vignetted off. Mr. Seymour Conway's work in (No. 221) *Silver Birches, Borrowdale*, and (No. 230) *Evening Derwentwater*, is full of his former charm and delicacy of treatment, but we fear the new-fangled fads of the impressionist in photography overshadow this and many more examples of good pure photography. Mr. W. Wainwright's *Alpine Views* are also excellent; and another old supporter of the Society, Mr. T. M. Brownrigg, is to the fore with *Portinscale Bridge, Keswick* (No. 234), in which, however, while the water and the reflections are ably treated, the distance appears to us to be too flat and uniform. Mr. G. Lamley's *Sluggish River* (No. 239) is a well-chosen bit neatly photographed, and the same gentleman is also represented elsewhere by various other clever little landscape studies. By the way, has not one of these, *Blowing up for Rain* (No. 470), been "exhibited in London" before?

The cattle in Mr. J. Kidson Taylor's pleasing little *Evening* (No. 246) are well disposed, and Mr. W. A. Rouch's *Snap-shots* (No. 253) are clever of their kind. We certainly anticipated a far greater number of hand camera pictures than are here. The tones of the Rev. J. A. Rivington's three pictures are novel but not agreeable; nevertheless, (No. 258) the figure of a lady *Outside my Window*, is

A good Specimen of Outdoor Portraiture,

both in posing and lighting. Mr. E. D. Stern's *Eastern Scraps* (No. 255) are interesting from a topographical point of view, and, in Nos. 261–5, Mr. H. W. Bennett has a series of marine studies which show considerable skill in this class of work. In (No. 269) *Sunset over Bergen Harbour*, Mr. E. H. Fitch, from a negative by Mr. Paul Lange, has introduced a fine cloud effect, and the last-named gentleman's *Street Scene, Molde* (No. 447), though small, is perhaps as perfect an example of crisp definition as the Exhibition contains. Such definition should have been present in Mr. G. W. Tyser's *Venetian Views* (No. 270), for which the printing process selected is not quite suitable. Mr. T. M. Browrigg's *Studies on the Wey and at Derwentwater* (Nos. 274–5 & 282-4) are excessively soft. As an example of realistic photography Mr. A. W. Gottleib's *Study of Grapes* (No. 279) deserves notice, and Mr. H. Bedford Lemere's views in the mansion and grounds of Mr. A. de Rothschild are equally worthy of mention. In Nos. 289 and 290, Mr. E. H. Hazel shows that he has acquired great skill in animal photography, the dog and cat being very good. We should have been better pleased with Mr. W. Scorer's otherwise fine large views of *Netley* (No. 285) and *Portsmouth Town Hall* (No. 303) if they had formed the subjects of more vigorous prints. Mr. E. F. im Thurn, of British Guiana, sends a collection of ethnological studies of that region, and Mr. E. D. Stern's *Scenes in North Africa*, like the foregoing, if of little photographic account, make the same appeal to notice. Mr. W. Thomas sends three frames containing eighteen small quarter-plate pictures chiefly of seaside work, which contain much in little, and that of a really clever description. There was a time when small work was much despised; but these and other pictures in the present Exhibition show how most effective photographs may be made on a small scale as well as on a large one.

Herr Bergheim's *Miriam* (No. 324), a study of an Eastern beauty, is a fine, bold work which we much prefer to the somewhat too highly diffused portrait by the same photographer to which we have already adverted. Most of the successful portrait work in the present Exhibition is, on the whole, thoroughly well defined—a fact which in no sense detracts from its artistic value. There are some finely modelled cattle in Mr. H. Sandland's large carbon picture of *The Homestead*, but otherwise it is commonplace, if photographically irreproachable.

Some Interiors.

In Nos. 345 and 358, Mr. F. H. Evans shows several "interiors" of Ely Cathedral, excellently selected and exposed, and charmingly printed on sepia platinum paper, and Mr. Evans' work is, without

doubt, unexcelled in this particular department. Other examples of cathedral work are shown by Mr. J. H. Avery (Canterbury and St. Albans); Mr. J. H. Gear, C. Court Cole (Exeter); T. H. Morton; and Mr. Richard Keene (Dunfermline), all of which are, without exception, excellent. Lieutenant Cottingham's large picture of the *Yacht Diamond* (No. 369), suffers, like many other pictures in the present Exhibition, from the same thing having been, as it were, done to death some time ago; this, however, does not detract from its excellence. Of *Worn Out* (No. 370), by Mr. F. Whaley, the labour involved in its production almost precludes us from saying that it is disappointing in effect. A father has fallen asleep by the bedside of a presumably sick boy; but the lad appears to be in excellent health, and the father seems to be tired of reading the paper. There is nothing except a belated medicine bottle on the table to indicate that the boy is ill, and the whole picture utterly fails in effect. Mr. Whaley must try again.

Pictures on the Screens.

On the screens we note examples of J. B. Obernetter's landscape work (Nos. 440-5), which do the paper of that name every justice; and further small portrait work of Mr. F. Muller. *A Summer's Day* (No. 458) is a delightful study of cattle in water; while the clouds of *On the Upper St. John's*, by Mr. C. B. Moore, are highly effective. *Come here, you rascal* (No. 466), an old lady beckoning a nude child in a corner who has escaped her clutches is amusing enough to provoke more than a passing smile. Mr. Gear might cultivate this vein to advantage. In Nos. 475-6, Mr. Whitworth Wallis has some wave studies full of life and movement; and Mr. A. D. Halford some well-rendered cattle in *Dedham Bridge* (No. 490). The picture would, however, have been improved by a cloud. Mr. J. E. Dumont is represented by eight pictures, some of which are highly diverting studies of monks. One of them (No. 490), *To-morrow will be Friday*, is familiar to the public. Some of Mr. E. Detmold's cattle pictures are clever, one of them in an enlarged state hangs in another part of the room. Mr. A. G. Tagliaferro in *An Uninvited Guest* (No. 526), and *How happy could I be with either* (No. 538), has more than equalled all his former efforts, and is to be commiserated on having been so badly hung. In the former picture an impudent bird is boldly walking off with a portion of a dinner to the concern of the diner, while in the latter two attractive young girls are smiling and whispering aside, as a jolly old fellow surveys them out of the corners of his eyes with an expression of face such as is implied in the picture. In composition and treatment the pictures are indisputably the work of an able photographer.

In portfolios there are unframed pictures by Messrs. J. C. Douglas, J. B. Obernetter, J. H. Tasbell, John Catto, R. E. M. Bain, B. Kimball, the Prince of Travancore and others, many of which are excellent; and among the other exhibitors are Messrs. C. P. Castine, A. L. Spiller, E. C. Fincham, J. G. Sinclair, Rev. E. S. Palmer, J. C. Douglas, M. J. Harding (who shows richly toned work in Soltype), Harold Baker (capital portrait studies), F. Downer, W. Street, E. Spencer, S. Bourne (a most industrious and successful veteran worker), Rev. H. B. Hare, Edgar Scamell (with a series of *Street Cries*), H. L. Sworder, W. T. Goodbew, L. Selby, J. B. Hilditch, S. R. Brewerton (whose *Sheep Shearing* is very clever), Underwood French, G. A. Nelson, H. G. Moberley; and many others.

Photomechanical Pictures.

Carbon work, as we have elsewhere remarked, occupies a gratifying prominence in the present display among the general exhibitors, and both the Autotype Company and the Woodbury Company show largely in this and the photo-mechanical classes respectively. The former Company, in addition to the medal reproduction of *Young England*, show autotype enlargements, studies in red chalk, portrait studies on lined etching paper; an autotype reproduction of W. L. Wyllie's forcible drawing of the White Star liner, *The Majestic;* an autogravure reproduction of Lance's *Christ in the Carpenter's Shop:* and a sepia portrait study on opal. It need scarcely be said that these varied exhibits indicate the remarkable excellence of this Company's work as fully as ever.

The Woodbury Company are represented by numerous well-executed carbon enlargements, as well as by a frame of charming examples of Woodburygravure; Messrs. Thevoz & Co. (Nos. 385, 427, 433), J. R. Gotz by examples of phototypes of the delicate quality for which the firm is renowned; Messrs. Boussod, Valadon, & Co. (Nos. 388, 395, 400, 405, 410–13, 425, 428) have a varied collection of Goupilgravures, photogravures printed in colours, of well-known paintings, exhibiting the world-famous productions of this house to perfection. Mr. J. B. Obernetter's photogravures (Nos. 422, 423, 431) are charmingly soft and dreamy in quality. Mr. R. Frost's photographs of machinery (Nos. 393, 406–8) are specimens well illustrating the utilitarian adaptations of photography; and Mr. E. S. Shepherd's photogravures (Nos. 390, 391) bear comparison with the best of the fine work among which his is placed. Other exhibitors in the department of reproduction are Mr. J. H. Roller, Mr. C. E. Corke (with a good copy of a water-colour painting), Mr. A. Guye, jun., shows (No. 396) some admirable enamel work, and Messrs. Forrest (No. 403) a large portrait of Mr. J. Hauff, the negative and bromide enlargement being developed with amidol. Mr. C. Coles' windows (Nos. 414–17) on Solio paper are examples of well-exposed pictures.

In the department of scientific photography, Mr. C. W. Gamble is represented by a history of Dentition (No. 426), showing the development of temporary and permanent teeth; Mr. T. Charters White by (No. 429) photo-micrographs of anatomical subjects; and Sir H. E. Roscoe and Mr. J. Lunt by (No. 432) photo-micrographs of pure cultivation of bacteria from sewage.

The Apparatus.

The display of apparatus is not particularly large, although it contains several novelties, most of which, however, have recently been noticed in our columns. The apparatus was explained at the Technical Meeting of the Society in the Gallery on Tuesday night, and such descriptions of novelties as we have not already given appear in our report. The exhibits include specimens of Carlotype printing-out paper, cards being sensitised, and requiring neither mounting nor toning, the results much resembling kallitype; excellent film negatives, and negatives on photo-mechanical plates, shown by Mr. J. D. England, as well as the same firm's neat and effective film-carriers with aluminium ends. Messrs. W. Watson & Sons new studio camera stand and other examples of this firm's excellent photographic cabinet work, including the "Acme" camera, all the metal work of which is in aluminium, thus considerably reducing the weight; "Nameit" for producing titles on prints; Mr. W. Sanders' opera, marine, and field-glass camera, with metal roller slide; the Dresser hand camera (H. Crouch); an adjustable vignetting attachment for printing frames (J. H. Smith); a beautiful "wide-angle" camera by Morley & Cooper; Messrs. Smith & Sons' new plate washer; a self-adjusting tripod head (Mr. W. Goode); stands fitted with Elmers' patent levelling head (Newton & Co.); varied exhibits by Messrs. J. R. Gotz; Houghton & Son; Adams & Co.; Messrs. R. & J. Beck; the Ideal optical lantern (Archer & Sons); a case of lenses by Messrs. Swift & Sons; and the standard system of fittings for the attachment of lenses to cameras, for which Messrs. Taylor, Taylor, & Hobson have received a medal. This system was fully described in a recent number of the Journal: while, as already said, those novelties in apparatus not noticed in this brief survey of the exhibits will be found treated of in our report (see p. 636).

The Lantern Slides.

Only ten sets of lantern slides were sent in for competition, Mr. E. G. Lee, of Newcastle, taking a medal for a clever series taken by means of a hand camera. Mr. T. E. Freshwater shows slides of *Bee Culture;* Mr. G. Hankins a miscellaneous collection with a great variety of tone, while, in Mr. J. Dore's three sets of landscapes and animals, lifeboat practice, and clouds and sea, not only are the tones most admirably managed and varied, but the slides are beautifully bright and clear. Mr. Dresser's slides of the *Wild West Show* are brilliant and animated studies; Mr. Carpenter's flower subjects are as carefully rendered as his prints of similar subjects; Mr. A. J. West is entirely successful with his yachts and ships both artistically and technically. Messrs. J. D. England, H. Sandland (animals), and A. Brooks also show excellent exhibits in this section.

In taking leave, for the present, of the Exhibition, we must not omit to acknowledge our indebtedness to the courtesy of Mr. R. Child Bayley, the assistant secretary, who has been most assiduous in affording information to the representatives of the press.

PHOTOGRAPHIC LIMITS.

[London and Provincial Photographic Association.]

When so much is being said as to the true status of photography, what it can and cannot do, what it ought and ought not to do, I feel that a survey of the subject and the criticisms upon it might be made with profit. Save me from my friends, to say nothing of my enemies, might Photography well cry; for it is blamed, on the one hand, for its extreme accuracy, and, on the other, for not being accurate enough. The fact that such a question can be asked as, "Can photography lie?" and a serious answer be expected, shows the exceedingly great misapprehension existing as to photographic limits. Why not ask, "Can a painter's brush lie?" It does that same thing many a time and oft. While journeying this summer, I saw a painter busy on a certain view, and, though his drawing was reasonably good, his colouring almost blinded me. A well-taken photograph would have been vastly preferable. In this connexion I cannot but fear that, when those earnest workers who are trying to solve the photography-in-colours problem attain their end, they are going to be somewhat disappointed. Colour may be obtained, but not atmosphere; and to an artist that means a great deal. The most ardent camera devotee must own that the scope of his beloved instrument is limited; but he has a right to demand those limits shall not be arbitrarily circumscribed, or that photography shall be looked upon only as the poor relation of painting. Photography suffers because it is ordered to confine itself, outside of pure portraiture, to scientific work mainly, and is told it should not trench on the artistic preserves. The camerist is fully justified, and the claim cannot be too often or too strongly made, in drawing on all the resources of both science and art to realise his mental conceptions. As painters use different brushes for different kinds of work, so the camerist uses different lenses. What may be a positive defect in a lens when used for one branch of camera work proves often a virtue for another, and the artist is shown when the worker has skill and taste enough to reconcile the lens to the object sought. This means endless experiments, disappointments, exercising the most patient judgment, and, in short, attempting to adjust the too-often conflicting claims of art and science in the photographic field. Although this is a broad and somewhat well-worn subject, there are still some things which can be said, and plainly said, upon it. Mr. Hinton's recent article, referring to work at exhibitions, should be widely and thoughtfully read, and its temperate tone gives it added importance. Exhibitions for the art side, pure and simple, have been held; but it should be suggested to the wise and good who preside at such exhibitions, or fill the post of judges, that art is sometimes confounded with liberality, and they are by no means one and the same thing.

Science and Photography.

Scientists labour to secure as nearly perfect instruments as possible, and then, if they do not possess the art instinct, are apt to quarrel with those who believe not alone in elucidating some great scientific fact, but in turning the keen eye of the lens on the beautiful as well as the useful, studying its possibilities with a loving reverence until the senseless instrument seems to enshrine a living soul. I do not see any need for perpetually erecting this barrier, nor why those who keenly enjoy every new discovery in the pure science of photography should not also realise what great power it gives in developing the art side. The wonderful achievements of photographic science in the constantly expanding fields of human thought have, to some extent, bewildered people's eyes, and affected their judgment. In its vastly increased facilities for work, photography is in danger of growing very much to one side, and that the scientific, unless the art fanatics, as some critics consider them, bring on such a thunderstorm occasionally as shall clear the controversial air, and allow photography to show what is possible in the way of broad, healthy growth. Why is it that, if we are so willing to acknowledge the tremendous strides made in strictly scientific knowledge, thanks to the lens, we are reluctant to acknowledge its power in the art world? Partly because photographers themselves as a body are not yet able to realise that the work is more than a pastime or a means of wage-earning, that, if they expect people to respect photography, they must prove its indubitable right to respect and give it constant and faithful study. Hundreds of photographers are not fit for their business, and very few, I am afraid, follow the custom of a distinguished Frenchman, and, out of working hours, study daily the effect of varied lighting on two figures, one draped in white, and one in black. How many understand the importance of the quality and thickness of thin skylight glass as affecting the limits of photography? Artificial lights, such as electricity or flash light, are good in their way, but are worse than useless in unskilful hands, justifying the reproach that photography is attempting too much. There is great room for extending photographic limits in the studio if operators would be liberal-minded enough to open their eyes and cultivate their understandings. This means educating the public, as well as the profession, and might rule out a large proportion of the latter; but that would be no loss, and the profession, as a whole, would gain immensely in the respect of men. Of course a pint pot is not to be blamed for being such, but it should not attempt to hold the ocean.

A story told of Douglas Jerrold may illustrate this point. Once an utterly incompetent author attempted to justify some of his poor work to the witty critic by the plea, "A man must live, you know!" "I don't see any necessity for it," said Jerrold. Many advanced photographers are, it should be said, ready to welcome new ideas, but are held back by the consideration that great changes involve at first increased expense, and sitters fail to appreciate that fact. Perhaps in no one branch of human knowledge have as great and varied improvements been made the past few years as in photography; but in some ways, while its limits have been extended, the work has suffered thereby. People are apt to imagine not that real progress has been made, but that the trick has been more cleverly managed, so that in one sense the work was more honoured when it cost more time and labour than now, when a vast world of appliances have made it easier. We do appreciate a thing more when we have to work for it.

The Value of Previous Training in Drawing and Painting.

While in England, nothing has impressed me more than the care given, on the whole, to making an exposure, guarding the plates from unsafe light, and, in fact, taking pains to do all the work well. It has been my privilege to work with some of the best-known English photographers, and to learn many lessons thereby. I think in this connexion that previous training in drawing and painting should be valuable as giving freedom from the usual cut-and-dried recognised methods in camera work. Neither microscopic definition nor indiscriminate fuzziness, neither hand cameras nor tripods, is the only true and to be accepted doctrine for camerists, but each subject should be studied as a painter studies his subject, and treated as will show it to the best advantage. If this means obliterating any part of the negative or print, it should be done without the slightest apology. In short, from the moment of taking the plate from the box to mounting the finished print, consider, and only consider, the effect you wish to obtain. There is a certain class of critics who say photographers have no call to attempt purely illustrative work, it is beyond their province, and they wax eloquent on those unfortunates who essay the *rôle* of original designers and translators of poetic ideas into visible pictures. There are, to be sure, poems utterly unfitted for photographic reproduction; but there are many, very many, others which could well be illustrated by the lens, and the results utilised in some of the beautiful processes now possible, so that the reproductions would deceive the very elect as to their origin. The fact that it is in our power in these days to use lenses of such widely differing power is vastly more than adding to a painter's stock of brushes, and he who seeks to do really artistic work must have a battery of them, take the time to consider which one will be best for the view desired. Many workers use a lens altogether too large for the plate, which is almost as bad as straining a lens beyond its capacity. The difficulty of using different lenses in one front board seems likely to be met by the adjustable flanges now on the market. Like every other part of the apparatus, the lenses should be easily and quickly adjusted, and every one have a cap for one end as well as the other.

Landscape Work and Development.

Regarding landscape work, the matter of limits is simple, to define interiors far more so, and figures most difficult of all. But it seems to me, that if a figure study tells without explanation the story it is intended to tell, the designer can well afford to be utterly indifferent to all derogatory remarks as to whether his picture is or is not what certain grumblers would call "just a photograph." One of the leading art critics of New York was showing me some photographs a while ago which I said were poor, but which he intended to reproduce in a well-known magazine. "You look at them," he said, finally in a very positive tone, "merely as a photographer. I look at them as an artist." "Pardon me," was my reply, "I have been a photographer a very few years and up to that time worked in painters' studios."

When the camerist comes to the developing stage, the Scriptural injunction should be adopted of proving all things, and holding fast to that which is good. The danger, however, is that the more expert a worker becomes the farther he is tempted to stray from the path of true art, simplicity, studying not merely the most fitting medium for showing his work, but making it a means of exhibiting his purely technical proficiency. There should be far more attention paid to development, and no one but the operator should by rights develop the exposed plate. Then, too, comes up the question of what is hand-camera work. At a recent Society meeting it was agreed that, if a

bonâ fide hand camera was placed on a tripod, its results were not really hand work. Considerable discussion took place, but it would seem as if we miss the real value of the work itself by raising such nice distinctions.

Relations between Professionals and Amateurs.

And now there is one more point which suggests itself, and that is, the true relations between professionals and amateurs. There should be no jealousy between the two detachments of the camera army, as both seek a common end, and can best attain it by united action. I do not believe in drawing a sharp line of demarcation, remembering what I personally owe as an amateur to professional advice and criticism. It has been my fortune to be thrown into close relations with the profession at several conventions and exhibitions in America, and have, despite occasional illiberality, received from the best part of the members only cordial kindness and respect. We can help each other and frankly own that fact.

In closing, let me say that this question of photographic limits is, after all, largely a matter of each worker's taste and skill. From the most careful scientific analysis to the most artistic conceptions, the lens obeys the will of the brain, using it far more broadly than some are willing to believe. The subject is one which could be followed into many bypaths and is too great for one evening's discussion. Let me put in a plea for fair judgment, a welcome for everything which will aid photographic progress in any and every field of human endeavour, and a reminder that such progress will be best attained by ignoring the point whether this or that branch of the work will be most benefited by each new discovery, remembering that advancement in one means advancement in all. Working on broad lines, keeping brain, eyes, and ears receptive and liberal, we will in time place photography in her true position before the world. Let her limits continually expand, and each and all lend a hand in the good work.

Catharine Weed Barnes.

DECORATIONS AND FITTINGS.*

The decorations of the room itself should be delicate, chaste, and neutral in tint, relieved with gold or pale colours, which act as a foil to any pictures that may be exhibited. The idea is to have surroundings that, without being sad or assertive, should set off the contents of the room to the best advantage. A very light and pretty style is the Moorish scheme of ornamentation, with pale green for the predominating tint, and fretwork painted of the same colour, all bright, pronounced colours being avoided except in very minute quantities. Any small window, the light from which is not important, may be glazed with stained glass often with a very pretty effect.

The furniture, plain and good, with chairs and lounges, comfortable and luxurious, works of art of various kinds, interspersed with handsome foliage plants, may be placed here and there with good effect. A moderately dark carpet is to be preferred, as it affords rest to the eyes, with a few richly coloured rugs laid here and there, and at least one large mirror fixed where lady visitors can see themselves from head to foot without trouble. The dominant idea in fitting the reception-room is to induce in the sitters a pleasant and satisfied frame of mind, and to remove as much as possible any feeling of impatience or dissatisfaction in having to wait some time before their turn comes to place themselves in the hands of the operator. A person irritated and impatient is in the worst possible condition for having a pleasing portrait taken, so it follows that every means should be adopted to interest and amuse. Some copies of good periodicals and illustrated literature, with a daily newspaper or two, will help to wile away the time.

The illumination of the reception-room should be fairly strong; if too subdued, the strong light of the studio is apt to cause a contraction of the pupils of the eyes, and make them look smaller than they really are. To persons with very sensitive or weak eyesight the strong studio light will often, under any circumstances, induce a frown that is difficult, if not impossible, to get quite rid of during the short time they remain in it, to the disadvantage of the portrait. Of course, this is intensified by having just beforehand stayed in a room in which the light is very subdued. The small panes of glass with which many studios are glazed, and the forest of sash bars necessitated, militate much against good expression, unless the light is filtered through waxed paper or its equivalent. The opinion of the late O. G. Rejlander was that the light on the sitter should fall with the least possible obstruction, and not a bar more than absolutely necessary should be used. The studio in which his most successful pictures were taken was lighted by two windows, each glazed with one pane of plate glass. A better authority it would be difficult to find.

With regard to the colour of the glass room, consensus of opinion is in favour of pale blue or grey, with little or no ornamentation. Of course, something depends on the space to be covered, but in a studio of the ordinary kind nothing is better than this. Sometimes dark chocolate or brown is used, but has the disadvantage of making the shadows too heavy, unless a very complete system of reflectors is used to counterbalance it; it has, besides, no compensating advantages whatever. The idea of it being restful to the eyes has, I believe, been proved fallacious; and, in addition, the exposures are considerably lengthened, especially if the studio is lighted only from one side and part of top.

With regard to the floor, few things are better than good linoleum to cover it with in the first place, on which may be laid small carpets or rugs that may be easily pulled aside as occasion requires. Handsome skin rugs are very useful as accessories, besides improving the appearance of the place. Foliage plants and ferns are both decorative and useful, and should find a place in every glass room. Well-grown plants afford unending variety as accessories, and almost supersede the use of furniture in picture compositions; at any rate, by their aid very much furniture can be dispensed with, and very indifferent upholstery work made to look well.

Backgrounds are important fittings, and, with the exception of large ones heavily mounted at the end of the studio, should be light and portable as possible, for in these days of fancy lighting they have to be continually moved about from place to place according to the effect desired. Unwieldy heavy backgrounds I look upon as unmitigated nuisances if they have to be shifted about much; there is always danger of upsetting them or something else, besides occupying a good deal of time that might be better spent. I think any operator working single-handed will bear me out in this opinion. Blinds can scarcely be looked upon from a decorative point of view, although they considerably influence the appearance of the place. The most useful are thick, soft, dark blue and ordinary white blinds, which should be kept clean and in order. Ragged, weather-stained blinds always give a disreputable look to a gallery. An additional large, blue gauze curtain is exceedingly useful in moderating the effects of a strong light without perceptibly slowing the exposure. Footstools of different heights are always in request, and are better than extemporising boxes, books, or anything that may come handy.

The dressing-room devoted to ladies should have bright, cheerful fittings, and the usual toilet appendages, not omitting a large cheval glass, which is always appreciated. Fresh-cut flowers set about in suitable receptacles give a homely, pleasant effect, and are always an improvement to any scheme of decoration. It goes without saying that the whole establishment should be kept as free from dust and dirt as possible. Slovenliness as an eccentricity has had its day, and the better order a place is kept in the more attractive it is.

Edward Dunmore.

* Concluded from page 615.

EXTRACTS FROM THE DAILY PRESS ON THE PHOTOGRAPHIC EXHIBITION.

[*Daily Chronicle.*]

A photographic Exhibition has better reason for its being than most exhibitions can boast. The few people who have gained distinction by not becoming amateurs in the art will most likely visit it out of curiosity; the others will go as a matter of course, as critics. And both classes will have their reward at the annual Exhibition of the Photographic Society of Great Britain. The cognoscenti who are learned in tones and lights and distances will there find all that is best in these things, and even the most hardened photographic Philistine will have cause to wonder and admire. To the latter, whose education in matters photographic has been got from the pictures of professional beauties in shop windows, and "views of Margate," the most startling thing will be the decadence of the silver-print. He will be surrounded by pictures done in "bromide," "platinum toned, Obernetter paper, "Carbon," "Gelatino-chloride," "Soltype toned with platinum," "uranium-toned bromide," and in many more bewildering ways, but his old familiar friend of the family portrait album will meet his glance but seldom, and even then will be in a glorified, refined condition. The silver-print, indeed, seems as much doomed to extinction as the primeval Daguerreotype, and it is cause for no regret, for the platinum or bromide process—besides being permanent—is susceptible of far more artistic treatment, and is certainly more restful to the eye than the best work done in silver.

Of the Exhibition itself it may be said that it is of greater merit than that of any previous year. The pictures shown are all of a high standard of excellence, and the task of the judges in awarding medals must have been one of no little difficulty. The work which will command most

attention, no less for its beauty than its size, is a carbon enlargement, exhibited by Messrs. Elliott and Son, from a negative by Mr. Birt Acres. The picture, which measures 7ft. by 5ft., is a fine study of the surf breaking upon a rockbound coast. A greenish tint has been given to it, which heightens the realism, and there is none of that blur which so often obtrudes itself upon photographic seascapes. Of landscape work there is an infinite variety. Mr. B. Gay Wilkinson gets a medal for a series of six studies, all of which are gems in their way; but the best of them, and perhaps the very best thing in the exhibition, is *The Peaceful Evening Hour*—a triumph of photography, which shows better than anything else can show of what the art is capable. Mr. Karl Greger exhibits some really beautiful studies in the same department, his *In the Welsh Mountains*—in very low tones—being a delicious bit of work. A singular fatuity in the matter of framing is shown by not a few of the exhibitors. For example, Mr. W. Bedford, who is awarded a medal for some splendid work in carbon, has altogether spoiled the general effect of his pictures by putting them in frames of the same colour as the prints—without even the relief of a white mounting; and again and again one comes across good things crammed into frames that are utterly unsuitable. Mrs. Main seems to have quite solved the difficulty of presenting snow in a photograph as snow, and not as a blank white heap of something which might be flour, or cotton wool, or anything but snow. Her snow is crisp and cold and natural, and she certainly deserves the medal that has been awarded to her. A remarkable and most interesting photograph is that of M. F. Boissonnas, representing Mont Blanc at a distance of fifty-six miles. It was taken with Dallmeyer's tele-photographic lens, and was the result of seven minutes' exposure on an August evening during windy weather. The detail is wonderful. The pictures of the mountain taken by an ordinary lens which are exhibited by its side conclusively show the advantages of Dallmeyer's lens for distant work. In the way of portraits there is nothing better in the exhibition than the head of an old man by Mr. F. Muller. It is the nearest approach to a fine old steel engraving that photography has yet produced, and is admirable in texture and colour alike. To an instrument that can make a picture of a flash of lightning and take the portrait of a bullet in full flight everything is possible, and the examples of instantaneous photography which the exhibition contains are not its least attractive part. The most charming, because the most spontaneous and happy, is *Where there's a will there's a way*, by Mr. E. S. Dashwood. These are four small views which tell the tale of a cat straying from the path of rectitude and stealing milk from a jug. The first shows Pussy making a bee line for the jug, the last exhibits her standing stiffly on three legs, while she licks the paw which has just been dipped into the milk. *Blowing Bubbles*, for which Mr. H. Yeo gets a medal, also tells a tale in a way in which only instantaneous photography could tell it. All the latest things in apparatus are here to be seen, and for any one who meditates entering upon a career of photography they would form a singularly complete outfit.

[*Daily News.*]

The annual Exhibition of the Photographic Society of Great Britain, is of considerable and varied interest, especially with regard to the landscape work, in which field there is every year a closer affinity between the photographer and the painter of pictures. There are not many special discoveries to record this time, but the level of artistic attainment is well maintained, and it is evident that the judges of the 871 productions submitted have taken time and trouble in their selection. More than 600 contributions have found wall space, and, as usual, several medals have been awarded. The most successful exhibitors include amongst the landscapists Mr. Karl Greger, with a series of pastoral and other rural subjects, platinum-toned prints, in which atmosphere and distance have come out very successfully; Mr. W. Bedford, who has several picturesque views in Norfolk, richly brown in tint; Colonel J. Gale, who combines rustic and marine scenery with figure groups very tastefully; Mr. B. Gay Wilkinson, with some dreamy twilight effects, two or three of which suggest brush-work and individuality rather than the exigencies of the camera; Mr. A. R. Dresser, whose contributions include a fine view of the meeting of Conway and Lledr rivers; and in marine photography Messrs. Elliot & Son, with a carbon enlargement seven feet by five feet in size, from a whole-plate negative by Birt Acres, representing sea waves breaking on rocks, and printed, to assist the illusion, in a decided green tone. Specially by itself must be noted a remarkable view of Mont Blanc, taken at a distance of fifty-six miles, with Dallmeyer's tele-photographic lens, by the late Mr. F. Boissonnas. In comparing this with a smaller view of the same by an ordinary lens one realises the remarkable character of this curious experiment, and to the practical photographer, be he amateur or professional, it should be of much interest. In portraiture Mr. F. Muller gains recognition for a man's head, in which the modelling and the expression of character in the face are forcibly represented; while, amongst numerous children's portraits, a medal is taken by Mr. W. M. Warneuke for a nearly life-size half-length of a little girl. Other medallists are Mr. Harold Roller, for direct portraits taken in a room, notably an excellent one of Miss Alma-Tadema; Mr. J. E. Austin for a couple of figure studies, excellent as to the pose and expression of the old man, who is mending a clock in one instance and perusing the contents of a bill in the other, both taken direct with spectacle lens; Mr. H. Yeo, for several photographs in different positions of a child blowing bubbles; Mr. Henry Stevens, whose flower pictures are unrivalled as reproductions of floral form and beauty of detail; and Mrs. Main, one of the best students of the pictorial attractions of frost and the shadows on snow. In a different branch of skill, that of photographic reproduction of pictures, the Autotype Company take a medal for their trancript of Mr. Edwin Douglas's Academy picture of horse and foals, entitled *Young England*. There are many contributions to the collection that are not far behind those mentioned in merit and value from various standpoints, and many well-known exhibitors who have taken so many of the Society's medals at different times that they should scarcely covet any more are prominently and well represented. From the Cameron studio we have Mr. Watts at work on his equestrian statue, and other contributions; Mr. Fred. Hollyer sends a dozen of his portraits of artistic, literary, and other "celebrities," for instance, Mr. Burne-Jones, Mr. Walter Crane, Mr. Andrew Lang, Mr. J. M. Barrie, Mrs. Ewing, and the Rev. Stopford Brooke; Mr. Birt Acres tells *The Story of a Cloud* in a set of photographs showing the change of form of a bank of cumulus clouds; Mr. Francis Blake, in his *Cow Pony* at sharp canter renders some mysteries of equine motion; Mr. J. B. Scott has some graceful full-length portraits of ladies; and Mr. W. J. Byrne some charming presentments of childhood. We may note also the luminous views in the Lake Country by Mr. E. Benson, Mr. H. W. Bennett's sea and boat photographs, a pair of frost studies by Mr. G. Renwick, sundry well-selected views of land and sea on a small scale by Mr. W. Thomas, and on one of the screens in the scientific branch may be studied the history of dentition, of various anatomical subjects, the cultivation of bacteria, and other matters helpful in the knowledge of ourselves and our enemies.

[*Morning Advertiser.*]

The annual Exhibition of Photographs by the members of the Photographic Society of Great Britain opens to-day, the introductory *soirée* having been held on Saturday evening. There have not been any great strides in the art since the Exhibition of last year, but there is a general improvement to be noticed in the majority of the pictures now hung in the gallery of the Royal Society of Painters in Water Colours. One of the great changes is the more extended use of very rough surface papers, which in pictures of a fairly large size is very effective; but unfortunately the desire to use the new paper has led to some of the exhibitors using it for pictures far too small from the artistic point of view for its use advantageously. There are also more prints on gelatino-chloride papers, and uranium has been more frequently used for toning, and carbon printing is more in evidence. If possible, the show is more popular than ever among photographers, though it is to be regretted that several of the best workers have not sent anything this year, probably in consequence of a little unpleasant incident which occurred at the last Exhibition. Notwithstanding that fact, however, there were more frames sent to go before the hanging committee than ever before. No less than 871 frames were sent, of which 633 are hung and 238 rejected. With regard to the rejected frames it is only fair to the hanging committee to say that, if the pictures were worse than some of those which were accepted, they must have been very bad indeed. These pictures are, of course, very few, and the general average of the work shown is high—so much so that from the point of view of artistic merit it is impossible to pick out one picture as the work of the year. This is explained by the fact that, as the merit of a photograph almost entirely depends on the subject chosen, and not on the subsequent manipulations, the higher the average of artistic merit the less the chance of any photographer producing a picture strikingly more artistic than that of the other exhibitors. Dealing now with the pictures, the one which will first strike the eye of the visitor will be a large sea piece (No. 250), probably the largest that has yet been hung at a photographic exhibition. It measures seven feet by five, and is a carbon enlargement, in a green tone, by Messrs. Elliott and Son, from a photograph by Birt Acres. It is a wonderful piece of work, and the sea is beautifully transparent, but one feels that it is too large, it is difficult to comprehend it from one point of view. As an enlargement it takes a medal. Karl Greger secures a medal for six pretty little pictures (No. 5) of rural scenes, mostly containing sheep, the choicest being *Homeward*. B. Gay Wilkinson gets a medal for a series of six pictures (Nos. 50–3), all of which are charming, but the best is that of the *Palaces of Parliament*, with the sun setting behind the Victoria Tower. W. Bedford takes a medal for a carbon print, *Salhouse Dyke, Norfolk* (No. 67), in a warm brown tone, of a winding stream with trees on the further bank, and beside which the fisherman has left his rod hanging over the water. Colonel J. Gale is awarded a medal for *The Incoming Tide* (No. 79), another effective carbon print. A. R. Dresser takes a medal for a picture of *Aylesford* (No. 140), a uranium-toned print on rough paper, the effect being a warm brown, and the view is looking across the stream to the town. It is an effective enlargement from a hand-camera negative. H. Yeo deservedly gets a medal for a series of fine pictures (141-144) of a little girl blowing bubbles, and for three portrait studies in a red tone, very soft and pleasing. F. Muller secures a medal for a fine portrait (No. 146) in a brown tone on rough paper. J. E. Austin gains a medal by *Worn Out* (No. 184), a picture of an old man examining a clock of somewhat ancient manufacture; the picture is excellent, and is taken with an ordinary spectacle lens. Henry Stevens' flower study of *Meadow Sweet* (No. 201) is very fine, and fully deserves the medal awarded to it. Mrs. Main is awarded a medal for six pictures, entitled *Frost and Snow* (No. 212), which are certainly the finest snow pictures that have been

exhibited. Snow is very difficult to photograph successfully, a fact which can be verified by comparing these pictures with some others hung close by, which are also the work of clever photographers. J. Harold Roller sends four pictures (No. 229) taken in an ordinary room, for one of which a medal is awarded. The portraits are admirable, and afford a good example of what a determined worker can do without a studio. W. M. Warneuke takes a medal for a beautiful portrait of a little girl (No. 243) in a white sun-bonnet, which is one of the prettiest and most successful studies on the walls. F. Boissonnas takes a medal for a very clever piece of work. It consists of a view of Mont Blanc (No. 404), taken at a distance of fifty-six miles, with an ordinary lens, about 5 inches square, and a portion of the same view taken from the same spot with Dallmeyer's new tele-photographic lens—a picture about 24 inches square, in which every detail is perfectly distinct and clear. The Autotype Company take a medal for an autogravure (No. 418) of Edwin Douglas's picture *Young England*—two mares and foals in a field. In lantern slides E. G. Lee takes the medal for a series of twelve (No. 637) from negatives taken with a home-made camera. The slides are pictures, and speak well for the effectiveness of the home-made camera. Among the pictures not medalled there are two at least which will strike the observer as deserving of such recognition—one, *The Love Letter* (No. 206), by A. Burchett, a charming study of a girl standing in a day dream beside a spinning-wheel, with an open letter in her hand, and the other a portrait study in red chalk (No. 196), an autotype reproduction by the Autotype Company of a large head taken by Downey & Co. F. Boissonnas sends a fine picture, *A Sunset Study* (No. 30), being a view of a hayfield, with three women in the foreground. Another peculiar print is H. J. Godbold's *Rocket to the Rescue* (No. 96), a photograph of a stranded ship with a rocket just fired to carry a life-line to it. The rocket is shown very distinctly. E. S. Dashwood's *Where there's a will there's a way* (No. 132), four pictures giving the history of a cat getting cream out of a jug on its paw and then licking it, will be a favourite, as will also be Henry Stevens's cat and dog studies, *A Trained Nurse* (No. 150) and *Tired Out* (No. 173). Birt Acres' five blue pictures (No. 162), showing the formation of a cumulus cloud, will attract attention, as will also Francis Blake's four instantaneous photos of *Cow and Pony* (No. 168) at a sharp canter. Many visitors will think W. J. Byrne's fine *Grecian Girl* (No. 174) to be very much like Mary Anderson. E. Lambert shows a fine series of girls' heads (No. 217), taken with a single landscape lens, which are clear proof that as good portraits, if not better, can be taken with such a lens as with any compound ones. Window and Grove send three studies (No. 218) of Miss Ellen Terry as *Queen Katharine*, which are good, as is also Gabell & Co.'s *Head of a Boy* (No. 224). *Professor Herkomer* (No. 238), by the same firm, is excellent. *Scenes in North Africa* (No. 304), and a series of tropical pictures (Nos. 295–302), by E. F. im Thurm, C. M. G., are very interesting. *Worn Out* (No. 370), by F. Whaley, is rather a pathetic picture. It shows an invalid boy asleep in bed, with the father, who has been sitting up with him and reading the paper, having also fallen asleep, the paper having dropped from his hand. There is a lighted candle on the table, and the dawn can be perceived through the window.

The show of apparatus is very meagre, the most striking piece being a camera, by Watson & Son, to take pictures 2 feet square, attached to a very ingenious stand, all the movements in which are regulated by one handle close to the operator. An aluminium tripod by Newton & Co. is very light, but rather conspicuous for use. The "Frena" hand camera by R. & J. Beck is extremely ingenious and compact, and will carry forty cut films. It is also very compact. Messrs. Crouch show the "Dresser" hand camera, another very useful form of instrument. The only medal in this section is taken by Messrs. Taylor, Taylor, & Hobson for a new system of fitting lenses, by which the flange of one lens fits into that of the size larger, so that a large number of lenses can be conveniently used in the same camera, and the screws are so constructed that there is no difficulty whatever in fitting the thread and screwing them into each other.

[*Standard.*]

Those who practise photography are usually artists. It is natural, therefore, that the interest in the annual Exhibition of the Photographic Society of Great Britain should be artistic rather than scientific. From this pictorial point of view, the work is of a higher standard than that of any previous year. The number of pictures submitted to the hanging committee has been greater, and more care has been taken in selection. Nor has the scientific interest been altogether neglected. The advances made in this direction during the last twelve months have not been remarkable, except in a single instance, of which an example is given in No. 404. This is a photograph of Mont Blanc, taken at a distance of fifty-six miles. Dallmeyer's tele-photographic lens was used, smallest stop, extension of camera 60 inches, with seven minutes' exposure at 6.15 p.m., August 27, in windy weather. The success of Mr. F. Boissonnas' experiment with the telescopic camera is unquestionable, and opens up many interesting possibilities. A perfect view of Mont Blanc even at this great distance has been secured, and opportunity of instructive comparison is offered with smaller photographs taken with an ordinary lens at similar and closer ranges. Another exhibit (No. 96) has some scientific, though little or no artistic, attraction. Even the uninitiated have ceased to be astonished at the lightning records of the camera. Daguerre found seven or eight hours' exposure necessary to procure a copy of a landscape that may be obtained now in an infinitesimal fraction of a second. Notwithstanding this familiarity with speed, it is worth noting the success with which Mr. H. J. Godbold has caught a rocket in its flight from the shore to a ship in distress. The colour is bad, but this is an unavoidable effect of short exposure and of the conditions under which it was presumably made. One or two mechanical improvements may be observed in passing. A new system of lens flanges and adapters has been introduced during the year. The screws are made to engage at one turn, and without the possibility of crossing threads, while the diaphragm indexes fall into a uniform and convenient position. It is hoped that the popularity of this system will facilitate the efforts of the Society to introduce a standard uniformity of lens flanges and adapters, an arrangement that will commend itself to amateur photographers.

Turning again to the pictures, it will be seen that by far the greater number are platinum and albumen silver prints. There is abundant evidence also of the prevailing disposition to cultivate low tones, and to take advantage of the effect of rough paper. How charmingly delicate and varied these effects may be is seen especially in the landscapes. This is a department in which the Exhibition is strong. Many of the prints will compare favourably with the finest engravings or etchings for refinement of line and softness of tone. For example, it would be difficult to discover anything more perfect than Mr. Gay Wilkinson's *The Peaceful Evening Hour* (No. 51). It is a small landscape, into which a pleasant atmospheric effect has been imported with remarkable skill. Colonel Gale, a well-known amateur, has also been very successful with a series of views (Nos. 79–75), of which the lines are sharply defined without being hard. Equal commendation is given to Mr. Bedford for his scenes on the Norfolk Broads. In common with many other exhibitors, Mr. Bedford has adopted carbon printing, the artistic possibilities of which on a large scale may be seen in a 7 ft. × 5 ft. enlargement of a sea view by Messrs. Elliott & Son (No. 250). The print is from a whole-plate negative, and, although in four pieces, is put together so skilfully that only the closest inspection can detect the joints. It is a remarkable work, even less on account of its size than of its artistic merits as a representation of the broken waters and lights of the sea. Amateurs, and even professional photographers, who have taken snow views, will appreciate the success with which Mrs. Main has overcome the difficulties in her series of prints (No. 212). In portraiture there are many interesting studies. Several of the most artistic are, however, hybrid, having been touched with the brush or crayon. Of the purely photographic examples, the most successful is Mr. F. Muller's (No. 146), the head of an old man. The line and colour are excellent, and remind one of the work of Velasquez. Mr. J. E. Austin's two pictures, *Worn Out* (No. 184) and *To Account Rendered* (No. 185), are a little "plumy" in colour, though they are very pleasant studies, and notable as having been taken direct with a spectacle lens. Upon the walls may be seen not a few examples of the use to which the camera may be put in multiplying pictures. The reproduction (No. 418) of a picture exhibited at the Royal Academy, by Mr. Edwin Douglas, has secured for the Autotype Company a medal. It is a close imitation of an etching, in which not only the brush work, but the atmospheric effects of the original are reproduced with astonishing fidelity. The screens and portfolios contain many prints that deserve attention. There are instantaneous photographs that may interest tennis-players and physiologists, photo-micrographs that will charm anatomists and students of bacteria, lantern slides of educational and artistic value, and celluloid film negatives that prove what great advances have been made with this substitute for glass. Altogether the Exhibition is of high technical and artistic interest, and its popularity may in some measure be predicted from the crowds of visitors who accepted Captain Abney's invitation to the *soirée* on Saturday evening.

[*Pall Mall Gazette.*]

The annual exhibition of the Photographic Society of Great Britain, opens to-day in Pall Mall. There was a *soirée* on Saturday, when visitors who were mere laymen were astounded by the inspection of a photograph of Mont Blanc taken at a distance of fifty-six miles. Dallmeyer's tele-photographic lens was used, smallest stop, extension of camera sixty inches, with seven minutes exposure, at 6.15 p.m., August 27, in windy weather. The success of Mr. F. Boissonnas's experiment with the telescopic camera is unquestionable, and opens up many interesting possibilities. A perfect view of Mont Blanc even at this great distance has been secured, and opportunity of instructive comparison is offered with smaller photographs taken with an ordinary lens at similar and closer ranges. Another exhibit has some scientific, though little or no artistic attraction. Even the uninitiated have ceased to be astonished at the lightning records of the camera. Daguerre found seven or eight hours' exposure necessary to procure a copy of a landscape that may be obtained now in an infinitesimal fraction of a second. Notwithstanding this familiarity with speed, it is worth noting that Mr. H. J. Godbold has very successfully caught a rocket in its flight from the shore to a ship in distress. The colour is not all that it should be, but this is an unavoidable effect of short exposure, and of the conditions under which the picture was doubtless made. As a whole, the excellence of the Exhibition is very striking, and Captain Abney may be congratulated upon the result of his efforts in getting it together.

[*Daily Telegraph.*]

TELE-PHOTOGRAPHY will apparently create a new field of activity for the lovers of the camera. At the annual Exhibition of the Photographic Society of Great Britain, which is open in the Gallery of the Royal Society of Painters in Water Colours, Pall Mall East, Mr. F. Boissonnas has a truthful picture of Mont Blanc, the negative of which was obtained by T. R. Dallmeyer's new lens, with an exposure of seven minutes, on August 27 last, in windy weather, at a distance of ninety kilometers (fifty-six miles). The photograph was taken direct, and is untouched. Messrs. Elliott & Son have been awarded a medal for their realistic enlargement, seven feet by five feet, of a sea piece—a breadth of broken waters. The print is in four parts, neatly jointed together. Artistic photography is making rapid strides, the use of rough paper being as helpful to the printing as it is in water colour. Sepia tints and broad wash effects are popular; but there are examples also of the school which delights in detail and definition. Amongst the most taking subjects are those shown by Mr. Gay Wilkinson and Colonel Gale. In portrait studies, Mr. F. Müller and Mr. J. E. Austin excel.

[*Times.*]

THE leading points of interest in the Exhibition lose, no doubt, considerably from the abstentions to which we have already alluded—abstentions which, among other things, leave almost unrepresented a class of work which has of late years come to the front—we mean that in which the higher forms of art are applied to photography. Under such circumstances it is difficult to award unqualified praise. Still, there can be no grounds of complaint that one of the Society's medals has been awarded to Mr. Karl Greger for his very charming little set of pictures (No. 5). Mr. H. H. Cameron's studio, which continues the traditions of his late mother, Mrs. Julia Cameron—a name which will long continue to hold a foremost place in figure work—contributes an excellent portrait of Mr. G. F. Watts (No. 4). The best work in the Exhibition is, undoubtedly, that of J. S. Bergheim, of Vienna. His two heads (Nos. 18 and 23) are of excellence which deserves more recognition than they have obtained at the hands of the judges. Most noteworthy, too, is Burchett's *The Love Letter*. Close by hangs a small piece (No. 9) by J. P. Ennis. There is poetry in the solitary bent figure wending his way in the evening sunlight across the common—poetry which we miss so frequently in photographic work. Colonel Gale's little *saynètes* are characteristic of a well-known photographer, perfect in execution, faultless of their kind. Mr. Gay Wilkinson's set illustrates the power which photography gives us of reproducing the beautiful effects of cloudland. The pictures are very good. F. P. Cembrano contributes a few pieces, *hors concours*. He inclines to the misty effects of Thames scenery, and his work is always remarkable. Mr. Dresser has been for years a prominent exhibitor, but he fails this year in attaining his usual standard. If not exactly pictures, Mr. H. Stevens's groups of dogs and cats (No. 173) are remarkable instances of the power which photography gives us of producing minute detail. It is impossible to pass by the head of an old man by F. Muller, of Munich (No. 146). What a model! And it is well treated; it will grow upon those who examine it. J. E. Austin's figure pieces (Nos. 184 and 185) are taken with a spectacle lens. To the uninitiated it may be necessary to explain that this means such a glass as we are accustomed to use for an eye-glass. The results, technically, are surprising. The subjects, however, are trivial, though no doubt of a character which will be popular. Remark the portrait of Professor Herkomer, by Gabell & Co. It has many points of excellence. The professional studio work is of the usual character. The stereotyped mechanical retouching, done, as a rule, without any knowledge of the sitter, cannot be too often denounced. Yet the public accept it—indeed, insist upon it.

Our survey of the pictures is necessarily brief. The Exhibition is not up to the standard which it might, under other circumstances, have attained. At the same time there is less absolutely bad work than usual. The committee have shown a laudable desire to profit by many reasonable complaints which have lately been made, and, contrary to the usual practice of the Society, they have rejected a large number of contributions sent in. But there remains much more to be done, and it is in the interests of the Society itself that we have mentioned questions which it will have to face.

Our Editorial Table.

A VOLUME BY THE HOLBEIN SOCIETY.

Manchester: A. BROTHERS, 14, St. Ann's-square.

THIS interesting work is a reproduction in *facsimile* of the edition of Dr. Martin Luther's *Catechism for the People, Pastor, and Preacher*, which was printed in Frankfort-on-Main in 1553. We have more than once had occasion to speak of the masterly way in which Mr. Brothers, by his process of photo-lithography, has reproduced in *facsimile* the *Dance of Death* and other works issued by the Holbein Society. It is enough here to say that, as regards distinctness and perfection of typographic outline, it is scarcely possible to conceive of the Frankfort edition being in any particular better than this, or even so good, when we take into consideration the fading of the ink which must necessarily have taken place in the original during the 340 years that have elapsed since it was printed. The work contains numerous drawings in addition to the text, which, it is scarcely necessary to say, is in German. The Society is to be congratulated upon the enterprise displayed in reproducing such scarce works.

"DRY PLATES."

Edited by CADETT & NEILL, Ashtead.

To those who employ the excellent plates of this firm, the information given in this, the first number of a monthly pamphlet they are issuing, should prove serviceable. Mr. Cadett himself contributes a most instructive article on "Ammonia in Development," in which he discusses the best way of keeping and using that alkali.

THE HAND CAMERA, AND HOW TO USE IT.

By WALTER D. WELFORD. London: Iliffe & Son, 3, St. Bride-street.

FIRST of all, discussing the hand camera in its different forms, together with the uses of its parts in their numerous variations, Mr. Welford proceeds, in the same exhaustive fashion, to deal with its manipulations, in the course of which he supplies a complete *vade-mecum* to its employment. Mr. Welford has devoted a great deal of time to practical hand camera work, of which he is a successful exponent, and this volume is, doubtless, the result of his own experiences. We can confidently recommend a perusal of it to all those who are contemplating hand camera work, who are thinking of taking it up, or who, having failed, are desirous of knowing the causes of their failures with a view to remedying them. Price 1*s*.

THE PHOTOGRAPHIC LENS.

By T. R. DALLMEYER, F.R.A.S., M.R.I., &c.

AN elegant illustrated pamphlet of thirty pages, giving such a full description of the tele-photographic lens of Mr. Dallmeyer as suffices to answer every question that can be put relative to either the construction, use, or mode of working the lens. It contains a synopsis of what has appeared in the various journals in regard to it, and is embellished with six plates and several cuts.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
October 3	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 3	Halifax Camera Club	
,, 3	Peterborough	Museum, Minster Precincts.
,, 3	South London	Hanover Hall, Hanover-park, S.E.
,, 3	Stereoscopic Club	Brooklands Hotel, Brooklands.
,, 4	Exeter	College Hall, South-street, Exeter.
,, 4	Glossop Dale	Rooms, Howard-chambers, Glossop.
,, 4	Herefordshire (Annual)	Mansion House, Hereford.
,, 4	Keighley and District	Mechanics' Institute, North-street.
,, 4	Lewes	Fitzroy Library, High-st., Lewes.
,, 4	North London	Wellington Hall, Islington, N.
,, 4	Oxford Photo. Society (Annual)	Society's Rooms, 136, High-street.
,, 4	Rotherham (Annual)	
,, 4	Sheffield Photo. Society (An.)	Masonic Hall, Surrey-street.
,, 4	York	Victoria Hall, York.
,, 5	Edinburgh Photo. Society	Professional Hall, 20, George-street.
,, 5	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 5	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 5	Southsea	
,, 5	Wallasey	Egremont Institute, Egremont.
,, 5	West Surrey	St. Mark's Schools, Battersea-rise.
,, 6	Bolton Photo. Society (Annual)	Baths, Bridgman-street.
,, 6	Brixton and Clapham	Gresham Hall, Brixton.
,, 6	Camera Club	Charing-cross-road, W.C.
,, 6	Dundee and East of Scotland	Lamb's Hotel, Dundee.
,, 6	Leeds Photo. Society	Mechanics' Institute, Leeds.
,, 6	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 6	Oldham	The Lyceum, Union-st., Oldham.
,, 6	Tunbridge Wells	Mechanics' Inst., Tunbridge Wells.
,, 7	Bristol and West of England	Rooms, 28, Berkeley-sq, Bristol.
,, 7	Cardiff	
,, 7	Croydon Microscopical	Public Hall, George-street, Croydon
,, 7	Holborn	
,, 7	Leamington	Trinity Church Room, Morton-st.
,, 7	Maidstone	"The Palace," Maidstone.
,, 7	Richmond	Greyhound Hotel.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

SEPTEMBER 27,—Technical Meeting,—Mr. W. England in the chair.

The meeting was held in the gallery of the Exhibition, and the apparatus on view was explained.

Among the few novelties shown and explained was Mr. W. Sanders' opera, field, or marine glass, which can be converted into a photographic camera and lens without altering its outward appearance. It then contains a telescope, twin photographic lenses, time and instantaneous shutter, metal roll holder

with twenty-four exposures), ground glass screen, and magnifier for focussing, all enclosed, the only projection being the shutter trigger, which does not protrude a quarter of an inch The instrument is focussed in the manner of all binocular glasses, and, when the picture is seen to the best advantage, it is secured while still visible through the glass. The time of exposure is regulated at will while viewing the picture, the shutter being always ready for either the shortest or longest exposure required. It is extremely portable, and may be directed towards a scene or object without arousing the slightest suspicion as to the object the possessor has in view. The largest-size picture capable of being taken by the instrument is 2×2; but, owing to the system of focussing, which may be changed from telescopic to photographic without removing the glasses from the eyes, they can be produced with microscopic sharpness, which will bear enlarging.

Messrs. Smith then explained their patent plate washer, the advantages of which are thorough circulation of the water in the tank, films face downwards, and the complete emptying of the tank once in every five minutes, causing complete elimination of the soluble salts in very little time. The sloping bottom and the washing-down action of the water inlet prevents the usual incrustation of hypo on the bottom, all deposit being ejected each time the large syphon acts, so that the plates are washed in successive quantities of pure water instead of in the usual more or less diluted hypo, and great saving effected in the quantity of water required.

Among Messrs. G. Houghton & Son's exhibits, Mr. W. G. Tottem showed the following novelties:—A revolving disc for vignetting, which, when wound up, carries a number of frames, thus preventing any hard lines. It would carry frames to a weight of 100 lbs. Mr. Tottem also showed an ordinary pen-knife with a diamond for cutting glass, and an interchangeable album in which the sheets are detachable by drawing out a small catch.

Mr. J. A. Sinclair showed Messrs. Adams & Co.'s lightning camera stand, weighing about 2 lbs., which is very rapidly opened and folded up, the legs bending instead of sliding; also the same firm's Vesta pocket camera and the new Adams' changing-back for ordinary cameras, carrying twelve plates in a small space, and being of the same register as an ordinary dark slide.

In explaining Messrs. Watson's exhibit, the firm's representative drew attention to many improvements in the Acme camera, one being the hinging under each other of joints of the shutters of the dark slides; and the decrease of weight on account of the use of aluminum, which, he stated, had been found easy to work (a 10×8 weighing 4¾ lbs.).

The other exhibits were explained by Mr. Howard, who said that the principal feature of the Dresser hand camera (H. Crouch) was that it had a rising front, and could be used as an ordinary camera with a screen in the usual way.

Mr. Gotz's, Messrs. Morley & Cooper's, Messrs. Newton's, Beck's (including a wooden model of the system of releasing the films and cards employed in the Frena camera), Archer & Son's lantern (with improved ventilating arrangement by which moisture in the condenser is obviated), and other exhibits, were also referred to.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

September 22,—Mr. J. Traill Taylor in the chair. There was a large attendance, and several ladies were present.

Mr. E. H. Fitch was elected a member of the Association.

The following question from the box was read: "In gelatino-bromide emulsion, what are the advantages, or disadvantages, of using a large or small proportion of gelatine in relation to the amount of bromide of silver?"

Mr. W. E. Debenham said a large proportion made it easier to obtain a fine emulsion; but it made the development and fixation much slower and the film more apt to stain.

Mr. W. P. Dando showed the programme provided by Sir Augustus Harris when the German Emperor visited the Italian Opera last year, on which occasion (said Mr. Dando) certain of the French artists at the last moment refused to sing, so that the programme had to be suddenly altered, and a portion of it taken out and replaced by other matter. Mr. Dando wished to know what the approximate cost of the alteration should be. He believed the programme (apparently a collotype picture on silk) was done abroad at an original cost of 300*l.*, which, with the alterations, had been brought up to 500*l.*, an amount Sir Augustus Harris refused to pay.

Mr. T. Bolas said such work would be produced from two negatives in the ordinary course of things.

No other answer was given to Mr. Dando's question.

Samples of amidol were distributed among the members.

The Limits of Photography.

Miss Catharine Weed Barnes read a paper on the *Limits of Photography* (see page 632), at the conclusion of which,

Mr. P. Everitt said that twelve or eighteen months before he was presumptuous enough to draw the attention of members of the Society to Dr. Emerson's work, and since those discussions they had had time to think over how the problem stood, he himself had been struck by the similarity between the development of painting and photography as compared with each other. In painting there had been a gradual departure from minute detail. The presentation of what was seen or what was imagined in all its detail was the rule in the past; but a characteristic feature of modern work was an element of mystery and a lack of definition which considerably excited the imagination. There was a similar progress in photography. He thought that in the past they had given too much attention to detail, and they looked now to broad effect and some want of definition so as to aid a story and excite the imagination. Having referred to the advantages which the painter had in being able to suppress or render detail at will in such a way as best to tell the story he wished to, Mr. Everitt pointed out that the photographer had little or no control in these respects over particular parts of his pictures, the power only being little and not comprehensive as in the case of the painter. Therein, he thought, lay one of the limits of photography. As regards reproductions of pictures in monochrome, as well as the copying of any subject or object for scientific purposes, he thought photography excelled any other of the graphic arts. For example, in the power of rendering lace no artist could equal a photographer. He hoped that in twenty or thirty years' time photography would stand on a much higher footing than at present.

The Chairman said, with regard to improvements in lenses (as suggested by Mr. Everitt) designed to enable one to select portions of a subject, that he feared that it was almost impossible. The photographer must have his subject before him, while an artist was able to carry it away in scraps.

Mr. Everitt said his reference was as to what portions of a subject should be sharp; and there a difficulty presented itself, that of how to accentuate a subject on widely different planes.

Miss Barnes referred to one of her negatives wherein the sky was defective, and in making a bromide print of which she developed up from the bottom of the picture, and so made the hills look about twenty miles away, whereas in a silver print they had only looked about five.

Mr. Debenham said it was a fallacy to suppose atmosphere was to be got sometimes by the bad definition of a lens, as though ordinary photography did not render it. Photography did thoroughly represent it, as in the case of McLeish's picture of *A Misty Morning on the Wear*. As regards the differentiation of planes, photography was capable of rendering it, and did render it, sufficiently, but if a photograph was much under-exposed, or made too intense, or printed too dark, they might lose the effect. Atmosphere is and could be rendered by photography independent of any blurring or out-of-focus effects with defective lenses.

The Chairman said that one of the finest examples of true atmospheric effect he had seen was an enlargement of a small picture of Durham Cathedral by Mr. R. L. Kidd (Messrs. Morgan & Kidd). The trees in the immediate foreground were sharp and bright, and the cathedral itself, across the river, was also sharp, but misty. Such an effect could never be obtained by simply putting the distance out of focus.

Mr. Debenham (continuing) said that artists said fine definition destroyed atmospheric effect.

Mr. Everitt said what was said was that one could not get atmospheric effect with sharp definition, but that with sharp definition one got sharp atmosphere. A certain amount of haze was always present in the air, by which the idea of distance was obtained.

Mr. Debenham said if atmosphere was present it would prevent definition, and they had to be content with the best focus the lens would give. In reference to another part of Miss Barnes's paper, Mr. Debenham deprecated jealousy between amateurs and professionals, and thought that the bringing of pressure on to dealers, &c., in order to get favourable terms was unworthy of professional photography.

Mr. H. E. Davis did not see where was the difficulty mentioned by Mr. Everitt as regards obtaining aerial perspective, and thought that with a sharp negative subsequent manipulations in printing would produce the desired effects. Of course, it required great care, but the effects of aerial perspective had been produced that way, and would, he thought, be continued to be produced in a similar manner.

Mr. Bolas said that with reference to Mr. Everitt's idea of being able to control local definition with a lens, the only contrivance that would produce the effect would be an ideally perfect lens in front of the camera. He could not assume the possibility of such a contrivance, but he thought that some kind of screen in front of the plate might be used for the purpose.

Mr. J. S. Teape said, in connexion with the art education of a photographer, he could say from experience there was nothing of greater value to him—even if he had only studied in the most elementary stages he would find it a most valuable power, particularly in respect to composition. It could always be seen whether a photographer had studied art or not, as he was certain to show it in the selection of his pictures.

The Chairman mentioned the unsuitability of the horizon line in many photographs, mistakes which a little artistic knowledge of the most elementary kind would save.

Mr. A. Clarke said he must plead guilty to having ordered backgrounds with the horizon line much below where it should be. He thought it gave dignity and majesty to a figure. The method was adopted by Reynolds and other artists. In regard to a suggestion of the Chairman as to sunning down white parts of a picture by judicious exposure to light, he thought such a method gave flatness. He would prefer to rub down a negative with spirit.

Mr. W. H. Harrison said that, at a recent meeting of the British Association, Colonel Tanner had stated that he had tried to find out if photography could replace the theodolite in surveying work, and there were differences of opinion on the subject. Some said they could measure distance to within five or six seconds of arc. The French had come to the conclusion that a pinhole lens was the best for the purpose, but the distances did not come out in the right proportion. It was a pity Colonel Tanner's paper was brought before the wrong section of the Association.

After further discussion, a cordial vote of thanks was passed to Miss Barnes for her paper.

A Novel Method of Packing Plates.

Mr. A. Cowan showed practically a new method of packing plates, which had been in use for twelve months, which did away with the use of paper, nothing being placed between the plates themselves. It consisted of cutting through the glass of the plates, and leaving the film uncut, the plates being thus packed face to face in pairs of equal size, and easily detached when required for use. There was sufficient hinge in the gelatine to stop any pressure or abrasion. It had been found an advantage to have the plates thus packed.

In reply to a question, Mr. Cowan showed that there was no fear of tear in the films.

The meeting then terminated.

North London Photographic Society.—September 20, Mr. A. Mackie in the chair.—After the usual preliminary business, the Secretary reported that, having tried the new developer "amidol," he had found it to work very satisfactorily. In some cases, according to exposure, he had found it difficult to obtain printing density, but, from the character of the image and the clearness of the shadows, after intensification gave no trouble, and worked well. As a

one-solution developer it appeared to fill the claims made for it. The Secretary further reported that he had received tickets for the annual exhibition of the Photographic Society of Great Britain, which, under the affiliation rules, were to be obtained by members at half price. Mr. Redmond Barrett then gave a practical demonstration of *Retouching*, showing, with regard to negatives brought by himself and by members, what should not be attempted, what ought to be done, and how to do it. Scratches, pinholes, and other defects were also dealt with, and the best mode of dealing with such explained and illustrated. With regard to the use of retouching medium, Mr. Barrett advised the use, not of the finger tip, but of a tuft of cotton wool, with which a very small quantity of medium should be well worked, not merely on but into the film. Should any of the work come away in the subsequent varnishing it would have to be made good when the varnish was dry; in fact, it was generally desirable to make any finishing touches at this stage. The subject was found exceedingly interesting, and a cordial vote of thanks to Mr. Barrett concluded the proceedings. Next meeting October 4, Optical Lantern Night.

North Middlesex Photographic Society.—Mr. J. C. S. Mummery in the chair.—One new member was elected, and about forty members were present. The Chairman introduced Mr. E. J. Wall, who discoursed on the *Life of a Dry Plate*. He started with the making of gelatine and the properties of bromine, the making of an emulsion, the necessity of bromide being in excess, the advantage of an iodide, and the method of increasing rapidity by adding ammonia and by cooking. The qualities of a good plate were discussed, and the advantages of colour-sensitive plates. He then gave a recapitulation of the theories which had been advanced to account for the action of light upon a plate, and followed on with a consideration of the qualities of the numerous developers in use. He strongly advised beginners to leave hydroquinone alone, and to trust to pyro and ammonia. In looking over prints sent in to the *Amateur Photographer* competition, he had selected 300 prints as showing the faults usually given by the use of hydroquinone, and, on reference to the details given by the competitors, had found that in over 1000 instances his judgment was correct. When hydroquinone was used, he advocated the abolition of sulphite of soda, and advised the use of ammonia or carbonate of potash, with ordinary table salt as the restrainer when one was necessary in place of bromide of potassium. He considered that sulphite of soda was used in excessive quantities even with pyro. If negatives free from stain were required, they could be had by the use of the acid fixing bath. He referred to the theories of development advanced by Messrs. Hurter & Driffield, and mentioned the misunderstanding that had arisen in consequence of these gentlemen using the word density in a sense different from that in which photographers applied it. Having given a caution on the subject of thorough fixing, Mr. Wall boldly attacked the question of which intensifier to use according to the nature of the negative and the subject. In the conversation which followed many other questions were raised which Mr. Wall fully answered, and, on the motion of Mr. Marchant, seconded by Mr. Beadle, received a hearty vote of thanks. The competitions of views taken at the last two outings of the season to Higham Park, and the Rat's Haunt, Palmers Green, were held. Mr. A. J. Hewson was declared the winner in the former. The "Bynoe" printing frame was shown and price-lists of the Hill Norris Dry Collodion Plate, lists of new lenses, lists of chemicals from local dealers, &c., for which the Secretary tenders his thanks, were distributed. The next meeting will be held on October 10, when Colonel J. Gale will address the Society on technical points on picture-making, illustrated by the optical lantern. Visitors welcome.

Holborn Camera Club.—September 17, Mr. J. Stevens in the chair.—Mr. F. C. D. Beacham demonstrated the use of his patented pigments for spotting and retouching, and his liquid water colours for tinting photographs. With regard to the former, the pigments are put up in various forms—in crayons, cakes, or liquid. Any of them answer well for retouching purposes, and can be used upon the bare negative without either varnish or medium. For spotting prints the cake or liquid is used, and can be applied either before or after enamelling or burnishing. It can also be used dry for spotting platinotypes or bromides, and any other papers with a matt surface. Mr. Beacham also tinted some silver prints with his liquid water colours and a very satisfactory result was obtained. It seemed to be a very simple process indeed, and, if we cannot get photography in natural colours, we can tint our photographs afterwards and get something very nearly approaching it. On Friday, September 24, quite a large number of members' slides were thrown on the screen. The first were by Mr. F. J. Cobb, and among them were some of the Southern Counties Cyclists' Camp at Dorking this year, followed by some of Amersham and Chenies. Some by Mr. T. O. Dear followed, mostly studies of the Cyclists' Camp, and then a large number by Mr. J. H. Avery. Some of these were excellent slides, and included some of the upper Thames scenery, inland scenery, with a few animal studies. A small set by Mr. A. T. Ebsworth, all of the Cyclists' Camp, concluded a very pleasant evening.

Hackney Photographic Society.—September 20, Mr. F. Houghton in the chair.—Mr. B. Wire was nominated. The particulars of the last excursion of the season (to Hampstead) were given. A tea and smoking concert at the "Bull and Bush" was decided on. Mr. A. Barker showed prints he had executed with amidol on bromide paper. Mr. Carpenter showed some lantern plates he had made with it, also a print which, very thin, had obtained good platinum print with it. Other work was shown by Messrs. Pollard, Gosling, Dean, &c. The Developan Company then showed their speciality. Mr. DANDO was afraid the top glass (light) was not safe, but was informed that, as it was not directly exposed to the light, there was little danger of fog. In answer to a question from the Hon. Secretary respecting the suction of plate, it was said to be an advantage. Mr. Nunn then had the Developan handed to him for trial and report at next meeting. Mr. Carpenter showed a brown-paper "dark back." Some discussion ensued respecting the limit of attendances for competing in the exhibition, in which Messrs. Gosling, Beckett, Dean, Wesson, Barton, Dando, and others took part. Meetings are held every Tuesday at 206, Mare-street, not Morley Hall as heretofore, and the Hon. Secretary's address is now 12, King Edward-road, N.E.

South London Photographic Society.—September 19, the President (Mr. F. W. Edwards) in the chair.—A large number of prints from negatives made on samplee of Paget plates were handed in for competition for the President's award for the best picture. The President, who was assisted in the judging by Mr. Walter Woodbury, of the Paget Prize Plate Company, awarded the prize, a fine 12×10 platinum print of Shanklin Chine, to Mr. C. H. Oakden, and stated that Messrs. Buckle and Kelly followed close behind him in merit. Owing to illness at home, Mr. W. Groves was unable to read his paper on *Photography in Natural Colours*, and his place was filled by Mr. Mark Boxall, who, in the course of his remarks, dealt with all the *Recent Discoveries*, which by some were calculated to attain the desired end. In the end, the lecturer, in his usual characteristic style, declared that all the inventors were on the wrong tack, and stated that, if photography in natural colours was attained at all, in his opinion it would be through the agency of some of the tar compounds. Mr. Boxall's remarks were strongly criticised by several of the members present. By the courtesy of the importers, samples of "amidol" were distributed among the members, who were to report their experiences of its properties to the next meeting. Attendance, thirty-three.

Brixton and Clapham Camera Club.—September 20, Dr. Reynolds (President) in the chair.—The subject for the evening was *Exposure and Development*, the discussion on which was to have been opened by Mr. W. Bevins. In the unavoidable absence of this gentleman, Mr. J. A. Butler undertook to do so, and read a short paper, addressed principally to beginners, for whose benefit the meeting was chiefly intended. Referring to exposure, Mr. Butler said that this necessarily depended largely upon the aperture of the diaphragm used with the lens, and explained that, in order to form any correct idea upon the subject, it was necessary to ascertain the ratio of the aperture to the solar focus of the lens. In order to avoid complications, he advised the use of two stops only, *f*-16 and *f*-32, the former to be used when a short exposure was necessary, and the latter when time was no object. If this plan was adopted, and one kind of plate only used, he said a sufficiently correct judgment of exposure was rapidly and easily acquired. Besides the aperture of the diaphragm used, exposure was influenced by the distance, colour, and degree of illumination of the subject it was desired to photograph and the sensitiveness of the plate. The degree of illumination could be estimated by observing the height of the sun above the horizon and the state of the atmosphere. He advised that a full exposure should be given whenever possible, as it was only when this was the case that any control whatever could be maintained over the character of the negative during development, and said that the amount of latitude in exposure possible with plates of good quality was very great indeed, assuming careful development. For the developer Mr. Butler recommended the use of pyrogallol, potassium bromide, and ammonia in ten per cent. solutions, and said that the pyro could be preserved in solution for an indefinite period by the use of either potassium metabisulphite (half ounce to one ounce pyro) or sodium sulphite (four ounces to one ounce pyro), acidified with strong sulphurous acid. The character of the negative varied as development was allowed to proceed quickly or slowly. Rapid development gave a soft or even flat negative, slow development a vigorous or even hard one. Mr. Butler recommended the acid fixing bath, which could be made by adding a small quantity of bisulphite of sodium or metabisulphite of potassium to the ordiuary solution of hypo. Some discussion followed, in which many points of interest in development were touched upon, and, on the motion of the Chairman, the usual vote of thanks was passed to Mr. Butler. It was announced that the winter session would commence on Tuesday, October 4, and that meetings would be held on the first and third Tuesdays in each month. The dates for the annual exhibition of the Club were fixed for November 17, 18, and 19.

Croydon Camera Club.—One of the most successful of this season's field excursions was held on September 17, not because of the weather—which was, however, gloriously perfect for such an outing—but because of the conductor, Mr. B. Gay-Wilkinson. The morning was remuneratively spent near Limpsfield, where Mr. Wilkinson, with his characteristic energy, improvised a number of subjects for his followers to portray. These included such scenes as "Thumbit Lunch," and "Plough-land Work." In the afternoon Pains Hill was visited, and scenes illustrating "Gathering" and "Cottage Life" attempted. Mr. Wilkinson proved, as was to be expected, very unlike the ordinary conductor, who merely trots round with a party of perspiring picture-seekers, and whose ambition seems to be to break a record in distance covered, for he fulfilled the legitimate functions of a leader by not merely visiting interesting places, but by explaining, and to a large extent showing, by ocular demonstration, how the prosaic beauties of nature may be turned into poetical ones, or, at any rate, receive a palpable impress of artistic sentiment. The usual fortnightly Monday evening meetings begin on October 3. We understand an unusually interesting series of demonstrations and papers will be given during the winter, further particulars of which will be shortly announced.

Birmingham Photographic Society.—September 22, Mr. W. B. Osborn in the chair.—The Chairman announced that the Society was greatly indebted to Messrs. Morgan & Kidd who had generously presented a magnificent bromide enlargement of a portrait of the President (Sir J. B. Stone). The enlargement, which was made from a negative taken by Mr. Harold Baker, forms a conspicuous feature on the walls of the club-room. Mr. George A. Thomason then delivered a paper on *Stereoscopic Photography*. (See a future number.) A discussion followed, in which the Chairman, and Messrs. Griffiths, Iliff, A. J. Leeson, Owen, T. Taylor, E. Underwood, Watson, and G. Wilkes took part.

Brechin Photographic Association.—September 21, Annual Meeting, Mr. A. R. McLean Murray in the chair.—The usual reports of the Secretary, Treasurer, and Curator were submitted and appproved of. The Treasurer showed a balance in favour of the Society, and intimated that the debt incurred by the fitting up of the rooms had now been wiped off. The Curator showed that the lantern had been well taken advantage of during last winter, being borrowed by members on twenty-two different occasions. The following office-bearers were elected for the comiug year:—*President:* Mr. W. Shaw Adamson, jun., of Careston.—*Vice-Presidents:* Messrs. H. Braid and Bailie Lawrence.—*Committee:* Messrs. G. F. Robertson, B.Sc., J. Buchanan, A. Brown.—*Curator:* Mr. J. C. Middleton.—*Treasurer:* Mr. A. Innes.—*Secretary:* Mr. James D. Ross, 6, High-street, Brechin, N.B. The Association having been engaged during the past year in preparing slides to illustrate the manufacture of linen,

the slides ready were exhibited to the members. It was intimated that at the next meeting the Secretary would give a demonstration of *Enlarging on Eastman Bromide Paper.*

Liverpool Amateur Photographic Association.—On Thursday evening the formal opening of the beautiful new club-room was celebrated by an "At Home" given by the President, Mr. William Tomkinson, who gave a most humorous poetical effusion, specially written by Mr. Clarence E. Dyall. The Committee of the Artists' Club, whose rooms adjoin those of the Photographic Association, very kindly lent the use of their rooms for the occasion, thus enabling the President to invite the whole of the members (upwards of 300) and their lady friends. An excellent musical programme was contributed by Miss Anyon and Messrs. Cleaver, Yates, Bleu Rarn, Talbot Kelly, Anyon, Macready, and H. and W. Norman-Thomas. Mr. Yorke convulsed the audience with his humorous recitations. Mr. George E. Thompson gave his interesting new lecture on *The Roman Campagna*, illustrated by slides from negatives taken by him in the spring of this year. The lecture was listened to with great attention, frequent bursts of applause testifying to the appreciation of the crowded room. After an interval for refreshments, votes of thanks were accorded to all who had so kindly come forward to assist, and to the President or his entertainment. An impromptu dance, which was entered into with great spirit, brought a most enjoyable evening to a close.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 16,778.—"An Improved Process of Colouring Pictures especially applicable to Photographs." D. McNAB.—*Dated September* 20, 1892.

No. 16,902.—"Improvements in Automatic Photographic Apparatus." Communicated by E. Cheron and L. M. Mendoza. N. BROWNE.—*Dated September* 22, 1892.

No. 17,062.—"A New Kind of Plates and Photographic Paper for Instantaneous Prints." F. LISBONNE.—*Dated September* 24, 1892.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

"THE MALCONTENTS" AND THE PHOTOGRAPHIC EXHIBITION.

To the EDITOR.

SIR,—I have read the comments in the *Times* on the Photographic Society, which I feel convinced could not have been written by one of its staff. I am truly astonished that a paper of such standing should lend its columns to air the fancied grievances of a few disappointed men, deficient in gratitude for the many benefits received in past times from a Society they now condemn. The statements set forth are utterly false, and none know that better than the writer. The Society has never been more prosperous or firmly established than at present, and the Exhibition now open has been pronounced by competent judges and the public press to be the best ever held by the Society; and, although a few of the former exhibitors have abstained from contributing, their place has been amply filled by others, who surpass in some respects the absentees. I am not alone in this opinion.

The *Times* says: "It is rumoured that Captain Abney intends to resign at the end of his term." May I also add it is rumoured that the article is from the pen of a gentleman whose identity and connexion with the malcontents it is not difficult to recognise? With regard to this rumoured resignation, a rumour existing only in the mind of the writer, the President has always shown such great interest in the welfare, and worked so zealously for the Society, that he would scarcely resign at the bidding of a small band of discontents. His scientific duties falling heavily on him may perhaps influence his so doing, but he is much too reticent a man to inform all the world what his intentions may be.—I am, yours, &c., W. ENGLAND.

7, *St. James's-square, Notting-hill, W., September* 28, 1892.

[Some of the *Times'* comments and statements on matters concerning the Photographic Society of Great Britain and its Exhibition were so obviously of the *suggestio falsi* as well as of the *suppressio veri* kind, that we found it impossible to include them among our extracts of "opinions of the press" on the Photographic Exhibition.—ED.]

REVERSED NEGATIVES.

To the EDITOR.

SIR,—I myself was, I believe, the first professional using a negative from a negative for reversed images. The enclosed remarks I came across to-day, and send them for the benefit of any one requiring them. Finding I obtained a negative instead of a positive by contact, I set myself the task of finding out how it occurred. In making a few experiments to find at what stage of the exposure the reversal occurred, I exposed several plates behind a negative to the light of a paraffin lamp, three-quarter inch wick, with the following results:—No. 1, one minute exposure, very over-exposed positive; No. 2, three minutes exposure, gave a good negative; No. 3, two minutes exposure, developed as a positive, and just as I thought to discontinue the development it turned negative, and was very inferior to the one exposed three minutes. No. 4, four minutes exposure. This developed negative from the beginning, but the result not so good as No. 2. Plates used, Rouch's; developer, ferrous oxalate. I am now making them on Ilford plates, with an exposure of six seconds to bright sunlight, ferrous oxalate developer. I have found it a very simple matter, and can thoroughly recommend it. Mr. Howard Farmer has some I made some years ago, 1887, when a student at the Polytechnic, which were as good as the original, and sometimes they look better. E. FREWING.

26, *Eden-street, Kingston-on-Thames, September* 22, 1892.

FRENCH INVENTORS.

To the EDITOR.

SIR,—You are perfectly right in ridiculing, in your last number of THE BRITISH JOURNAL OF PHOTOGRAPHY, the idea of showing us the moon at one metre's distance, and that, too, by a Frenchman! If it were an Englishman, there would be some show of sense; but a Frenchman—pshaw! the idea!

What did your grandfather say when steamships and locomotives were mentioned to him? What did your father say about gas for lighting, and telegraphs? What did *you* say some thirty years ago about telephones and phonographs? And to-day you fall into the same trap, all ridiculing an idea, perhaps a little exaggerated—but don't say impossible. It is true it comes from France, and not England. Even Daguerre, if not an Englishman, was of English descent, as his changed name conclusively shows, it being originally Dagger—the English dagger.

Besides, you should not advance yourself so imprudently. The maker of the instrument may be one of those famous *photographic amateurs*, and there is no telling what such a man may produce.

Not more than a few months ago you were ridiculing Lippman—another English name, if any—and now some one improves on his idea in reproducing the spectrum.—I am, yours, &c., A. LEVY.

4, *Avenue Pinel, Asnières* (*Seine*), *September* 24, 1892.

[Nay, good friend, joking apart, we have never been slow in awarding credit to your countrymen for their invaluable inventions and discoveries in all that relates to photography; but (and we say it with bated breath) some of the inventions of *La Belle France*, not necessarily photographic ones, have not been such as to divest them entirely of the charge of having been impracticable, while, *per contra*, we have a hazy idea that certain emanations from English inventors and manufacturers have not quite proved failures, as an appeal to your own good memory and knowledge of what is being used in France will testify.—ED.]

HYPO-CARTRIDGES.

To the EDITOR.

SIR,—I see that a correspondent wishes to know where the hypo-cartridges are to be procured. I get mine from Messrs. Haacke & Albers, in Francfort-on-Main. They are sold in boxes containing ten, at 1s. 6d. per box. The ten cartridges are sufficient for sixty ounces, or two litres of fixing solution. They contain four parts of hypo and one part of acid bisulphite of soda—not metabisulphite as your correspondent supposes. They render the use of an alum bath after developing quite superfluous, and the solution remains bright and limpid until exhausted, which may be known by the very slow disappearance of bromide of silver from the negative. They are *most* convenient, and I am never without them.—I am, yours, &c. ETHEL C. MAY.

Darmstadt, September 26, 1892.

Exchange Column.

Wanted, background, burnisher, or changing bag, in exchange for *carte* portrait lens.—Address, J. G. BRADER, Hemingby, Horncastle.

Exchange 5×4 (No. 4) Regular Kodak for gentleman's gold lever watch and chain.—Address, A. VALENTINE, 30, Daubury-street, London, N.

I will exchange 12×10 camera with three double dark slides for a cabinet lens.—Address, H. L. MOSEL, Angel-row, Market-place, Nottingham.

Wanted, cabinet portrait lens of good make in exchange for whole-plate portrait lens by Lerebour.—Address, JAMES LEDGARD, Camm-lane, Mirfield, Yorks.

Will exchange Lancaster's Multum-in-parvo enlarging apparatus, 15×12 size, for some good rackwork slides.—Address, P. J. LEEMANN, Photographer, Mold.

Wanted, a half-plate rectilinear lens in exchange for Marioo's largest size registered washing apparatus.—Address, H. A. M., 16, Waterloo-place, Sunderland.

Will exchange 10×8 portrait lens for either 9×7 Euryscope or 10×8 rapid rectilinear Optimus; specimens submitted.—Address, ROBERT C. DAWS, Lock View, Bingley.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

Edwin James Hopgood, Northampton.—*Portrait of Amos Jinks.*

James Downey & Sons, South Shields.—*Portrait of Mr. Emmanuel Lasker.*

John Ellis, Nottingham.—*Portrait of William Thompson, alias Bendigo, with trophies.*

Isaac Slater, Llandudno.—*Photograph of a group of the Right Hon. W. E. Gladstone and party taken at the Chalet, Beddgelert. Mr. Gladstone addressing the mass meeting at Cumllan, Snowdon, on September 13, 1892. Mr. Gladstone and party at the Chalet, Beddgelert. Mr. W. J. Williams conducting Welsh Choir at the mass meeting, Cumllan, Snowdon, on the occasion of Mr. Gladstone's Visit.*

A. JACKSON.—Study *Photographic Chemistry*, by Hardwich & Taylor.

A. J.—Yes; a ten-grain solution means ten grains of gelatine to one ounce of water.

F. HAMILTON.—Mr. Redmond Barrett's work has not been reproduced in book form.

R. WATKINS.—If the pyroxyline yields a crapy film when dissolved in strong ether and alcohol, it is not at all adapted for bromide emulsion, or, indeed, any photographic purpose.

F. G. PACKER.—1. We do not know the address of any other makers of dry collodion plates than that of the firm named. 2. Yes. 3. Mr. H. P. Robinson's work on *The Studio, and what to do in it.*

NESTOR.—Unless the paper is more highly salted than most albumenised papers now are, no advantage will be gained by increasing the strength of the sensitising beyond that you are now using. The increased cost would not be met by a compensating advantage.

R. W. (Yorks).—Too late now. The Exhibition opened on Monday last. Examples of the new process will prove interesting, if shown at the ordinary meeting of the different societies. It will by this means gain a certain amount of publicity, which we presume is your chief object.

W. D. B. asks: "Can enlargements be made by the electric arc light on carbon, platinum, or the new printing-out chloride paper? If so, what candle power would be required?"—The thing is quite possible, but a very powerful light and a long exposure would be required which would make the method impracticable, on account of the cost, for commercial purposes. If enlargements by the processes are required, the best way is to make enlarged negatives and print from them in the ordinary way.

ALF. DOWNES.—It must not be assumed, at the present time, because methylated spirit becomes "milky" on the addition of water, that it contains resins, or is what is known as "finish." Under a recent regulation all methylated spirit sold in small quantities must contain a certain proportion of mineral naphtha, and this in itself, on the addition of water, will cause turbidity. If the article was obtained from one who is licensed to sell methylated spirit, the probability is that it is free from resins.

R. E. COLE writes: "In working with the hand camera I always use the quickest plates I can get, and have tried all the best brands. My complaint is that with all of them the image is so coarse and granular. When I use ordinary plates, even of the same brands, it is always very different, being fine and delicate. Must one always have a coarse image if highly sensitive plates are used?"—Highly sensitive plates, as a rule, give a much coarser image than slow ones, though some makes, with equal rapidity, give a finer deposit than others.

W. SAYER says: "I have put up a small studio in my garden for figure studies, but while at work I am greatly annoyed by the children next door staring in and laughing at the models. I have painted over the glass so that they cannot see through, but that seems to stop out too much light. Is there any medium, other than ground glass, that will admit all the light, and yet cannot be seen through?"—If the studio, or such portions of it as are exposed to the annoyance, be glazed with transparent fluted glass, there will be no loss of light, and nothing can be distinguished through it from the outside.

D. DUMERY write: "Herewith part of 12×10 print which, after examination, you will find full of spots, trusting to your superior knowledge to find out the cause, for I have never met with such in all my fifteen years' experience. The paper we have been using these last three weeks is Saxe of the finest make. The toning bath is the ordinary chloride and acetate, and the sensitising bath is fifty grains, fixing and washing the same as we have done these seven years. On returning from my holiday, the printer called my attention to these spots, and told me that they had made their appearance gradually. I at once had dishes, trays, tanks, and washing machine well cleaned, and we have been free from them for five days, when they made their appearance again this morning, spoiling fifty or more prints, all sizes. You will find a piece of the paper ready-sensitised and the part of the finished print."—The spots appear to be due to particles of foreign matter coming in contact with the surface of the paper at the time of sensitising or while it is drying, and reducing the silver to the metallic state. They are not in the paper itself or they would show on the back, which is not the case. Particles of foreign matter, in the form of dust, are constantly present in all work-rooms which are not kept scrupulously clean, that would cause spots similar to the ones complained of.

S. A. E.—The flat appearance of the portraits is due to the models being illuminated with a direct front light, so that there are no shadows to give rotundity to the pictures. Stop off the direct front light, and illuminate the sitters from one side, softening the cast shadows, if necessary, with reflectors.

LANTERN SOCIETY.—First Meeting of the season, Monday, October 10 The slides, *Going to America*, will be shown.

HACKNEY PHOTOGRAPHIC SOCIETY.—The arrangements for October are:—October 4, Open Night. Bring apparatus and work. 11, Members' Lantern Night. 18, *Photography without Studio*, Mr. S. H. Barton. 25, *Flashtight Photography*, Mr. R. Beckett.

IN the course of his able practical discourse on *Retouching* before the North London Photographic Society, on Tuesday week, Mr. Redmond Barrett drew attention to the qualities of Messrs. L. & C. Hardtmuth's retouching pencils, of which he spoke highly for the purpose.

*** OWING to pressure of Exhibition matter this week, we are obliged to hold over "Stereoscopic Photography" (G. A. Thomason), "A Reminiscence" (Valentine Blanchard), and other articles, together with several answers to correspondents, &c. These in our next.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—October 1, "Winding up" Outing to Hampstead, "Bull and Bush," half-past three. 6, *Various Printing Processes*, by Mr. B. Foulkes Winks. 13, *Practical Demonstration on Retouching*, by Mr. Redmond Barrett. 29, First Lantern Night, and Competition Slides.

PHOTOGRAPHIC CLUB.—October 5, Exhibition of Slides from Negatives taken at the Edinburgh Convention, and report of the delegates. 12, Members' Open Night. Saturday next, October 1, Last Outing of the season, Hampstead Heath. Meet at the Flagstaff at two, group at "Bull and Bush" at four, tea at half-past five.

WE have had submitted for our inspection some ivory miniatures, together with other portraits, painted by Miss Miriam Twyman, of 3, North-villas, N.W., both from photographs and life, one—an exhibition picture of the late Duke of Clarence—being a most pleasing likeness of the young Prince. All the pictures are of remarkable elegance and finish.

STATUARY PHOTOGRAPHS.—A few weeks ago we published the specification of a patent obtained by Messrs. Bradshaw & Co., of Altrincham, for combining the head of a living subject with a statuary bust. Several examples of Messrs. Bradshaw's work have since been submitted to us. The junction of the head with the bust, of the living with the dead, is effected in a most admirable manner, and some excellent effects have been produced.

WE alluded some weeks ago to the opening of a series of limelight lectures, inaugurated by the Glasgow Institute of the Fine Arts. These were instituted in response to a very general demand last year for such entertainments, and we are glad to say that they have been very successful. On Thursday, September 22, Mr. George Mason gave his lecture in this series on *Mary Queen of Scotts—her Palaces and Prisons*, which was well received by a large and enthusiastic audience. The subject was well handled, and peculiarly suited to a Scotch audience. The larger proportion of the pictures were taken by Mr. Mason at the various places represented, which gave them an enhanced value.

IN last week's JOURNAL, in our *Run Through some of the Scotch Studios*, a rather strange printer's error, in the description of Mr. John Fergus's place, occurred. We are made to say that he opened a business "in cameras," when it should have been in Cannes. Can anything be funnier than to suppose Mr. Fergus had turned cabinet-maker? We hasten, however, to put the matter right, although we have no doubt that the cause of error, and what was really meant, would be seen at once by the general reader, who is familiar with the facts that all the world knows. And in the Swan Watson article we say he built the studios. Now, we find this is a mistake on our part. The studios were built by Mr. Shaw, and, on his retirement, bought by Mr. Watson.

As previously announced, we propose, during the months of October, November, December, January, February, and March, issuing with THE BRITISH JOURNAL OF PHOTOGRAPHY *a gratis supplement, devoted to the interests of the makers and users of the optical lantern and its numerous applications. The first supplement will appear with the* JOURNAL *of Friday, October 7 next. The growth in utility and popularity of the optical lantern, its increasing importance as an adjunct to amateur photography, its manifold advantages to the photographer, the scientific investigator, the lecturer, and many others, more than justify the institution of a special department of* THE BRITISH JOURNAL OF PHOTOGRAPHY *in which the topic in all its phases can be exclusively treated, besides rendering the interests of the many commercial firms now engaged in the manufacture of lanterns and their many accessories so considerable as equally to demand increased facilities for their separate representation.*

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1692. Vol. XXXIX.—OCTOBER 7, 1892.

The Almanac for 1893 is already in course of preparation, and we shall be happy to receive short contributions on practical subjects from those who in former years have enriched its pages with the results of their experience and practice in the photographic art. Not less cordially also do we invite the newer supporters of The British Journal of Photography and its Almanac to include themselves among the contributors to the Annual which for many years past has been highly esteemed for the valuable writings of numerous able photographic workers.

As we were compelled last year to omit several interesting articles from the Almanac on account of the late dates at which they were received, we should be glad if intending contributors would endeavour to send us their articles *as early as possible.*

Secretaries of Societies, and particularly of those established since the appearance of the last Almanac, would, if they have not already done so, oblige us by forwarding lists of officers and other details for inclusion in the Directory of Photographic Societies in order that the list may be made as complete as possible.

The Publishers desire us to inform intending advertisers that the announcement pages of the Almanac are rapidly filling up, and that in order to avoid disappointment it is essential that copy and orders for advertisements be transmitted to them without delay.

REVERSED NEGATIVES.

The phenomenon of reversal forms the theme of many speculations, and is even understood to such an extent as to be producible at will. Yet so far, although the latter circumstance distinctly raises the inference that it is capable of practical application in the production of reversed negatives, but little advantage appears to have been taken of it. This is all the more remarkable when we consider the many occasions on which negatives reversed as regards left and right are required for photo-mechanical printing purposes. Again, for the duplication of negatives and positives there are possibly features in the method which entitle it to consideration.

By a communication from a correspondent in our last number, nevertheless, we gather that at least in one instance reversed negatives at one operation are successfully obtained by the solarisation method, and from the particulars which that gentleman, Mr. E. Frewing, gives of his mode of procedure, we conceive that we are justified in once more drawing attention to its practical possibilities.

As in every other contact reproduction process when first submitted to trial, the uncertainties attendant upon the exposure, which varies with the character of the negative, the rapidity and other qualities of the plate, and the actinic force of the light, interpose difficulties which only some experience and consideration enables one to surmount. That experience, however, is not, as we have said, difficult to acquire with a little care and assiduity in paying regard to the conditions above described.

The real difficulty of this method—at least, in our experience—has been that of the development of the pictures. So far as we can recollect, in all published accounts of experiments, and certainly in our own attempts, the developer employed has usually been alkaline pyrogallol or hydroquinone. But these developers, we have more than once satisfied ourselves, are far too powerful for the development of solarised negatives or positives, the half-tones of the picture being thereby shrouded in fog, as well as the whole surface of the plates becoming degraded with veil. This can easily be accounted for by the known liability of alkaline pyrogallol at normal strength having probably the greatest reducing power over both exposed and unexposed silver haloids, and at the same time explains its tendency to fog a solarised image.

The *data* for exposure which Mr. Frewing supplies should enable one to arrive at a correct time after a few trials; but, to our thinking, the kernel of his communication lies in the circumstance that he employs ferrous oxalate as a developer. Now, ferrous oxalate, it is hardly necessary for us to point out, of all developers in actual use, is at the bottom of the scale on several heads. In cases of under-exposure, its powers are much circumscribed; its density-giving qualities are not so easily brought out, as those of other developers; in over-exposure, it is correspondingly inert, while it attacks the unexposed film with infinitely less energy than other developing reagents. In fact, its very drawbacks in ordinary negative work are those which in the case under notice are likely to be most efficacious.

Herein probably lies the secret of Mr. Frewing's success, to the particulars of which we draw attention in the hope that others will repeat his experiments. For, as we have before remarked, it is obvious that the plan is available for other purposes besides the production of reversed negatives.

CARBON PRINTING.

As a feather cast upon the waters shows the direction of the tide, so the annual Exhibition of the Photographic Society of Great Britain may be taken as an indication of the advancement or otherwise of different photographic processes. Allusion

was made last week to the fact that the carbon process is better represented in Pall Mall this year than it has hitherto been. Therefore it may well be assumed, with other knowledge we are in possession of, that the process is now being more extensively worked than at any previous period, not only for large sizes by the profession, but also amongst amateurs for small work. It is not at all surprising that this should be the case when it is considered that, apart from the undoubted permanence of the prints, a greater variety of effects—now so much in demand—are to be obtained by it than by any other process, or, indeed, by all the other processes combined.

There is not a process that will yield effects that cannot be got equally as well by the carbon method, while by it many others can be secured that would otherwise be impossible. When all these advantages are enumerated, some of our younger readers may—and not unnaturally—inquire why a process combining so many qualifications was not more generally taken up by photographers in the past. For their information on this point a few words may not be out of place, as it will explain the different conditions of working then and now.

When the carbon process was first introduced, now some thirty years ago, it was the subject of a patent, and heavy charges were made for licences, while, at the same time, the process was troublesome to work. For example, the exposed tissue had to be cemented to paper with indiarubber for development, and afterwards transferred to its permanent support by treatment with benzol. At that time the only real advantage that could be claimed for the process over those in general use was permanence, while the quality of the results, for small work at least, was inferior to what could be obtained in silver. Simplifications followed, indiarubber was dispensed with, the single transfer method was introduced, and was generally adopted for large sizes.

Some sixteen or seventeen years ago considerable impetus was given to the process by an ingenious Frenchman, M. Lambert, who demonstrated that by his modified method of working small prints could be produced which were quite as good as, if not really better than, those on albumen paper. This modification was vigorously exploited by him, and at the time some were sanguine enough to predict that the knell of silver printing was sounded. Progress was, however, considerably impeded again by patent rights, and the way in which they were dispensed. Exclusive licences were granted for certain towns and districts, the purchasers of which could not, or would not, take the trouble to learn how to master a, to them, new process, while others were precluded from working it by these exclusive rights. In some instances licences were taken without any intention of adopting the system, but simply to prevent more enterprising rivals from taking it up. With regard to amateurs, at this time licences were also requisite, but they were eventually granted at a merely nominal fee.

All patents in connexion with carbon printing have long since expired, so that now the process is open to all. It is only within the past two or three years that the simplicity of the carbon process has been fully realised. Indeed, by some, it is even now considered to be a troublesome one. This is clearly proved by the remarks often heard during the several demonstrations that have been given before some of the newer societies, which are chiefly composed of amateurs and young beginners. Most persons seem surprised, when they see the method worked for the first time, at its exceeding simplicity.

At the present time, amateurs and workers on a small scale are relieved of one of what used to be the most troublesome and uncertain of the operations, namely, the sensitising and drying of the tissue. Some little time ago the Autotype Company—and the example set by them has been followed by other firms—commenced to supply the tissue in small quantities, ready-sensitised, cut to the standard sizes, and in the proper condition for use. This has conduced more than anything else to popularise carbon printing amongst small workers. Sensitising tissue is a somewhat messy operation, and those familiar with the subject know quite well that the drying of it, so as to obtain it uniformly in its best working condition, is a somewhat ticklish operation without suitable arrangements. It used to be said, and not without reason, that more skill was required in sensitising and drying of the tissue than in any other portion of the work. It will now be seen why the practice of carbon printing has of late become so much more popular, and promises to become still more so amongst amateurs and others aiming at variety of effects.

By the carbon process pictures can be obtained in every conceivable colour, with any surface—from the highest enamel surface to that of the roughest of drawing papers—and, indeed, on almost any material. If the single-transfer system be adopted, it becomes one of the most, if not *the* most, simple printing process to work. The exposed tissue is merely squeegeed on to the paper, then treated with warm water until the image is sufficiently developed. A short immersion in a solution of alum and a final rinse in water complete the work, while an absolutely permanent picture is secured. Where is a simpler process than this? True, for single transfer, a reversed, as regards left and right, negative is necessary, but negatives on celluloid fulfil this condition, if they be printed through the celluloid. With the thicker films there will be, practically, no loss of sharpness if the exposure be made to a tolerably direct light, and with the thinner ones any light will suffice to secure sharp impressions. Objections to carbon printing have been raised by some who have in times past decried the process, because the image cannot be seen while printing; therefore the correct exposure cannot be judged. In doing so, however, they quite overlooked the fact that the same remark would apply equally well to the taking of negatives, the use of bromide papers, and other photographic operations.

In the carbon process the latitude in exposure is so great that an error of fifty to a hundred per cent. either way does not really mean the loss of the print, it is merely a question of time and temperature in the development. Furthermore, in this process the print, when wrongly exposed and made right in the development, is of the same colour and tone as that of those which have been correctly timed, a condition that does not obtain in any of the silver processes.

A NOTE ON STANNOTYPE FOR TRANSPARENCIES.

In our editorial article a fortnight ago on *Stannotype*, although mention is made of the necessity for the double safe edge and also of the high lights of the transparency being as clear glass as the safe edge, it has been suggested to us that scarcely sufficient empasis was laid on this, for lantern slides especially, all-important point.

We are too prone to consider that a negative or a transparency, if in correct gradation, may be *copied* perfectly, although a veil or slight fog may exist in the original, and such may, indeed, be the case in ordinary copying, but not so

with Stannotype. The high lights *must* be absolutely clear glass, for this very cogent reason.

The clear glass "safe edge" of the transparency, from which the gelatine relief is made, represents the greatest possible action of the light, and, consequently, it forms the thickest or highest portion of the relief; and, extending as it does round all four sides, it regulates, not only the depth of the relief, but also its evenness of thickness. Upon the wall or ridge formed by the safe edge the platen of the printing press rests when screwed down, and the print is formed by the gelatinous ink solidifying in the hollows lying below its level.

It requires but a moment's thought to convince one that, if the high lights of the transparency are veiled, the light, in printing the relief, does not act so powerfully as through the clear glass "safe edge," and, consequently, the highest lights in the printing would stand at a lower level than it is possible to screw the press down to. It follows as a matter of course that no variation in the density of the ink and no alteration in the pressure will avail to prevent a layer of coloured gelatine between the high lights and the paper or glass support of the picture and the consequent tinting or degradation of the whole image.

It is easy to realise the extreme importance of this matter when it is put in this way, and the late Mr. Woodbury used to demonstrate how slight a veil in the transparency served to ruin the relief. When we remember that for decorative, and even for ordinary, copying purposes some people claim that a slight veil in a transparency is an advantage, we think it is important for this purpose to point out the difference.

For amateurs' use, the method of making tissue preferred by Mr. Woodbury will be found more convenient than the one given in our previous article. It differs only in that the pigmented gelatine, without bichromate, is poured on to paper, previously damped squeegeed on to levelled glass, instead of on to collodionised glass. This enables the "tissue," when "set," to be stripped from the glass support, so as to have the great advantage of drying from *both* sides. In order to prevent its "cockling" in drying, Mr. Woodbury used to fix the edges between light frames, hinged in pairs like a double slide, which, while keeping it straight, allowed free access of air. A slight advantage is also probably gained if there should be any dust or other particles in the gelatine, as these will settle down in contact with the paper, which is the portion of the gelatine film that is washed away in development. On the other hand, there is the risk of dust particles attaching to the other or picture-forming surface. The bichromate may or may not be added to the coloured gelatine, but, from our own experience, we think the method of separate sensitising will be found most convenient for amateurs.

A New Curve Measurer for Lenses.—The accurate measurement of the curvature of a lens is a matter of great importance to the practical optician, and an intrument termed a spherometer is used for the purpose. Certain disadvantages attend the use of existent instruments, but recently the Zeiss Company have made a new apparatus, after a design by Professor Abbé, which is of such delicacy as to be able to measure to the twenty-five-thousandth of an inch. The accuracy and delicacy of the instrument is such as should render it of very great value.

A New Method of Packing Plates.—Mr. A. Cowan has lately shown a method of plate-packing, which we believe has been successfully in use for some time by Messrs. Marion. The device employed is simply that of cutting through the backs of the plates without separating the films. This allows of two plates—say, two quarter-plates from a $6\frac{1}{2} \times 4\frac{1}{4}$—being folded face to face and packed in that state. Mr. Cowan has practically demonstrated that, given accuracy of cut, there is no abrasion of the films to be apprehended, while they may be easily separated as wanted without the slightest fear of tearing. Obviously, for smaller sizes, no better system of packing could be devised.

Photography in Lunatic Asylums.—It is stated that occasionally difficulties arise about the identity of persons committed to public asylums should death take place while they are retained as patients. In consequence of this, the Asylums Committee of the London County Council have now given directions that each patient shall be photographed on arrival at the asylum. This has necessitated the provision of the necessary apparatus, and at Colney Hatch a studio is being built, and one of the officials has been appointed photographer. The cured patients on leaving will, it is further mentioned, also be photographed, and it is possible that a comparison of the two photographs will be of interest to scientists. We trust, however, that such photographs will be strictly confined to scientific scrutiny. It would add a new terror to the existence of the poor if it were known that their counterfeit presentments, taken while they were in a condition of temporary insanity, were afterwards to fall into any but responsible hands.

A Practical Method of Timing an Instantaneous Shutter.—Under this heading a letter was recently published in the columns of the *English Mechanic* which contains much useful matter to those interested in this subject. Discussing unfavourably to its merits another project, the writer, Mr. J. B. Bent, of Oldham, suggests the use of a long pendulum, say a bob of lead at the end of a light wire twelve feet long (using wire to prevent any rotation of the bob):—"Attach a silvered bulb to the centre of the weight. It can then be shown that, if the bob of the pendulum be pulled sideways until it is two feet five and a half inches from the line of wire when at rest, the velocity of the bob at the lowest point will be four feet per second. This will vary very slowly about the lowest point of the swing, so that it will not matter if the shutter is not opened at *exactly* the lowest point." It is obvious that a little careful measurement of the plate exposed under these conditions would give with a very fair amount of accuracy the time of exposure.

Stills and the Excise.—Many photographers are in possession of small stills with usually Liebig's condensers, for the production of distilled water of ascertained purity, and a good proportion of this number are unaware of the probable existence of any Excise regulations that render such stills illegal. The Council of the Institute of Chemistry have taken this matter under their consideration, and have written to the Inland Revenue authorities in regard to the matter. They have received a reply which we think may advantageously be brought before our readers:—"Having laid before the Board of Inland Revenue your letter of the 27th July, I am directed in reply to acquaint you, for the information of the Council of the Institute of Chemistry, that the Board have no desire to extend the obligation to take out a licence to analytical chemists using stills solely for the purpose of distilling water. If an analytical chemist called upon to take out a licence by one of the Board's officers will submit his cause to the Board, they will be prepared to give the matter careful consideration." It will be seen by this that the necessity to take out such a licence by any one holding a still of a certain size is by no means looked upon as a dead letter. It would be, therefore, no ill-advised step if the Council of the Photographic Society of Great Britain would follow in the footsteps of the Institute of Chemistry.

Solubility of Silver Salts in Alkaline Haloids.—Herr C. Schierholz, in an article in a foreign technical journal, regarding the separation of the halogens, describes how, incidentally, he has investigated the solubility of the halogen salts of silver in the

halogen salts of the alkaline metals. Photographers have long been aware of the solubility of silver iodide in solutions of either silver nitrate or iodide of potassium. It has also been common knowledge that sodium chloride solutions would take up an uncertain amount of silver chloride, but the governing conditions were little understood. Herr Schierholz has thrown some light on the matter. He finds that the solutions referred to dissolve four or five times as much of the silver salts at their boiling point as they do at the ordinary temperature of the atmosphere. Further—a fact familiar to old wet-plate workers—in one direction at least, the concentration of the solutions has a marked effect on this "insoluble" silver salt; for example, a ten per cent. solution of sodium chloride and a one per cent. of potassium iodide dissolving scarcely any of the corresponding silver compounds. The very great difference between chlorine and iodine is shown both in the relative solubility of silver chloride and silver iodide, and in the different solvent powers of the halogen alkali salts on silver nitrate, chloride, &c., the powers of bromide lying between the two. He gives us instances:—A twenty per cent. solution of sodium or potassium chloride which dissolves hardly a trace of silver iodide, whilst potassium iodide in concentrated solution dissolves ninety per cent. of its own weight of silver iodide, which is increased four or five times when the potassic solution is raised to boiling point. One peculiarly interesting point he elucidates is that mixtures of these alkaline halogen salts in particular proportions are unable to dissolve as much of the silver salt as each can before admixture. To a certain extent the above investigation would appear to show that the old theory about the relative value of sodium chloride and hydrochloric acid for throwing down the silver from waste solutions will have to be reconsidered. But, whether or no in practice salt solution does or does not dissolve any of the silver precipitate, it is certain that quite apart from any of the improvements recently suggested, the use of the acid facilitates the deposition of the precipitate.

ESTIMATION AND DEHYDRATION OF SILVER OXIDE.

[American Journal of Science.]

In some analytical determinations it became necessary to estimate silver oxide, and the question arose at what temperature the moist oxide could be most perfectly dried, and also at what temperature it began to lose oxygen? As no such data are to be found, they had to be determined, and the results obtained may possibly be of use to others.

Moist oxide precipitated by perfectly pure sodium hydrate obtained from metallic sodium, and thoroughly washed, was dried at 100° C. for twenty hours. Of this material 1·5528 gramme were taken and heated again to 100° for twenty more hours, after which heating it weighed 1·5524, a loss of 0·0004 gramme. It was next heated to 160°–165° C. for five hours, and was then found to weigh 1·538 gramme, a loss of 0·0135 gramme. It was then replaced in the oven, and heated five more hours. No loss whatever of weight could be detected resulting from this third heating. The oxide was then ignited, and gave 1·4358 gramme of silver.

Taking the atomic weight of silver at 107·66 and O=16, argentic oxide should contain 6·92 per cent. of oxygen (more exactly 6·917).

From the foregoing it follows that moist silver oxide dried for forty hours at 100° lost by ignition	7·51	per cent.
The same oxide with ten hours' drying at 160°–165° C. lost by ignition	6·70	,,
Calculation for Ag_2O gives for O	6·92	,,

It follows that after forty hours' drying at 100° the oxide had reached a constant weight and still retained 0·59 per cent. of moisture. When heated to 160°–165° till constant in weight, it had lost the 0·22 per cent. of oxygen.

It was next attempted by a shorter second heating and a lower temperature to expel the water alone. Silver oxide was dried for twenty hours at 100° and was then heated for two hours to 130°–135° C. Of this oxide 1·8043 gramme was ignited and left 1·6701 gramme of silver, indicating a loss by ignition of 7·44 per cent. This was only ·07 less than when the heat was not raised above 100° C., showing that the oxide is not dehydrated by exposure to a temperature of 130°–135° C.

The conclusion to be drawn would apparently be that the point at which the last portions of water were driven off was very close to that at which oxygen began to be disengaged. It can be shown, however, that this is not so, and that oxygen is lost long before the last portions of water escape. This can be proved by the delicate photo-chloride reaction, which I described some years ago. If the silver oxide dried as above described at 100° C., till it reaches a constant weight, is moistened with dilute hydrochloric acid, a chloride is obtained, of a deep lilac colour. This colour always denotes the presence of hemichloride, due to the fact that a certain portion of the oxide had been reduced to hemioxide. The hemichloride combining with the white chloride forms a photo-chloride characterised by the colouration just mentioned.

A really accurate estimation of silver oxide is therefore impossible, as it loses oxygen too easily.

Silver oxide is not supposed to form a hydrate; nevertheless, some portion of moisture remains united with it more strongly than some part of the oxygen, with which it combines to form a strong base.

But it also appears that the loss of oxygen is very small and soon ceases, even at 160°–165° C., for, after five hours' exposure to that temperature, the weight became constant.

M. Carey Lea.

AMERICAN NOTES AND NEWS.

Retouchers' Associations.—Several of these are being formed in the United States, and that at St. Louis, Mo., is said to have a good membership. The object of the Association, according to Mr. R. W. Drew, Secretary of the Order, is "to elevate the photographic business, to secure help for those who need it, and to find positions for the members who are out of employment." An excellent programme.

A Bureau for Testing Lenses.—The *American Journal of Photography* enters a plea for the establishment in America of a *bureau* "to which one can send a lens to be examined as regards its definition, distortion, focal length," &c., and hints that such a *bureau* may shortly be opened in the near future if there is a sufficient demand for it. No doubt such an establishment would be modelled upon the lines of that recently instituted at Kew.

"Diffusing" Plates.—The half-tone screen-plates used by photo-engravers are being applied to photographic portraiture in America. The screen is placed before the plate which is to be exposed, the result being, upon development, a negative broken up, which, when printed, produces a portrait resembling a half-tone photo-engraving. Specimen prints by this method recently appeared in one of the Canadian photographic journals. The idea is tolerably old, but the effects are pleasing variations in portrait photography.

A Star Camera.—The star camera in use by Professor Russell, Government Astronomer at Sydney, is said to be in some respects unique. It has two combinations of lenses for use in the enlarging camera, one having a magnifying power equivalent to a focal length of 47 and the other of 180 feet. Very satisfactory pictures of the moon, says *Anthony's Bulletin*, as large as five and a half metres in diameter can be made with the former in from three to four seconds, though it has proved more advantageous to reduce the aperture and increase the time to about twenty seconds. The enlarging lens is constructed of two lenses of equal focus, mounted convex sides together, and separated five-eighths of the sum of the foci of the two.

Magnesium as a Source of Light.—Mr. Frederick J. Rogers, in the *American Journal of Science*, after pointing out that the spectrum of burning magnesium approaches more nearly to that of sunlight than does the spectrum of any other artificial illuminant, says that the temperature of the flame, about 1340 deg. C, lies between that of the Bunsen burner and the air blast lamp. The "radiant" efficiency (the ratio of luminous energy to total radiant energy) is higher than that for any other artificial illuminant, with the exception of the electric discharge in vacuo; while the total efficiency of the magnesium light is about 10 per cent. as compared with a quarter of one per cent. for illuminating gas. He concludes that it is certain that per unit of energy expended, the light-giving

power of burning magnesium is from fifty to sixty times greater than that of gas.

Drawing Photo-micrographic Objects.—According to *Anthony's Bulletin*, Dr. H. G. Piffard has done much to simplify the drawing of photo-micrographic objects, by means of his application of the prism to the microscope. His method is to insert a right angle prism by means of a short tube in the place of the eye piece of the microscope, and on one of the square faces of the prism another short tube to hold the ocular. The object then having been placed upon the stage and focussed, a piece of plain drawing-paper is placed under the ocular and the room darkened, when a brilliant image will be apparent on the drawing-paper. It is evident that in this way the artist has the advantage of perfect freedom both of his eyes and hands in his work, and can trace the minutest detail with ease and accuracy.

Wants to be a Photographer.—The following letter was lately received by our *confrères* of the *American Journal of Photography*:—"Mister Editer, Sir, Please unt let me a know wat a compplead fotegraf outfids will cost me, mabe camera, chemicals, unt all complead to make picters wid from 3¼ × 3¼, 4 × 5, 4¼ × 6½, 6½ × 8½ i would likes to stard in de bisness as I never had no expereance, vould likes you to gives me some informations i got I of your Journals unt looks dru de pak for were to puy one camera's und ader dinks. Now pleas unt dells me vich of dem cameras can I takes pictures in a room wichout skye lite, tells me can I take a biuldings picture clear on cloudy weathers, pleas unt kin I takes gems & tintypes wichone cameras I vold likes to take tintypes unt outher pictures pleace unt fine the price all complte how much money I want to start in do dink you can tel me all aboud id so I can makes a compplead pictures ov my own expereances i am a mittle age man unt got a gute schul edencations give me full information unt I vill starts rite in."

A SERIOUS BLOW-UP: A REMINISCENCE.

The recent disastrous collodion explosion in Paris so vividly recalls a terrible experience of my own that I cannot help writing about it. The event referred to in your pages of September 16 took place more than twenty years ago, and yet it is as vividly before my eyes at this moment as though it had occurred only yesterday.

As collodion is still largely used by enamellers and others, and there is a collodio-bromide dry plate process looming in the dim future, a narrative of the drama by the chief actor left to tell the tale may serve a good purpose in showing modern workers that this useful compound, though a good servant, is a terrible master.

Many of the old readers of this Journal will remember that, twenty years ago, I manufactured collodion in considerable quantities for sale, and that it was largely used by the photographers of that period. The operations involved in the manufacture of collodion in large quantities are anything but agreeable. First, there is the manufacture of the pyroxyline, which for modern readers may be called a mild form of guncotton—though its mildness will soon disappear if it be ignited when confined in any earthenware jar, and I hope, therefore, my readers will take my word for it, and not make the experiment—and is made by acting upon cotton with a combination of nitric and sulphuric acids. When separate, the latter acid gives off no fumes, and those from the nitric acid are only noxious when very near to them; but when these acids are combined, heavy fumes of the most deadly character are given off, and with every possible precaution to convey them into a flue, some will get down the throat and into the lungs, and to this day I have an irritating affection of the mucous lining of the nostrils and throat which is chronic, and is no doubt due to the action of these combined acids all these years ago. It will be seen, therefore, that the manufacture of this necessary ingredient in the compound called collodion is not at all a desirable occupation. So much, therefore, for the pyroxyline; now for the mixture.

Certain proportions of alcohol and sulphuric ether are combined, and into this is introduced the pyroxyline, which, if properly made, will be perfectly soluble in it. In small quantities this is a very simple operation, and gives no trouble; but where many gallons are made at a time matters are considerable changed. The decanting of the alcohol into the mixing vessel is bad enough, for it produces the same effect on the wits as a very small quantity, disguised by flavour and called brandy, would do if taken internally, diluted with hot water and further made palatable by the aid of a lump of sugar. The decanting of the ether is, however, a far more serious matter. This spirit is always sent out by the manufacturer in bottles called Winchester quarts, and it would gladden the heart of the toper of to-day if this old-fashioned measure were used in the taverns haunted by him, for each quart is half a gallon. The emptying of these bottles is necessarily a slow operation, and by the time the contents of a sufficient number of them have reached the alcohol, the fumes, in spite of every precaution, have produced all the effect of a heavy bout of drinking on the brain of the operator, and he would find it absolutely impossible to keep his toes on a straight chalk mark. Fortunately for him, however, the effect soon goes off, and after staggering about in the open air for a short time, he is soon himself again.

It will be seen, from the above, that collodion making is by no means a pleasant occupation, and it can easily be imagined, therefore, that the maker is glad to prepare it in considerable batches and let them settle and fine down until they are ready for bottling off. This will explain why, on a never-to-be-forgotten day in 1869, I had a large quantity of collodion in stock, all ready for decanting. It was the last day of November, and the weather had been unusually cold for the time of year. In fact, it had been freezing for several days and there was skating in the fens. The collodion was stored in some splendidly made glass barrels, each one with a capacity of six gallons. They were considered triumphs of glass casting, and came from the German department of the Great Exhibition of 1862. Each barrel had a large glass stopper at the top, and a glass tap in the end. I found these barrels extremely useful for my purpose, for the sediment settled down in the belly, and the clear liquid was easily drawn off by the tap. They had been in use for years and had become well tried old friends. The cold weather was really the cause of the accident, as will shortly be seen. These barrels had been filled on one of the cold days, and they stood,—four of them all of a row, making twenty-four gallons in all—in a room parted off from my studio, which, fortunately for me, was on the ground, and at the bottom of a fairly long garden, and had no fireplace in it. No light was ever taken into it, for well knowing the dangerous character of the materials, all the operations were conducted by daylight.

On the memorable day in question I had been very busy with sitters in the studio, and, in consequence of the great cold, a good fire had been kept up all day. The door leading into the room in which the collodion was stored had been left open, and the heated air had travelled into the storehouse. In filling the barrels I had overlooked the intense cold, and had not allowed a sufficient margin for expansion. The day was waning, the last sitter had gone, and the fire was nearly out, but the studio was still comfortably warm. I had been called up to the house on business, and had been there only a short time when the boy who assisted in printing came rushing in with staring eyes, and exclaimed that one of the barrels had gone crack! I rushed down the garden, and into the studio. There was an overpowering smell of collodion, but there were only a few dull red embers in the grate, and I knew that flame was needed to ignite collodion, so I felt the fear of an explosion was at an end, and peeped through the open door to gauge the amount of mischief done. Part of the end of one of the barrels was out, and a pool of collodion was slowly trailing its way along the floor. The stopper had evidently got fixed, and the heated air had so expanded the collodion in all the other barrels that they were each full up to the stopper. In the ill-fated one something had to yield; the stopper would not, and so the end gave way. It only took a second to see all this, and I rushed to one of the windows, which fortunately opened outwards, and was in the act of pushing it as far open as possible so as to let out the fumes when ——? I cannot find a word to describe the sound. It was not like the sharp crack of near artillery, nor the roar of thunder; it was a hoarse boom, and instantly I was carried out with a force mightier than a gigantic wave of the sea, and deposited on a grass plot some twenty feet from the building. Immediately followed a series of thunder charges of artillery (probably from the explosion of the other barrels), and the sharp rattle of musketry, which was the roof of the studio sent flying skyward, and then descended a hailstorm of finely splintered glass. It was a great mercy for me that they were very fine splinters, for several entered the exposed parts of my body, and I carry to this day several scars as *souvenirs* of that fateful day. I was not quite stunned by my fall, for I was carried—fortunately for me—outward, not upward.

In a second or two I was on my feet, and mechanically put my hands over various parts of my anatomy to see the extent of the damage. I picked out a few pieces of glass sticking variously in my head and hands. The blood I did not heed. With a thankful heart I found I was comparatively whole, and all the rest seemed as nothing against this great fact. The first impression that reached my brain

on regaining my feet was a group near the house, afraid to approach nearer, and distinct among them the maid-servant, with brightly illumined face, distorted by terror. She was frantically wringing her hands, but otherwise seemed paralysed by fear. To see all this was the work of an instant. I was thrown out face foremost, and therefore for a few seconds did not see the extent of the mischief. I had now time to turn round and face the scene—and what a scene! The whole place was a raging furnace. There was no smoke; intensely white flames soared forty feet into the air, and through the openings in the wall, formerly occupied by windows, I could see chairs, tables, cameras, stands, in fact, everything burnable, roaring away, each adding its contribution to the mighty blaze. In a very short space of time there were seven engines on the scene; but, practically, there was nothing to be done. They played upon the charred remains, but everything of value had been totally destroyed long before the firemen could commence action. Of course, the garden was speedily filled by London roughs of the too-well-known type, who seemed to spring out of the bowels of the earth, ready armed for mischief. They proceeded to smash and wreck a glass shed used for printing, and which was in no danger from the fire. Fortunately for me, two or three policemen appeared on the scene, and cut short their ruffianly efforts at wholesale destruction.

A stream of gas from the place where the meter once stood still blazed away, and explained the cause of the catastrophe. I had formerly tried heating the studio by a gas stove, but found it too expensive; I, however, carried a pipe into the dark room, and connected it with a very small home-made gas stove, to keep the nitrate of silver bath warm in winter. I had altogether forgotten this gas arrangement. Out of sight out of mind. I was right in my surmise that the dull-red embers of the expiring fire were harmless, but the inrush of air from the open window drove the etherial fumes from the collodion in the direction of the dark room, and the moment they touched the gas flame away they went to mingle with the ether of the sky, they were free for further action for the weal or woe of mankind. The collodion was no more; but I was left a sadder and a wiser man. Next day I found I had something left from the wreck. There were a number of brass tubes with a semi-transparent treacly substance running out at the ends. A close inspection revealed the name of "Dallmeyer" on most of them. In happier days they had been lenses.

VALENTINE BLANCHARD.

EXPERIMENTS IN COMBINED TONING AND FIXING.

[PHOTOGRAPHIC TIMES.]

OF the one hundred and twenty articles contributed to "The American Annual of Photography for 1892," no one has probably led to so many inquiries for special information and to so extensive discussion as that on the combined toning and fixing bath described on page 87. Of the many statements made as to its efficacy, about thirty per cent. have spoken in terms of high satisfaction, while the rest confessed an inability to procure with it anything like the desired results. But the fact that a few of the many who have worked the bath have had the same results I have enjoyed is something in its favour. To discuss its chemical composition, therefore, would be needless, were it not that the bath has proved not to work equally well under different circumstances.

While conducting the practising class of the Chautauqua School of Photography during the present extremely hot summer, it was found the bath as originally prepared worked with much greater energy, and, whereas during last winter it took from fifteen to twenty minutes to tone and fix thoroughly chloride of silver gelatine paper prints, toning was completed within four or five minutes, evidently too short a time to secure a perfectly fixed proof. To prolong toning, the chloride of silver of the original formula was left out; toning proceeded much slower in the beginning, without, however, rendering the tone as agreeable as with silver, and without the whites being as brilliant and pure as formerly. E. Valenta's formula for a reliable combined toning bath (see the *Photographic Times*, Vol. XXII. page 343) appeared quite *apropos*, and it was concluded to give it a trial. The author's opinion, that when, alongside of the formation of sulphide of silver, gold is also substituted for a portion of the metallic silver of the print, the result is permanent for all practical purposes, appeared reasonable and convincing enough to give the bath a trial. The formula is as follows:—

Water	500 cm.
Hyposulphite of sodium	200 gm.
Sulphocyanide of ammonium	25 gm.
Nitrate of lead	10 gm.
Alum	20 gm.

The bath is diluted with an equal volume of water, and to each 200 cm. added from 7 to 8 cm. of a 1 per cent. solution of chloride of gold. With all that has been said in favour of the bath, it has not worked satisfactorily in my hands. In the first place, there is far too much lead in it. Bradfisch & Pierce's improved chloride of silver gelatine paper of decided acid reaction tones in it to a bluish-grey colour within less than four minutes. After subjecting from fifteen to twenty 5×8 prints to 24 ounces of the bath, it became frothy and thickish, toning proceeded still more rapidly, the gelatine film appeared to be in a state of dissolution, and after the washed print had been squeegeed upon glass, ebonite or tintype plate, it adhered tenaciously and refused to strip off under any circumstances. Reducing the quantity of lead to one-fourth, one-sixth, and one-eighth prolonged the process of toning, but all other effects remained the same. Explanation of a part of the difficulties encountered was found in a recent number of *Photographisches Archiv*, where it is stated that nitrate of lead, and still more so sulpho-cyanide of ammonium, is a powerful solvent of gelatine when at a temperature of 20 deg. C. (68 deg. F.).

Experiments have proved Herr Liesegang's assertions to be perfectly correct, with the exception, perhaps, that with the presence of lead nitrate and sulpho-cyanide of ammonium gelatine dissolves at a still lower temperature than stated.

With these several experiments the practicability and reliability of the Valenta bath had become more than doubtful, and a reconstruction or modification of our old bath was resolved upon. Keeping in view what Valenta had said of toning with lead and simultaneously with gold, and that slow toning only can secure perfect fixing, I compounded a bath that has so far answered all possible demands. The tones produced are agreeably warm, the whites pure, not tinged yellow, fixing appeared to have been perfect, and a reasonable permanency of the print is hoped for.

Dissolve one pound of hypo in 32 ounces of water and 3 ounces of alum in 32 ounces of water. Allow to settle, heat to 120 deg., filter and add 22 grains of nitrate of lead. To 20 ounces of this solution add 5 grains of terchloride of gold dissolved in 2 ounces of water. With 20 ounces of this solution fifty 5×8 Bradfisch & Pierce's emulsion paper, or an equivalent of larger or smaller dimensions, can be toned and fixed to perfection. After toning this number of prints the gold is exhausted, and the bath should not be used any longer. A well-printed-out picture tones in from twelve to fifteen minutes, sufficiently long to secure a thoroughly fixed print. When the tone of the picture begins to look purplish by transmitted light, no matter how the colour may be in reflected, remove it at once to *running* water and continue to wash for about one hour, when the print may be dried or squeegeed. There is alum enough in the solution to harden the film without resorting to an extra tanner, and carbonate of sodium before or after toning and fixing is not at all necessary. The finished prints have a beautiful deep purple colour and the whites are perfectly pure.

The many inquiries made about toning and fixing gelatine prints in a combined bath, the repeated reports on total failures, and the very miserable prints sent for inspection from many sources have induced me to write down these my latest experiences, for the readers of the *Photographic Times*. There is only one question to be decided, Are gelatine prints toned in a combined bath reasonably permanent? An argument in favour of an affirmative answer to the question is an exhibit of albumen prints displayed at the Chautauqua School-rooms. They were toned and fixed in a combined bath similar to the one above described as early as in the summer of 1852, and after a lapse of forty years have preserved a generally good tone, with the whites but slightly tinged.

CHARLES EHRMANN.

STEREOSCOPIC PHOTOGRAPHY.

[Birmingham Photographic Society.]

IT is with a feeling of diffidence that I address myself to this subject this evening. In the first place, the last time it was discussed before the Society I found myself totally opposed to it, and it is a somewhat anomalous position to place one's self in to be found advocating at a meeting of this sort the very thing one had opposed previously. In the next place, there are gentlemen in the room who know far more about the subject than I do, and who are better qualified to speak upon it than I am. The difficulty the Council had, however, when I was selected to read the paper was this, that no matter how diffident I might be, they were still more so, and that must be my apology for any shortcomings which may appear in my treatment of the subject.

STEREOSCOPIC PHOTOGRAPHY NOT DEAD.

Some of our members have obtained a great deal of amusement out of this subject by chaffing those who advocate its popularity. One gentle-

man, for instance, avers that it is as dead as Queen Anne. He, however, is careful not to say to which Queen Anne he alludes, because it is very evident that stereoscopic photography is not dead. On the contrary, its claims are being urged more every season, and I venture to predict that it will yet become the most popular form of amateur photography. Another joke made at its expense is that in instantaneous pictures made by its aid moving figures are so tantalising, that a man in the act of walking presents such a realistic appearance, that one feels a desire to drop a penny in the slot to make him move, or even to take more drastic measures still. Well, gentlemen, I claim that that is an additional charm to the stereoscopic worker, viz., to depict Nature as it really is, or, shall I say, as we really see it. I hope to prove to you before I finish my paper that it is impossible to see an ordinary photograph adequately represent any subject. A friend who is present remarked a short time ago in the club room that we got our results by means of a trick, and that it was not a genuine representation. Well, it is for me to prove that it is not a trick, but the most correct and the only truthful way of delineating a view or picture upon a plane surface. If you wish to produce in a natural manner several planes, there is, so far as I know, no other way of obtaining the result than by stereoscopic photography. If I hold a book in my hand at arm's length edgwise, and close one eye, I see the edge of the book only; but if I open the other eye, still holding the book in the same position, I see not only the edge, but also a portion of the side of the book, which proves that with two eyes two distinct pictures are formed which, however, coalesce either by a mental act, which is the most likely theory, or from some connexion between the nerves of the retinæ which at present has not been discovered. Many theories exist, but as they all differ, it is no part of my duty to trouble you by discussing them.

Binocular Vision.

It seems to be upon the whole considered most probable that the power of forming a single idea of an object from a double impression conveyed by it to the eyes is the result of a mental act. If you hold up one of your index fingers close to the eye, and one farther off, you will see that by looking at the one farthest away with both eyes, you really see three fingers. In the same way, by looking at the nearest one, you still can see three fingers, *i.e.*, by bringing the optic axes to bear upon the near finger, the one farthest away is brought to a different part of the retina in each eye, and two fingers are seen behind the one which is really in focus. These experiments might be repeated in numerous ways; but I think I have established the fact, that binocular vision produces two different impressions, which by a mental operation give rise to only one sensation. Now, if we look with both eyes at an ordinary photograph, *i.e.*, taken with one lens, it is evident something must be wanting to adequately represent the subject to us, and all will agree that there is in every photograph, so taken, an appearance of flatness which can only be overcome by aerial perspective, and so when the distance is almost obliterated by atmosphere, and just a dim sensation of the mountains, or trees, or whatever may be at the background of the picture presents itself, it is seized upon as a triumph of photographic art; often by the very men who have done all they can by the use of isochromatic plates, and yellow screens to overcome what they know perfectly well is not a representation of Nature in its best aspect; but which is the best result they can accomplish. The fact, also, that to look at the photograph with one eye only, and then preferably either through a tube or shaded by the hand, will give a partially stereoscopic effect, all goes to prove that for either the most correct representation, or to afford the greatest pleasure to our friends or ourselves, the use of the stereoscope is not only not a trick, but the only legitimate way of showing or looking at our pictures when done.

Why the Stereoscope went out of Fashion.

You may ask if, then, all you say is true, how is it the instrument is gone so much out of fashion; or, as I put it in commencing, "been asleep?" That is easily answered. There is no doubt that great care is necessary in mounting the pictures, which, to an amateur, is only increasing his pleasure in the work, and an incentive to excel; but which to the tradesman, who gets the work done in the cheapest manner possible, and which he accomplishes by employing, probably, young persons, who think but little, and care still less, as to how the slides will look when placed in position, it is not fair to the art to judge of it by its past history. For years I could never look with any pleasure through a stereoscope, because, in order to make the pictures overlap or combine, I had to strain my eyes almost out of my head, and the consequence was that, after looking at about half a dozen views, I had such a headache that I was compelled to give up looking at any more. A few months ago an American called upon me with a new form of stereoscope, and I found that it was a wonderful improvement on any I had seen before, but still there was a slight strain, and I found at last that it occurred more with some pictures than others, and, in fact, with some there was no strain at all, and upon measuring the distances they were mounted apart, I soon found out the reason. More strain was occasioned by those mounted three inches apart, and some were even over this, which made it worse. I found that those at two and three-quarters of an inch were quite normal and easy to look at. I believe that two and a half inches is better for many people, but as I can see two and three-quarter inch views quite easily, I prefer that width, as, of course, I can get, by means of the quarter inch, a larger picture and more subject.

The Optics of the Stereoscope.

Perhaps at this stage it would be well for me to illustrate by a diagram what the action of the lenses in the stereoscope is. I should say that the form of instrument as now used was invented by Professor Brewster. A double convex lens is divided across the middle, and the two helves are set with their thin edges in juxtaposition. In the *Stereoscopic Manual* by Chadwick, which is very interesting and useful to all workers in this branch, he points out that it is possible to construct a stereoscope without lenses at all. He says, in considering the size of the pictures and the dimensions of the box, "When we look at a tree in Nature a mile away, we view it with so little convergence of the optic axes as to be termed practically parallel vision; and as it is by greater or less convergence that we judge distance, we must view the photograph of the tree with practically parallel vision, for it must be remembered that, if we observed the tree with a greater convergence of the optic axes, we should not estimate it at its true distance, but at a nearer distance; and as our eyes are only two and a half inches apart, it is clear that the image of the tree in the two photographs must not be more than two and a half inches apart. This dimension, then, settles the size of the photographs at not more than two and a half inches in width. With normal vision, we cannot conveniently observe anything distinctly at a nearer distance from the eye than eight inches, and the box must be at least eight inches long in order to accomplish this." It was pointed out the last time the subject was discussed in this room, I think, by Mr. Griffiths, that even this simple form of stereoscope was unnecessary, and that with practice it was possible to get the effect by holding the pictures in the hand and by diverging the eyes until parallel vision was obtained. This I tried at for a long time, and at last succeeded in getting the effect; but I thought there was too much strain upon the eyes, and no doubt there was, and for this reason. If we wish to obtain the best result from a photograph, as to the natural size and perspective, whether large or small, we should view it at a distance from the eye equal to the focus of the lens we have used in taking the view, and it is for that reason that most people prefer whole-plate size, as the lens usually employed is about ten inches focus, which may be considered the normal focus of the eye. Now, as it is necessary to use a lens of about five inches focus for stereoscopic work in order to get in the usual angle of view, and by that I mean about the same amount of subject as that obtained with an ordinary quarter, half, or whole-plate lens, it becomes necessary to get the assistance of a lens in order to procure the correct proportion, because it is evident that, if the picture is produced by a five-inch focus lens, and we observe the print at ten inches from the eye, it would appear only one-half its true diameter.

So far as I can see, the object in placing the lenses in this position is to give parallel vision, as well as to magnify the print to its proper size. You will see by the diagram which I have prepared that the ray of light is caused to slightly diverge, and thus place the optic axes in the same position as when looking at the view itself. For this reason the lenses should be mounted not more than two and a half inches apart from centre to centre, as the normal distance between our eyes is approximately two and a half inches, and, consequently, if the lenses are farther apart, as is the case with many stereoscopes, only the thin edges of the glasses are used, and the diverging lines are proportionately more acute, and consequently the true distance is not appreciated, and objects in the picture convey the impression of something much smaller than is really the case. While this objection may also be urged, I think that the more the lenses converge, or, as they are used in the stereoscope, diverge, the greater the strain will be upon the eyes. We may now leave the theoretical for the more practical part of the subject, and I would first call your attention to the convenience of this work over ordinary photography.

Sizes in Stereoscopic Work.

Most of you will, I think, agree with me that quarter-plate work is too small for any purpose except lantern-slide making, snap shots in the hand camera, or carte de visite portraits. Half-plate work is very little better. The views are too small to frame for pictures, and too large to mount in a scrap album, and in consequence the majority of the prints

are left to tumble about until they are spoilt. With whole plate work it is different. You may with this size view decorate your walls with pictures worth looking at, but at what a cost! Plates, paper, chemicals, mounts, and frames, besides the hard labour entailed; and then, after carrying the apparatus five or six miles, finding nothing worth exposing upon! That is one of the pleasures of whole-plate work. Now take the stereoscopic camera. You can use a small and lightly-made camera, a light stand. You can use only one lens if desired, and take a quarter-plate picture for a lantern slide, or if you wish to get a half-plate picture you have only to adapt one lens and remove the dividing screen, and you have with your five inch lens a wide angle picture, or you can carry a seven and a half inch lens, and place in your camera front for an ordinary view. But why take all that trouble? Suppose you see a nice bit, and you want to get a lantern slide, or quarter-plate size for a pocket album, or a stereoscopic view for the drawing-room table, you have it all at once in the one negative; but I can carry you still further. Suppose you think you would like a half-plate picture framed for the breakfast-room or nursery walls, or a whole plate or 12 × 10 for the drawing-room, all you have to do is to enlarge the subject on bromide paper, and you have it.

Now, I ask you, can any other camera give you all these advantages, and I am sure you will agree that it is impossible to get the same results in any other way. There is nothing for you to relearn or to forget before you can produce satisfactory stereoscopic slides. The negatives require a full exposure to prevent chalkiness and in mounting the slides you have to transpose the pictures from left to right, in order that, when looking at the view, you may place the right-hand side picture as taken before the right eye, which it will easily be seen would not be the case unless transposed, from the fact of the pictures being taken inverted. As I mentioned before, I take some object at the middle distance, and measure 2¾ in. from centre to centre, carefully cut the two pictures top and bottom before dividing them, and with ordinary care in mounting, a perfect result is obtained. I place a straight line across the mount as a guide, both for the centre and also to keep the prints upright. I have not thought it necessary to demonstrate at any length before you, because, as I said before, there are no new dodges to learn in order to assist you to success. I hope I have succeeded in removing any prejudices which may have existed in your minds against the subject under discussion, and also in setting forth a few of the pleasures which we who follow it enjoy, I have only to say in conclusion that I do not think any one who has followed it has ever grown tired and given it up entirely, while I think all will agree that a stereoscopic picture properly taken, mounted, and viewed, is indeed a thing of beauty and a joy for ever.

GEO. A. THOMASON.

FOCUSSING AND THE USE OF DIAPHRAGMS.

[Canadian Photographic Journal.]

IN cross-heading this article I have followed the order adopted by the publishers in their invitation to competitors; but, as correct focussing depends to a large extent on the proper use of diaphragms or stops, I shall reverse the order and deal with them first.

The photographic lenses in general use are of two classes, single and compound, and with both stops are employed, although for very different purposes; in the first they are absolutely necessary, while in the second they are only used as a means of improvement.

A single lens, often spoken of as a landscape lens, whether plano-convex or meniscus, cannot be corrected for spherical aberration, the rays from toward the margin coming to a focus nearer the lens than those from towards the centre. The only remedy for this, unless the image were to be received on a concave plate, is the placing of a stop at some distance in front of the lens, so as to cut off the objectionable marginal rays, and let the picture be formed only of such central pencils as come practically to a focus on one plane.

In the case of a compound lens, spherical aberration has to a large extent been eliminated, so that with a full working aperture, as fixed by the maker, it will, if of a good quality, produce a sharp image, but a sharp image of only such objects as are on one plane; an object at, say, twelve feet being perfectly sharp, while those at ten and fourteen are out of focus. This applies most particularly to portrait lenses, but in a less degree to most compound varieties, is generally spoken of as want of depth of focus, and remedied more or less in proportion to the size of the stop employed. This will be easily understood from a consideration of the fact that the rays from the upper and lower margins of, say, a lens of three inches diameter, cross or come to a focus at, say, a distance of eight inches, at a much wider angle than those from the upper and lower edges of, say, a half-inch stop, something, in fact, like as twenty to three. To secure a sharp image of the rays crossing at a wider angle, the focussing screen must be placed exactly at the crossing point, while on those at the much smaller angle it may be moved for a certain distance to and fro without visibly affecting the sharpness. In other words, objects both in front and behind that which had been specially focussed appear sufficiently sharp, and thus "depth of focus" is obtained.

Although the securing of depth of focus be the main object of the stop in a compound lens, it also tends to flatten the field. Except in the case of the new "Anastigmat," it has been hitherto impossible to altogether eliminate spherical aberration from even the best type of compound lens, and although the depth of focus is not needed there, the small stop is absolutely essential to secure perfect marginal definition.

Of course, it goes without saying that the smaller the stop the less will be the light that is transmitted to the plate, and consequently the longer will be the exposure; but the amateur, and the professional also, as he is not infrequently in blissful ignorance of the nature and properties of his lens, should remember that the size of the stop *per se* has no meaning, and only becomes intelligible when its relation to the focal length of the lens is known.

Stops, therefore, should always be thought of and spoken of in that relation, viz., as *f*-x, x being the proportion the aperture bears to the focus of the lens. Until a few years ago each maker made the apparatus of his stops according to his own fancy, although there was a kind of understanding that each smaller stop required twice the exposure of its next largest neighbour, but modern opticians generally adopt what is known as the U.S., or universal system.

The largest working aperture of the average portrait lens is one-fourth of its focal length, and the stop, consequently, is marked *f*-4. The U.S. takes that as the unit, and also marks it No. 1. A little calculation shows that if the aperture be reduced to 1½-fifths of the focal length, it will admit just half the light admitted by the one-fourth, and it is marked *f*-5·6, with the U. S. No. 2, and so on through as many stops as can possibly be required. Thus:—*f*-8, No. 4; *f*-11·3, No. 8; *f*-16, No. 16; *f*-22·6, No. 32; *f*-32, No. 64; *f*-45·2, No. 128.

In this way not only is the relation which each stop bears to the focal length of the lens shown, but also the exposure required with any one stop on any particular plate being known, the time of any of the others is seen at a glance. For example, if it is known that *f*-22 needs two seconds, *f*-32 will need four, and *f*-16 only one; or if *f*-4 requires one second, then the U.S. numbers behind each stop give the respective number of seconds needed.

Amateurs whose lenses are not so marked could hardly take the trouble to alter the openings of their stops, but they should certainly ascertain the *f* value of each of them, so as to be able to communicate intelligibly with their brethren. The first step is, of course, to ascertain the equivalent focus of the lens. If a single one, all that is required is to focus carefully some distant object, and measure the distance between the back of the lens and the focussing screen. With a compound lens the operation is more complicated. There are various methods by which it can be accurately accomplished, some of which may be printed in the future; but, in the meantime, it may be managed with sufficient accuracy in a simple way. Focus, as in the case of a single lens, on a distant object, and measure the distance between the diaphragm slot and the focussing screen, which generally will be near enough for most practical purposes. Suppose the focus is found to be ten inches; bring that to tenths=100, and ascertain the number of tenths in each of the stops. Suppose one should be four-tenths; divide the 100 by 4, which will give 25, and shows that stop should be marked *f*-25, and so on with all the rest. A smaller fraction than a tenth, a sixteenth, or, better still, a millimeter, for the reduction of the focus and measurement of the stop, will admit of more refined measurements, but tenths will do very well.

Having thus laid the foundation, as focussing and the proper use of the stops go hand in hand, I now proceed to that important operation.

The first essential is a very fine ground glass. If the camera has not that it may be improved by oiling, or, better still, by rubbing in a solution of wax in turpentine, and rubbing off as much as possible. For very fine work a good plan is to cement with Canada balsam a microscopic glass cover in the centre of the focussing screen, and employ a focussing glass or Ramsden's eyepiece adjusted so that its focus falls exactly on the front of the focussing screen.

If the object in view be such as the copying of a map, whose sharpness to the edge is a *sine quâ non*, the adjustments as to size, positions, &c., may be made with full aperture or a large stop, and then stops smaller and smaller must be put in, and the image examined until the desired result is obtained.

For portraiture, sharpness all over the plate is not necessary, and sharp backgrounds not desirable. Therefore, *f*-4 or *f*-8 should be used,

and in the case of sitting figures, where the projecting knees may be out of focus when the head is in, the swing back should be employed as a means of correction.

It is in landscape work, however, that focussing assumes almost the dignity of a science, and in which, from an art point of view, the use or abuse of the stop may make or mar a picture. Those whose only aim is to produce what are sometimes called topographical landscapes have only simple duties to perform—to ascertain the point from which the most pleasing composition can be obtained, focus sharply any prominent object, slip in stop *f*-32 or smaller, and give the necessary exposure. But pictures, or, rather, photographs, so produced are destitute of that which gives the greatest charm to a landscape—atmosphere; and as the various distances are all almost equally sharp, the unsatisfied eye wanders, like Noah's dove, from point to point without finding a place on which to rest.

The picture-maker, or true photographic artist, has a different end in view. He wants to make a picture in which the eye shall be led to that which is its *motif* and made to rest there, corraled in from wandering, as it were, by the less sharply defined subordinate parts, while a kind of halo of mystery is suggested by the almost imperceptible atmospheric haze, rather felt than seen in the distance. He, too, like his topographical friend, places his camera on the well-studied point of view, and knowing that the effect of a picture, when confined within the limits of the focussing screen, is often very different from that produced by looking at it in the open, carefully examines it with a large stop, or full aperture. Composition and light and shade satisfactory, and the *motif* clearly defined in his mind, the general effect is carefully studied, and, until he becomes indeed an experienced hand, tried with stops of various sizes, and even by putting the principal points of the *motif* itself more or less out of focus. Far be it from me to recommend the principles of the "fuzzy school," but there *are* subjects that are improved by the removal of razor-edged sharpness.

Working on these lines, the photographic artist will find that the great majority of subjects will be most successfully and artistically photographed with stops varying from *f*-16 to *f*-22, and I may add that I have exhibited pictures that were both admired and medalled, and that the only stop I carry is three inches of hard rubber having at one end an aperture *f*-16, and one *f*-22 at the other.

JOHN CLARK.

FURTHER EXTRACTS FROM THE DAILY AND WEEKLY PRESS ON THE PHOTOGRAPHIC EXHIBITION.

[*Morning Post.*]

Much that is very interesting may be seen at the annual Exhibition of this Society. It comprises a large number of photographic pictures, whose size ranges from the modest "quarter-plate" to such dimensions as seven feet by five feet. They are marked by great diversity of subject, and the different materials and methods by which the prints have been obtained from the negatives add to their variety of effect. Several sets of lantern slides are also on view, together with many cameras of new patterns, some "chromoscopes" for facilitating the inspection of glass transparencies, lenses and tripods, and other paraphernalia appertaining to the profession. *The Story of a Cloud*—a series of five carbon prints—is the result of an ingenious experiment by Mr. Birt Acres, whereby he has secured the changes in the form of a bank of cumulus clouds, from the time when it appeared above the horizon, comparatively insignificant, through its brief epochs of growth, to the moment when its acquired volume is about to drift away again into "thin air." Mr. Acres also exhibits another excellent sky-photograph, as well as some small hand-camera studies at Barnet Fair, more commonplace in character, but very good indeed of their kind. It is not often that dramatic incidents occur when the necessary apparatus is at hand for their record; and Mr. H. J. Godbold is therefore to be congratulated on having obtained such a such a subject as is presented in *A Rocket to the Rescue*, wherein is depicted the timely assistance often rendered by coastguardmen's life-saving gear to the crews of distressed vessels. The figures on the beach are over dark and blurred in detail; but this was, doubtless, owing to no inefficiency on Mr. Godbold's part, but rather to the dull light which evidently prevailed, and to the necessity for a very quick exposure, since the rocket, with its attached line, is visible in mid-air, flying swiftly over the foaming surge to the stranded ship, which lies with its broadside at the mercy of the waves. A wild sea is pictured in the great photograph seven feet long by Messrs. Elliott & Son, which is a carbon enlargement from a whole-plate negative by Mr. Birt Acres. Another excellent work of a similar kind is *Harvesting*, by the Woodbury Company. It is not equal in size to that of Messrs. Elliot, but its length must measure something between four and five feet, and it portrays in a very successful manner a cornfield with a number of labourers busily engaged. *The Rehearsal*, by Mr. Adam Diston, is a humorously arranged composition of two figures, one a man practising upon a huge trumpet, whose portentous magnitude amply warrants the player's gravity of expression; the other his better half, a dame in somewhat eccentric attire, who closes her eyes, perhaps in ecstatic appreciation, or haply slumbers so soundly that she is fortunately spared an infliction "most tolerable and not to be endured." In this and in Mr. Diston's *Highland Smugglers* the grouping is good and the surroundings are appropriate and well arranged. Mr. R. H. Lord's "*How is that?*" wherein a village worthy tests his crony's snuff, is a capital study of rustic character. Mr. J. A. Dumont and Mr. A. G. Tagliaferro contribute some amusing photographs in the same vein, but these essays at picture-making are not uniformly successful. *Cleopatra*, by the Rev. J. A. Rivington, for instance, is good as a photograph, being well manipulated, but, although the accessories are Egyptian in point of decoration, they have a cheap, artificial appearance, and his sitter, although she is dressed appropriately enough, has neither the form nor the features which one connects with the "Serpent of Old Nile." And though the delicacy of the tones of the elastic white drapery worn by the young lady in Mr. J. B. Scott's *An Old Garden* commands admiration, its folds might have been more tastefully arranged. The background, too, on which the title is founded, consists too obviously of a painted screen, displaying a very conventional wall and balustrade. Mr. W. J. Byrne has achieved a well-won reputation for his likenesses of children, and those which he now exhibits are worthy examples of his judgment and skill. Some admirable portraits are sent by Mr. H. H. Cameron, Mr. F. Hollyer, and Messrs. Mowll and Morrison; and there are numerous beautiful landscape studies. Mr. Karl Greger's series of six pastorals, where sheep graze in the meadows or are driven homewards; Mr. B. Gay Wilkinson's *Westminster*, *The Peaceful Evening Hour*, and *The Estuary of the Blyth*; Colonel J. Gale's *Towards Sundown* and *The Incoming Tide*, and Mrs. Main's *Frost and Sunshine*, a set of six varied effects of sunlight on snow, have deservedly obtained the Society's medals; while many more of these transcripts from Nature are equally charming. *In the Pool*, a view of the river and shipping towards evening, by Mr. L. C. Bennett, is especially worthy of mention. Among the best things in the Galleries should also be classed Mr. E. D. Stern's *Scenes in North Africa* and Mr. A. D. Halford's Italian views. Some excellent reproductions of attractive pictures are exhibited by Messrs. Boussod, Valadon & Co., Mr. J. Harold Roller, Mr. H. H. Cameron, and the Woodbury and Autotype Companies. The Exhibition will remain open until November 10, and on three evenings of the week—Mondays, Wednesdays, and Saturdays—it is proposed to have displays with the optical lantern.

[*Globe.*]

In consequence of recent dissensions, into which it is unnecessary to enter, as they are now happily over, some familiar names are missing from the list of exhibitors at the annual exhibition of the Photographic Society. The new management has, however, been well supported, and the exhibition will be found to have many interesting features. The greatest change that has taken place has been the increase of the number of medals to seventeen, in place of the varying number of five to ten which has hitherto ruled. The increase in the number is not to be deprecated, and no fault is to be found with the manner in which they have been bestowed—a point upon which the members of the new Council are especially to be congratulated. In each case the medalled exhibit has special merit, and the medals cover the various sections into which the art is now divided, without any undue bias being displayed towards the prevailing craze among a few, such as in former years has given offence to the general body of the exhibitors. Without attempting to deal with the successful pictures in their order of merit—if they could be held to have any—it may be remarked with pleasure that Mr. Gale, the Meissonier among photographers, occupies a distinguished position; for, though he still prefers to work on a small scale, his pictures are always seen with pleasure and profit, being models of excellence in point of choice of subject, technical skill, and artistic merit. The place of honour is held by an enlargement in carbon, by Messrs. Elliott & Son, of a sea-piece, which is an admirable advertisement for that well-known firm. Then we have medals for prints on rough drawing paper, deservedly given for a series of prints by Mr. B. Gay Wilkinson and Mr. W. Bedford. Another medal is given to Mr. F. Boissonnas for a view of Mont Blanc, taken with one of Dallmeyer's new tele-photographic lenses, which illustrates the latest discovery in photography and points to the great value of Dallmeyer's discovery. In this connexion, too, may be mentioned the medal given to Messrs. Taylor, Taylor, & Hobson, of Leicester. It will be remembered that some time ago the Society took up the vexed question of interchangeable flanges, with a view to remedying a difficulty specially felt by the possessors of a limited number of lenses. The outcome of the discussion of the question was the arrangement of a number of standard flanges; and Messrs. Taylor, Taylor, & Hobson, having adopted the Society's standard, are exhibiting the series, and are rewarded by a medal, which has the additional value of being the only one given for apparatus. Had the judges had another at their disposal, they would doubtless have given it to Beck's new hand camera—the "Frena"—in which the difficulty of the magazine is solved in a very simple and satisfactory manner; likely to create quite a revolution in the "press-the-button" system. There is nothing in the exhibition at all relating to colour-photography—no one is likely to have expected that there would be—but, whether in the matter of amateur or professional work, much will be found to interest and amuse. During the continuance of the Exhibition, there will be the usual lantern nights.

[*Lloyd's.*]

The annual Exhibition of the Photographic Society, Pall Mall East, had preliminary inspection yesterday. An average of excellence ahead of previous collections owes itself in no small degree to a more rigorous standard of selection, necessitating the rejection of a large number of works forwarded. A striking feature is the abandonment of the mere mechanical processes of old, and the importation of a genuine artistic spirit, which can assert itself as potently with a camera as in the art of the engraver and painter. As might be expected, the medallists exhibit some fine work. The work assigned the post of honour, the Tennysonian illustration, *Break, break, break, at the foot of thy crags, O Sea!*—a carbon enlargement from a whole-plate negative by Birt Acres, contributed by Elliott & Son—is a singularly powerful work, the wave breaking near the foreground having peculiar energy of expression, while the light on the horizon suffuses the tremulous sea with singular beauty. Most noticeable is Mr. Henry Stevens's *Meadow Sweet*, for the softness of its tone; and Mr. Yeo's *Blowing Bubbles*, a child's dream of joy ending in disappointment, has very happy treatment, as likewise Mr. J. E. Austin's *Worn Out*, a workman inspecting a clock, and *To Account Rendered*, respectively full of dramatic pose and life. Amongst other medallists are Karl Greger, B. Gay Wilkinson, W. Bedford, J. Gale, A. R. Dresser, F. Muller, J. Harold Roller, W. M. Warneuke, and Mrs. Main. There is a portrait of Professor Herkomer, sent by Gabell's, full of vitality and character, and their *Head of a Boy* has been manipulated with great artistic feeling. One of the interesting examples is the *Story of a Cloud*, five phases of the phenomenon, thirty seconds only intervening between each—an attestation of Mr. Birt Acres' dexterity and close observation. Another contribution fascinating to the scientist will be found in the eighteen photo-micrographs of pure cultivation of bacteria from sewage, by Sir H. E. Roscoe and Mr. Joseph Lunt. Portraiture is well illustrated in Mr. Fred. Hollyer's presentments of Mr. J. M. Barrie, Mr. W. B. Richmond, and Mr. Walter Crane.

[*The People.*]

A New Photographic Terror.—Soirée in Pall Mall.—The *soirée* of the Photographic Society was of unusual interest. The elements of disturbance, which have made things unpleasant for the last year or two, have been got rid of, and, under new management, the Society may be said to have embarked on a fresh career of prosperity. As though to inaugurate the new departure, there was a large attendance, Captain Abney, the President, receiving the guests, in company with Mrs. Abney, other well-known members of the Society doing the honours of the evening. One of the principal items on the programme was, of course, to inspect the show of photographs. This year these are of a very attractive character, the offer of seventeen medals, instead of about half the number, as in previous years, having drawn an excellent collection of photographs. One of the principal exhibits, in point of novelty and interest, was a print of Mont Blanc photographed at a distance of fifty-six miles. This is the first photograph of the kind ever exhibited, and is quite a curiosity. Mr. Dallmeyer, the lens maker, has succeeded, after many failures, in making a photographic lens which screws on to the eyepiece of an ordinary telescope, and enables a photograph to be taken of whatever can be seen by aid of the telescope, with the same finish and detail as though taken in an ordinary camera. The new discovery, thus placed before the public for the first time, opens up new realms of possibilities for the amateur photographer. The detective camera has already played havoc among the proprieties; but the possibilities of the detective camera are as nothing compared with the photographic telescope, inasmuch as the owner of the detective camera could always be seen, whereas the photo-telescopist may be miles away, or, at any rate, concealed at a distance. Seaside "spoonies" and bathing ladies will have to be mindful of probable pictures taken from the houses on the front.

[*Graphic.*]

The Exhibition of the Photographic Society of Great Britain, now on view at the Gallery in Pall Mall East, is quite as comprehensive and interesting as any of its predecessors. It does not appear that any scientific discovery likely to lead to fresh developments of the art has been made during the last year; but most of the works show complete mastery of the methods employed in their production, and a fair proportion bear evidence of artistic taste in selection of subject and arrangement. Landscapes, as usual, form the largest and most satisfactory portion of the display. A series of eight wooded river scenes by Mr. W. Bedford, together with fulness of tone and delicacy of detail, have pictorial beauty of composition, a point of view from which the materials of the subject harmoniously combine having been in each case chosen. The same distinguishing merits are to be seen in Colonel J. Gale's luminous little study, *The Incoming Tide;* in Mr. B. Gay Wilkinson's *The Silver Strand*, and in Mr. W. Wainwright's spacious views of *The Matterhorn* and *Zermatt Valley*. There are some capital examples of instantaneous photography, particularly a well-defined group of flying pigeons, by Mr. F. Blake, and five photographs showing the changes of form of a bank of cumulus cloud in less than half a minute, by Mr. Birt Acres. In a sea-coast view, seven feet long, enlarged from a negative of Mr. Acres, by Messrs. Elliott & Son, the momentary aspect of the breaking waves and moving sky is recorded with convincing fidelity, but the unrelieved blackness of the shadowed rocks in the foreground detracts something from its value. Among the most artistic things in the collection are a series of portraits of well-known men, by Mr. F. Hollyer. The half-lengths of Mr. Burne Jones, Mr. Andrew Lang, and Mr. G. F. Watts are especially good works, they are all naturally posed, and admirably fulfil the requirements of pictorial art as regards balance of light and shade, and harmony of line. Other good examples of photographic portraiture are Mr. F. Downer's gracefully composed group of *Lady Mary Lloyd and Child;* a characteristic half-length of *Professor Herkomer*, by Gabell & Co., and several lifelike heads of children by Mr. H. Yeo. Good reproductions of many well-known pictures are contributed by the Woodbury Company, the Autotype Company, Mr. H. H. Cameron, and MM. Boussod & Valadon; and the valuable service that photography can render to science is shown in several anatomical studies by Mr. T. Chartera-White, and in a series of eighteen photo-micrographs of *Bacteria from Sewage*, by Sir H. E. Roscoe, F.R.S., and Mr. Joseph Lunt.

Our Editorial Table.

Die Photographische Camera und die Momentapparate.

By Dr. J. M. Eder. Halle a. S.: Wilhelm Knapp.

This, the second volume of the *Ausführliches Handbuch der Photographie* treats in detail of probably every known variety of shutter, camera, stand, used in time and instantaneous photography, apparatus for photogrammetry, solar and other kinds of enlarging, telephotography, &c. Its descriptions are full and exhaustive, and, it need hardly be said, are marked by accuracy and clearness. The volume, which consists of over 400 pages, has nearly 700 explanatory illustrations, which alone constitute a feature of great value in a work of this kind.

Brun's Colours.

Messrs. Schwarz & Co., Dashwood House, E.C., have submitted a box of Brun's glossy transparent colours, which we have tried on photographs both on paper and glass, this latter embracing opals and lantern transparencies. These colours are semi-fluid or viscous, and are transparent; therefore they lend themselves admirably to their application to photographs, which they colour without destroying the details, thus ensuring in the case of portraits the preservation of the likeness and drawing. They are easily applied, dry quickly, and may be applied a second and third time to any part needing strengthening up. They are put in small bottles, each bearing its appropriate label, and in boxes containing twelve and twenty-four colours respectively. In the hands of any person of taste very pretty effects can easily be obtained with them.

"Imperial" Opal Plates and Lantern Plates.

The Imperial Dry Plate Company, Limited, Cricklewood, are now issuing opal bromide plates for development by ferrous oxalate and cognate developers. Having tried them, we find that they are highly sensitive, develop clearly, and give good tones. The material is pot opal, finely ground on one side.

We developed some of the lantern plates with iron, amidol, pyrogallol, and hydroquinone respectively, and found them give good results with each of them. The tones, of course, differed with all these.

Under the designation of the *Practical Photographers' Label Book*, Messrs. Percy Lund & Co. have issued a nice and comprehensive collection of useful labels alphabetically arranged, gummed, and perforated. They embrace the names of everything required in photography.

RECENT PATENTS.

APPLICATION FOR PATENT.

No. 17,175.—"Improvements in the Methods of Regulating the Flow of Liquids over Photographic Plates." G. V. Forbery.—*Dated September 27, 1892.*

SPECIFICATIONS PUBLISHED.

1892.

No. 5132.—"Hand Camera." Smith, A. C. & A. A.
No. 5597.—"Coloured Photographs." McDonough.
No. 10,023.—"Photograph Developing Tray." Desboutin.

PATENTS COMPLETED.

The Preparation and Employment of Aromatic Amido Compounds as Developing Means in Photography.

No. 15,434. Julius Hauff, Feuerbach, near Stuttgart, Germany. *September* 3, 1892.

The amido phenols, such as p-amido phenol and the two p-amido-cresols, which have been so highly praised of late as developing means for photographic purposes, have the defect that they are so slightly soluble as to necessitate for their use a recourse to caustic alkalies, which are in many ways unsuitable in the practice of photography.

The use of caustic alkalies is likewise needed for the development of the photographic image with p-phenylene-diamines, the use of which is protected by German Letters Patent, No. 46,915, dated August 1, 1888, but has now been freely given up, as great inconvenience resulted from the use of caustic alkalies.

I have remedied these defects by alkalising the amido group, through which I obtain in the p-amidophenol such a solubility as will allow the exclusive use of carbonates of the alkalies, while in the phenylene-diamine I not only obtain a greater solubility, but increase the developing power in such a manner as to allow of the use of carbonates of the alkalies.

For the development of photographic images the following compounds are used :—

I. Alkalised amidophenols of the composition $\begin{matrix}-OH \\ -NR_1R_2\end{matrix}$ amongst which are the mono- and di-methyl-(ethyl-) derivatives of

1. p-amidophenol,
2. o-amido-m-cresol,
3. m-amido-o-cresol,
4. m-amido-(v-)m-xylenol,
5. m-amido-p-xylenol,
6. o-amido-(v-)o-xylenol,
7. o-amido-(s-)m-xylenol.

The alkalised amido-phenols have a solubility of 3 per 100 and, have moreover, as compared with the ordinary amido-phenols, much more energetic properties.

The following solutions are prepared as being most suitable,

Solution A.

Metol (methyl-p-amido-m-cresol	1 gramme.
Sulphite of soda	10 grammes.
Water	100 ,,

Solution B.

Potash	10 grammes.
Water	100 ,,

For use, two or three parts of the solution A are mixed with one part of the solution B.

It is obvious that soda, as well as sulphite of potash, may be likewise used. The following is the best concentrated developing agent ready for use.

Metol	2·5 grammes.
Sulphite of soda	25 ,,
Potash	12·5 ,,
Water	100 ,,

For use it is diluted to from five to eight times its volume.

II. Alkalised diamines. Mono-, di-, and tetramethyl- (ethyl-) derivatives of

1. p-phenylene diamine,
2. p-toluylenediamine,
3. p-xylylenediamine,
4. α-β-napthylene diamine,
5. α-α-napthylenediamine.

The alkalised phenylenediamines are distinguishable by their extraordinary solubility, and have the property of developing the photographic image with carbonates of the alkalies. The durability of the solutions is very great.

For developing purposes the following mixture is used :—

1 gramme dimethylphenylenediamine,
5 grammes sulphite of soda,
5 grammes potash,
100 grammes water.

It is a phenomenon worthy of notice that the alkalised p-phenylene-diamines develop with sulphite of the alkalies without the use of potash.

Having now particularly described and ascertained the nature of this invention, and in what manner the same is to be performed, I declare that what I claim is :—The use of the following alkalised amido-compounds for the development of photographic images in layers containing halogene silver.

I. Alkalised amido-phenols of the composition $\begin{matrix}-OH \\ -NR_1R_2\end{matrix}$ amongst which the mono- and di-methyl- (ethyl-) derivatives of

1. p-amidophenol,
2. o-amido-m-cresol,
3. m-amido-o-cresol,
4. m-amido-(v-)m-xylenol,
5. m-amido-p-xylenol,
6. o-amido-(v-)o-xylenol,
7. o-amido-(s-)m-xylenol.

II. Alkalised diamines. The mono- and di-methyl- (ethyl-) derivatives of

1. p-phenylenediamine,
2. p-toluylenediamine,
3. p-xylylenediamine,
4. α-β-napthylenediamine,
5. α-α-napthylenediamine.

Improvements in Photographic Cameras.

No. 15,657. Fox Shew, 88, Newman-street, Oxford-street, Middlesex, and Lorenzo Cecil Vaughan Henry, Kylemore Castle, County Galway, Ireland.—*September* 3, 1892.

The invention has for its object improvements in photographic cameras, whereby lenses of shorter focus than that used with the camera in its normal or extended condition can be used and accurately focussed, and whereby the front of the camera can be tilted and swung within certain limits, thereby obtaining, amongst other advantages, that of a rising front or swing back.

The invention relates to that class of camera in which the back and front are connected by bellows, and in which the front is adjusted and fixed between hinge-bound side wings hinged to the back of the camera, thus obtaining rigidity in the camera when in use, and at the same time enabling it to be folded readily into a small compass.

According to the present invention, the hinge-bound wings are slotted longitudinally, and the slots are carried past the holes fitting over the lens when the camera is folded. One method by which this is effected is by the use of metal or other guides or rods, mounted with capability of being slidden across the holes, in order to continue the slots, but which, when the camera is folded, are pushed back, so as to leave the holes clear for the passage of the lens therethrough. Other methods of continuing the slots across the holes can, however, be employed.

In some cases we dispense with the lens holes in the wings, and carry the slots from one end to the other thereof, in which case the lens is removed from its fixing before folding the camera.

Thus the front of the camera can be adjusted in distance in relation to the back, so as to enable various lenses to be used therewith and accurately focussed and fixed by means of clamping-nuts or screws attached to the front of the camera, and passing through the said slots. By this arrangement the front of the camera can be tilted and swung within certain limits, and securely fixed in such position by the clamping-nuts or screws, thereby obtaining similar results to those of a double swing-back camera.

The invention also relates to a new method of raising the front of the camera, which is applicable to the description of camera above referred to, as also to other kinds of cameras.

For this purpose the front of the camera is formed with a frame or false front, which is provided with guides to receive a sliding lens board carrying the lens and the front of the bellows, a screw and nut or other suitable means being employed to raise and lower the said lens board.

In some cases we provide the sliding lens board above described with an additional board sliding in horizontal guides mounted on the said lens board. When employing this particular form of front, the lens is mounted in the additional sliding board. This will enable the lens to be moved in a horizontal as well as in a vertical direction.

The claims are :—1. In cameras of the character herein referred to, the slotted hinge-bound side wings, and the combination therewith of means for guiding the camera front in said slots, and for fixing said front at different distances from the back, substantially as herein shown and described, and for the purpose stated. 2. In cameras of the character herein referred to, the longitudinally slotted side wings, and the combination therewith of means for guiding the camera front in said slots, and for fixing said front at different distances from the back and at various angles therewith, substantially as herein shown and described. 3. In cameras of the character herein referred to, when employing perforated side wings to fit over the lens, the combination with such perforated side wings of longitudinal slots on each side of the perforation, and of movable means for continuing said slots across the perforation, substantially as herein shown and described, and for the purpose stated. 4. The combination with cameras of a sliding front whereby the lens is capable of being raised and lowered, substantially as herein shown and described. 5. The combination with cameras of a front provided with frames so guided as to be capable of being moved at right angles to each other, one of such frames carrying the lens, so that the latter can be moved either in a vertical or horizontal direction, or in both directions, substantially as herein shown and described. 6. In cameras in which the front and back are connected by a bellows body and held in position by hinge-bound side wings, the construction of such side wings with longitudinal slots, and the combination therewith of means for fixing the movable parts of the camera at any desired position in such slots, substantially as herein shown and described.

Improvements in the Art of Producing Coloured Photographs.

No. 5597. James William McDonough, 1124, Monadnock-buildings, Chicago, United States of America.—*September* 10, 1892.

My invention relates to the production of coloured photographs, and may be carried out in several different ways, one or two of which I will now set forth :

I take a plain glass plate and flow or cover it with a coat of varnish, or similar material which will dry tacky. I then dust the plate with a mixture of colours composed of fine or powdered particles containing the colours desired, and thus I obtain a coloured surface composed of particles lying side by side which have the properties of stippled colours instead of the properties of a true mixture of pigments.

In order to get these coloured particles I may use powdered glass, transparent pigments, gelatine, resin, or shellac, stained by aniline dyes, &c. The glass colours, after having been dusted upon the surface of the dry plate, may be melted into the plate, by fire, if desired.

In the preparation of a glass negative with shellac stained in colours, the plate may be flowed or covered with a plain collodion, to which is added a small quantity of glycerine, so that when the collodion is dry it will remain tacky enough to retain coloured shellac dust in a single layer. I then take a sufficient quantity of clean white shellac, dissolved in alcohol, to which I add aniline colours, say, for one lot, red and yellow colours in such proportions that the result will be a red which, when viewed by transmitted light in thin layers, will cut off or absorb as much green, blue, and violet as possible, or which, in other words, will transmit as far as possible a pure red. Another lot is coloured with as pure a green as may be formed by mixtures, adding

yellow to absorb blue. Another lot is coloured blue. As the mixtures of colours formed in this way by red and green do not form a bright yellow, I may use, in addition, another lot coloured as near the yellow of the spectrum as possible. These lots, after being thus coloured, are allowed to dry, forming coloured masses, which are then reduced to powder by grinding, sifting, &c.

If, now, proper proportions of red and green are mixed, a nearly black mass will be formed, and, if proper proportions of red, green, yellow, and blue are mixed, a mass will be formed that is nearly black; but if this same mixture is dusted, or thinly spread, upon the prepared surface, it will reflect or transmit a mixture of all these colours, which will be white in proportion to the purity of the colour, cleanliness of the mixture, and the quantity of light transmitted or reflected. The glycerine may be washed out, so that only the coloured particles in the masses in which they are arranged remain. When viewed under the microscope, the white surface is seen to be composed of a multitude of different coloured particles lying side by side, and separated by small distances.

By subjecting the plate thus prepared to just sufficient heat to melt the shellac, two results are obtained; first, the powdered particles melt, and fill the gaps, forming a surface which, when viewed in the microscope, resembles a window formed of a mosaic of small coloured pieces, each adjoining the other, while, if the heat be carried further, the edges melt into each other, and further mixtures of colours are obtained; second, the surface of the plate which, before heating, reflects all the colours, and resembles the surface of ground glass, or glass covered with a white powder, in what is termed a matt surface, becomes, under the influence of heat, transparent by the flattening of the particles. This result may also be obtained in a measure by covering the surface with varnish, so as to make it smooth.

A plate formed in this way upon any suitable material may be flowed or covered with such sensitive compounds as are used in taking photographs.

Instead of treating the glass plate with a coat of varnish or similar material which will dry tacky, and then dusting such plate with a mixture of colours, as above described, I may take a support of plain glass, celluloid, paper, or other suitable substanee, upon the surface of which is a sensitive photographic coating, preferably forming what is known as an orthochromatic dry plate. This may be rendered tacky by immersing in water or diluted glycerine. If preferred, however, the plate may be used before it gets quite dry in the course of its manufacture. I dust the plate either while it is somewhat moist in the course of its manufacture, or after it has become tacky, as above explained, with a mixture of colours composed of fine or powdered particles containing the colonrs desired. The particles, however, may, if preferred, be applied in other ways so long as the same result is secured. I thus obtain a coloured surface composed of particles lying side by side which have the properties of stippled colonrs, as above explained. In the latter of the methods of forming the plate above described, after the colours are applied, the surface may be flowed with a thin coat of gelatine, which will penetrate the spaces between the coloured particles, or the ground and coloured particles may be coated with gelatine before applying them to the tacky surface by mixing them with a small quantity of dissolved gelatine and regrinding them, according as a matt or smooth surface is required.

The process of producing the effect called colour above described is by absorption of light; but, inasmuch as colour effects may be produced by refraction, dispersion, or diffraction of light, I do not mean to limit myself to absorption only as the means of producing them.

The photographic plate thus obtained, consisting of coloured particles applied to its sensitive surface, may be exposed to the action of the light from the object to be photographed, through a camera, in such manner that this light will pass through the coloured particles and affect the sensitive film, thus producing a latent image of the object.

The plate may then be developed by the use of the so-called alkaline developer, so that the coloured particles will adhere to the surface, which is penetrated by the same coloured light as the particles themselves, because gelatine is rendered insoluble in proximity to the silver bromide particles in the sensitive compound where acted upon by light. Thus particles which do not allow the passage of coloured rays, on account of absorption, may be washed off, because as to such particles the gelatine remains soluble. Thus blue rays will cause blue particles to remain as an image; white light, all the coloured particles in that space acted upon by white light; and all will be removed where black occurs, which does not act upon the photographic film. After the development, the picture may be treated with thio-sulphate of soda to remove the sensitive compound not acted on by the light and developer. By thus developing the plate, a picture composed of the particles of silver and the coloured particles remaining on the plate after the development is produced.

The use of orthochromatic dry plates and coloured screens before the camera for the purpose of sifting light and regulating the action of different colours upon the film is too well known to require explanation. I will merely add that the particles are dusted, spread or placed upon the plate in such proportions as to produce a white or transparent surface.

It is obvious that many variations may be made in the details of my invention without departing from the spirit thereof.

The claims are:—1. The process of preparing photographic plates, which consists in covering them with coloured particles, and then applying a sensitive compound to them, substantially as and for the purpose set forth. 2. The process of preparing photographic plates, which consists in covering them with coloured particles, then subjecting them to heat, and then applying a sensitive compound to them, substantially as described. 3. A plate for photographic purposes having upon its surface a layer of different coloured particles lying side by side, and in such proportions as to produce a white or light-coloured transparent surface, to which may be applied a sensitive compound, substantially as described. 4. A plate for photographic purposes formed of glass or other suitable material of any colour, a layer of different coloured particles spread thereon, and a film of sensitive photographic compound spread over the particles, substantially as described. 5. The process of preparing photographic plates, which consists in applying a sensitive compound to them and then covering them with coloured particles, substantially as described. 6. The process of preparing photographic plates, which consists in applying to their sensitive surface particles of glass or other substances which show colours by absorption, refraction, dispersion, or diffraction, substantially as described. 7. The process of preparing photographic plates and pictures, which consists in applying a sensitive compound to them, covering them with coloured particles lying side by side in such proportions as to produce a white or light-coloured transparent surface, and then washing out such particles as are not acted upon by light, substantially as described. 8. A plate for photographic purposes, having a sensitive surface to which is applied a layer of different coloured particles lying side by side and in such proportion as to produce a white or light-coloured transparent surface, substantially as described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
October 10	Darlington	Trevelyan Hotel, Darlington.
,, 10	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 10	Lantern Society	20, Hanover-square.
,, 10	Norfolk and Norwich	Bell Hotel, Norwich.
,, 10	North Middlesex	Jubilee Hall, Hornsey-road, N.
,, 11	Derby (Annual)	Smith's Restaurant, Victoria-st.
,, 11	Manchester Amateur	Lecture Hall, Athenæum.
,, 11	Newcastle-on-Tyne & N. Counties	Mosley-st. Café, Newcastle-on-Tyne.
,, 11	Paisley	Committee Rm., Free Lib. & Museum
,, 11	Stockton	Masonic Court, High-street.
,, 12	Ipswich	Art Gallery, Ipswich.
,, 12	Leicester and Leicestershire	Mayor's Parlour, Old Town Hall.
,, 12	Munster (Annual)	School of Art, Nelson-place, Cork.
,, 12	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 12	Putney	High-street, Putney.
,, 12	Reading	
,, 12	Stockport	Mechanics' Institute, Stockport.
,, 13	Birkenhead Photo. Association	Association Rooms, Price-street.
,, 13	Birmingham	Lecture Room, Midland Institute.
,, 13	Bradford Photo. Society	50, Godwin-street, Bradford.
,, 13	Camera Club	Charing-cross-road, W.C.
,, 13	Cheltenham	
,, 13	Hackney	206, Mare-street, Hackney.
,, 13	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 13	Manchester Photo. Society (An.)	36, George-street, Manchester.
,, 13	North Kent	Gravesend.
,, 13	Oldham	The Lyceum, Union-st., Oldham.
,, 14	Cardiff	
,, 14	Holborn	
,, 14	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 14	Maidstone	"The Palace," Maidstone.
,, 14	Richmond	Greyhound Hotel, Richmond.
,, 14	West London	Chiswick School of Art, Chiswick.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 29,—Mr. J. Barker in the chair.

MISS CATHARINE WEED BARNES ELECTED AN HONORARY MEMBER.

Mr. A. HADDON said that he had no doubt the proposal he had to make would meet with the approval of the meeting; this was, that Miss Catharine Weed Barnes be elected an Honorary Member of the Association. Miss Barnes had given a certain amount of time to the preparation of the paper she had recently brought before them, and he thought it would be some reward to her to elect her an honorary member.

Mr. F. A. BRIDGE seconded the motion, which was carried unanimously.

The following question from the box, "Will some one please give a formula for a really rapid gelatine emulsion, and the best method of breaking it up, washing and filtering it in large bulks?" was postponed till the next meeting.

THE EXPANSION OF AMMONIA SOLUTION.

Mr. HADDON observed that he considered it the duty of every member to correct errors provided they were supposed to be based on scientific data. In many books of science there were errors which it was unfortunate should be copied and become current knowledge. There was an article by Mr. J. Cadett in the first number of his firm's monthly magazine, *Dry Plates*, which gave a certain amount of information with regard to ammonia, and especially as regarded its dilution. Now, most people knew that, if one took a pint of alcohol and mixed it with a pint of water, one did not obtain two pints by measure but something less. It was the same with sulphuric acid. The passage in Mr. Cadett's article to which he took exception was as follows:—"Ammonia has the remarkable property of having the same bulk, *per se*, in all solutions of various quantities of water—that is to say, it neither expands nor condenses in consequence of combining with, or being diluted by, water, in which it differs essentially from the fixed alkalies and the liquid acids." That (said Mr. Haddon) was a mistake. Most probably Mr. Cadett himself was not responsible for the statement, but had copied it, and not being able to verify the quotation had given it to the world as a fact. According to Watts' *Dictionary of Chemistry*, one volume of water, by absorbing 505 volumes of ammonia, occupies 1·5 volume of the sp. gr. ·9; and this, when mixed with an equal bulk of water, yields a liquid of sp. gr. ·9455. Whence it appears clear that ammonia expands on dilution, although it does not actually seem to have been proved by experiment. Therefore he thought it might be worth while to make the experiment and satisfy himself as to whether ammonia when diluted was really of the same bulk, or whether there were any changes in one direction or in another. On a large glass tube he accordingly blew two bulbs; the measure of capacity of the lower part of the tube was 97 c.c., which he indicated by a scratch, another scratch being made to indicate a capacity of 116·5 c.c. Having filled up to the first scratch with distilled water by means of a funnel, he then poured into it the strongest ammonia—most probably the ordinary ammonia ·880. In order to make sure that the temperature was uniform, the tube was immersed for a quarter of an hour in water at 19° C., and was adjusted so that the meniscus exactly corresponded with the upper scratch on the glass

The water and ammonia being mixed, the solution was tested for increase of volume, and, in order to make sure that temperature had nothing to do with it, the tube was again immersed in water at 19° C. To ascertain the percentage of increase in volume he poured into the small tube, before sealing it on to the larger, 5 c.c. of water, and found that they occupied exactly 24 c.c. in length of the tube, the increase in length thus occupying 3·3 c.c., which comes to about ·37 per cent. increase in volume. Mr. Cadett had founded certain conclusions on the assumption that there was no change when ammonia was diluted; so it would naturally be that those calculations were not true. For instance, as to Mr. Cadett's statement that seventeen grains of actual ammonia were dissolved in a tenth of a gallon of water for a change of ·001 in the specific gravity of the solution, Mr. Haddon quoted two examples from *Watts's Dictionary of Chemistry* to prove that the latter and Mr. Cadett differed. Ammonia (said Watts), containing 36 per cent. of real ammonia, has a specific gravity of ·884. Subtracting this number from 1·000, and neglecting the decimal point we get Mr. Cadett's strength number, 1·000 – ·884 = ·116. 116 × 17 = the total number of grains of ammonia in a tenth of a gallon of water = 1972 grains. But taking ammonia solution, specific gravity ·921, which, according to the same authority (Watts), contains 18 per cent. of real ammonia, and following the same rule, 1·000 – ·931 = ·069, 69 × 17 = 1173 grains per tenth of gallon of water. This number, according to Mr. Cadett, ought to be 986 grains, a difference of about 16 per cent. of real ammonia. Some time back, when studying the best method of obtaining ammonia of a constant strength, he prepared a curve on squared paper, showing the relation of percentage strength to specific gravity, and, instead of being a straight line, it was a decided curve, showing that in all cases the specific gravity of a diluted solution was less than it ought to be if there was no change in volume. It was because he thought such a mistake ought not to be spread among photographers as a fact that he undertook the above experiment. He was of opinion that few men (even scientists) knew of the expansion of ammonia on dilution.

PHOTOGRAPHS BY MR. SHAPOOR N. BHEDWAR.

Mr. Snowden Ward passed round five large platinum photographs showing the initiation of Mr. Bhedwar's son as a Parsee priest. It was a subject that had never been pictorially treated up to the present time. Two Parsee priests were the models, and the vessels shown in the pictures were the actual vessels used in the temple, so that there was absolutely nothing of a "studio character" about the pictures except the backgrounds. Mr. Ward stated that the *Illustrated London News* would reproduce the pictures in an early number, and would also give a description of the rite of initiation.

GELATINE PLATES FOR LANTERN SLIDE WORK.

In the absence of the author, Mr. George T. Harris, a paper on the above subject was read by the HON. SECRETARY (Mr. R. P. Drage) [see page 5 of the LANTERN SUPPLEMENT]. At its conclusion,

Mr. W. E. DEBENHAM said he could see no advantage in the use of two kinds of gelatine, and thought the use of a hard and a soft kind a superstition remaining from the early days of gelatine plate-making. The preparation of the emulsion would be simplified by the use of one gelatine. He himself had made the fastest emulsions with hard gelatine throughout.

Mr. J. S. TEAPE remarked that Mr. Harris stated that he had obtained no change of colour with the silver intensifier; but he (Mr. Teape) had found that, unless the image was black to start with, he never remembered intensifying without a change of colour. Then, as regards fixing, he never used the combined fixing bath. Plates after development were not necessarily yellow. He always kept a clear hypo bath for lantern work.

The Chairman showed some albumen negatives about thirty years old which he thought might interest some of the younger members who had never seen such films. He drew attention to their qualities of fineness and clearness. In reply to a question, he said the exposure required was four to five times that of wet collodion. Dust was a very great difficulty—in fact, it was one of the nuisances of the process.

Mr. W. H. BARNES said the negatives showed less grain than those otherwise produced; but, all the same, he did not think it a practical process.

Several members having described the boxes they had devised and used for drying purposes, a vote of thanks was passed to Mr. G. Harris for his paper. During the evening, Mr. Haddon and Mr. Snowden Ward were similarly thanked for their interesting communications.

Hackney Photographic Society.—September 27, Mr. Walter Potter presiding.—The Hon. Secretary announced that the judges in the forthcoming competition would be Captain Abney, Colonel J. Gale, and Mr. Ralph W. Robinson. Works were shown by Messrs. Pollard, Nunn, Dean, and the Hon. Secretary. From the question box: "Does bromide paper lose rapidity with age?" Mr. Barker had used some two years old with little loss of rapidity. Mr. S. J. Beckett had used some four years old. Another question was: "Can I use amidol without bromide, and can I over-develop with it?" The HON. SECRETARY said he had used it without bromide, and had found it work satisfactorily. Mr. SODEAU said it was possible to over-develop with amidol. A third question was: "Should chloride of gold be kept alkaline in solution?" Mr. SODEAU said it should be slightly acid, but it was rarely ever done. The Hon. Secretary then gave a lantern lecture on his holiday in the Isle of Man (in conjunction with Mr. Dando) during which over eighty slides were shown.

Leytonstone Camera Club.—The opening night of the winter season was held on the 1st inst, with an address by the President, Dr. W. Pickett Turner, who opened by complimenting the Club on the position it had made, and the strength it had attained, the muster being ninety-six members. He next went on to the science and art of photography, dealing with the chemistry, first giving, with the aid of the black board, the various formulæ of the various salts and compounds used in photography, explaining that the rational changes were not chemical but molecular, advising beginners to study orthodox chemistry, first taking Roscoe or Fownes as their Bible. He next went on to the science of optics, and then touched on the art side of photography, and explained that manipulative dexterity can be acquired by practice, and how highly important for success it was that the best apparatus that could be afforded should always be had, particularly the lens, which was a *sine qua non* to good work, explaining that they were the cheapest in the long run, as they were always worth their money. The collodion process was next touched upon, and he was of opinion that, notwithstanding the many advantages of the dry plate, collodion still held its own for transparency and lantern slides. There was, he said, a branch of photography which had almost died out, but was now coming to the fore again, he alluded to stereoscopic photography; he thought it one of the highest branches, and gave the most charming results, and strongly advocated it being taken up by the members. In his closing remarks, the coming exhibition was alluded to, and he particularly urged the importance of all members exhibiting, and to dispel that feeling of "It's no use, So-and-So does much better work than I," explaining that it was just as likely for a good half-plate to take a medal as a 12×10. Sample packets of the Ilford Printing-out Paper were next distributed, and the evening closed with a hearty vote of thanks to the President for his highly interesting and instructive address, which had been attentively listened to by about forty members.

Aldenham Institute Camera Club.—From the very constitution of our club, limited as it is to members of the Institute, a large annual increase in its members cannot be expected, but during the past year four gentlemen have joined our ranks, which makes a present membership of fourteen. Though the numbers have been small, the loyalty and enthusiasm have been great, as the following particulars will demonstrate. During the year twenty meetings have been held, with an average attendance of 12·5. Six of these meetings, which were thought to be of general interest, were thrown open to the Institute, the result being an average attendance of 24·3. At the competition held in January, fifty-four prints and twenty-four lantern slides were submitted for consideration, the Judge's award being as follows:—Architecture, Mr. G. E. Harris; landscape, Mr. H. J. Redfern; seascape, Mr. G. E. Harris; lantern slides, Mr. G. E. Harris. Our Secretary also gained the medal kindly presented by Mr. James Robertson, our President, for the best print entered for competition. On April 30 an exhibition of the Club's work was held; 105 pictures were on view, including a few kindly lent by Messrs. Nesbitt & Co. The experiment was fully justified by the amount of interest evinced. We hope during the present season to organize a larger exhibition. Monthly excursions were arranged by the club during the summer, the places visited being Leigh and Southend, Burnham-on-Crouch, Hayes Common, Keston and Down, and Broxbourne. Although bad weather almost invariably accompanied us, the outings always proved highly enjoyable. At the late Photographic Convention held in Edinburgh, our Club was represented by Messrs. Redfern and W. Pringle, from whom we hope to receive ere long a narration of their adventures.

Harlesden and Willesden Photographic Society.—October 4, Mr. J. Naylor in the chair.—A lengthy discussion took place upon printing processes for various negatives. The PRESIDENT commented upon their high sensitiveness in dull weather. An excursion to Windsor was arranged.

Putney Photographic Society.—October 3, Dr. J. E. Farrar in the chair.—The following five gentlemen were unanimously elected members, viz., Messrs. Beatie, Blake, Noble, Ward, and Woolnough. Mr. Gorin showed negatives on the Sandell plate, taken under very varying circumstances with uniformly good results; he also showed the effect caused by interleaving exposed plates with the paper usually sold for this purpose, the images of the sheets were imprinted on the negatives, of course with disastrous consequences. It was generally agreed that it was best to pack exposed plates film to film direct, and to jamb them tightly in the boxes, so as to prevent play in any direction. Mr. POOLE said that in his hands spirits of turpentine applied with a soft rag formed an efficient and convenient reducer of dense negatives, lantern slides, and opals. For local or general treatment, he stated that it had advantages over methylated spirit similarly applied. Mr. Zachariasen showed a number of prints illustrating a series of experiments carried out by him to ascertain the effects of varying treatment of gelatino-chloride papers. The prints showed the difference between thorough washing and merely rinsing, between a strong and a weak fixing bath, between acid and alkaline fixing baths, &c. Three brands of paper were each toned in five different toning baths. The results of altogether 120 different experiments were shown; the characteristics of each paper, bath, and detail of manipulation were pointed out and summarised. He also described some experiments undertaken to find a suitable developer for snap-shots taken on a recent tour in Norway, and which all suffered, to some extent, from under-exposure. After the pyro formula sent out with the plates, he tried rodinal, eikonogen, hydroquinone, and amidol, singly or combined, as advocated by the champions of each; all, however, with more or less unsatisfactory results. He then reverted to pyro and ammonia, but made up in the following proportions, viz., pyro, four grains; bromide of potassium, one grain; ammonia (·880), three minims to the ounce of developer; to which were added two minims when the image was fairly up. This developer worked very satisfactorily, and was finally adopted, the results being above expectations. This was confirmed by the experience of Mr. Gorin, who had used it for snap-shots, taken on Edwards' instantaneous isochromatic plates, on his recent tour in Morocco. Mr. Zachariasen's negatives were taken on Paget 50-times plates, the favourable opinion of which was confirmed by Mr. Blake. Messrs. Beckett "Bynoe" printing frames were exhibited in various sizes, and were favourably commented upon by members who have had them in use for some time.

Richmond Camera Club.—Report and Balance Sheet for the year ended August 31, 1892:—In presenting their second Annual Report the Committee are glad to be able to congratulate the members on the continued and increased success of the Richmond Camera Club. Though not strong in point of numbers compared with some other Photographic Societies, the membership shows a steady increase, twenty new members having been enrolled during the past year, while only four have resigned. Amongst the recruits are some of the best-known local amateurs. Weekly meetings have been held throughout the year, and those during the winter months were very well attended. The experiment of keeping up the meetings during the summer was scarcely justified by its result, the meetings, which were

for the most part informal, having been but thinly attended. The demonstrations given and papers read at the meetings were of a very varied and interesting character, and the practical utility of the Club is traceable in the marked improvement in the general quality of members' work, especially, perhaps, in their lantern slides. Two important steps were taken during the year in the establishment of a library and the acquisition of an optical lantern. Several members have presented books to the library, which already contains most of the works in general use on photographic subjects. The cost of the Club lantern, an excellent single instrument by Otway, with the necessary accessories, was almost wholly defrayed by the contribntions of members. The Club is now affiliated to the Photographic Society of Great Britain, under the scheme lately established by the latter Society. Two delegates have been appointed to represent the Club at affiliation meetings. The cordial thanks of the Club are due to all those who have contributed to make the past year's working so satisfactory and so pleasant to review, and especially to the various firms and gentlemen who have given demonstrations, and to the photographic and local press for so freely extending the hospitality of their columns to the reports of the proceedings of the Club.

Liverpool Amateur Photographic Association.—The President (Mr. W. Tomkinson) occupied the chair, and there was a very large attendance, attracted, no doubt, by the announcement that Mr. George E. Thompson would deliver his new lecture, entitled *Hill-top Cities of Etruria*, illustrated by lantern slides from negatives taken by the lecturer during the spring of this year. Mr. Thompson holds such a high position in the estimation of the members, both as a lecturer and as a photographer, that he is always sure of a crowded audience. After the election of seven new members, Mr. Thompson commenced his lecture, of which the following is a synopsis. Orvieto: Its famous cathedral; its old gates, and precipices. Viterbo: Ancient walled town; fountains, buildings, and monastery of La Quercia; grand old garden. Excursion to Caprarola. Montefiascone, and down to Lake Bolsena; basaltic columns; old town. Orte, on the Tiber. Narni: Ruined bridge; quaint streets. Segni: On its crags. The monastery of Monte Cassino. Corneto: Etruscan tombs 2400 years old; museum; sarcophagi; Etruscan pottery. Carrara: Marble quarries; grand scenery of the Marble Mountains; a marble Venus come to light. The lecture was most interesting throughout, and the slides were of the highest quality. This was particularly noticeable when the pictures of the Carrara marble mines were being shown. The enormous extent of these considerably surprised most of the members, and the beauty of the Marble Mountains was expressed in the photographs with wonderful realism. At the close of the lecture, Mr. B. J. Sayce proposed a hearty vote of thanks to Mr. Thompson, and this was carried with acclamation. On the motion of the lecturer, a cordial vote of thanks was then given to Mr. F. Anyon for the admirable way in which he had worked the Society's new lantern. It is a matter for congratulation, and was much commented on, that, although the large room was crowded for about two hours, the temperature and atmosphere were most comfortable and agreeable throughout, thanks to the efficient ventilation and the electric light.

Liverpool Camera Club.—September 28, Mr. W. Hayward in the chair.—The paper for the evening was furnished by Mr. T. Edwards, who had for his subject *Hints on the Manipulation of the Lantern*. Mr. Edwards had kindly brought his own lantern, which he described fully, and showed many improvements which his large experience had suggested. Mr. Edwards then proceeded to explain the working of the lantern, describing every particular and conveying many useful hints to the members. The lecturer afterwards passed a number of slides through the lantern, thus bringing to a close an interesting and instructive paper. The first smoking concert of the Winter Session is to be held in the club rooms on Wednesday, October 12.

South Manchester Photographic Society.—September 26, annual meeting, Mr. W. I. Chadwick in the chair.—Messrs. Holmes, Hunt, and Norris were elected members. The Hon. Secretary then read his report for the present session, which was as follows:—"The officers have to congratulate the members on the progress made by the Society since its formation in February of the present year, the number of members now enrolled being thirty-three. The financial position of the Society was very satisfactory, there being a substantial balance to its credit." The report then went on to describe the meetings and the various papers read, among them being *Photography by Artificial Light;* this was followed by a practical demonstration, *Platinum Printing*, by the Hon. Secretary (M. W. Thompstone); *Magic Lantern Matters*, by the Chairman (W. I. Chadwick), &c. A good deal of attention had been devoted to stereoscopic work, and some very beautiful transparencies were shown at several of the meetings. Discussions had also arisen from questions as regards developing, printing, toning, &c. At the popular meeting held in March, a paper was given on *Holiday Reminiscences, including a Trip to the Isle of Wight*, by Mr. W. I. Chadwick, which was very well attended by members and their friends. The outdoor rambles had been fairly successful, those which have been held being well attended. The Hon. Treasurer's balance-sheet was then presented and passed. The election of officers for the ensuing year followed, and after a short discussion was decided as follows:—*Chairman:* Mr. W. I. Chadwick.—*Vice-Chairman:* Mr. W. Linnell.—*Hon. Treasurer:* Mr. E. N. Bowden.—*Hon. Secretary:* Mr. M. W. Thompstone. The meeting then adjourned to the large Lecture Hall, where the Hon. Secretary gave a short paper on *Picturesque England*, illustrated with some eighty slides specially selected for the paper. The places visited included the English lake district, the old abbeys of Yorkshire, the River Thames, Devonshire, Cornwall, Derbyshire, concluding with Shakespeare's country. At one part of the lecture some miscellaneous slides and cloud and water effects, snow effects, &c., were introduced.

Port Elizabeth Amateur Photographic Society.—The first annual exhibition and entertainment in connexion with this Society was recently held. The first photographic item on the programme created great interest. It consisted of taking a photograph on the stage by means of a magnesium flash; the development of the negative, the making of a lantern slide, which was then placed in the lantern, and the whole of the wonderful process of development of the latent image was visible to the audience on the sheet in front of the lantern. It should be noted here that this experiment has never been attempted before in this colony; in fact, it has been performed in England but a few times; and when we inform our readers that it was a complete success, it says much for the proficiency of the members of the Society. Mr. D. M. Brown was chosen as the subject to be operated upon in this experiment, and having been placed in position on the platform, his photograph was taken with the aid of a single magnesium flash. After development, Mr. Alcock made the lantern-slide in view of the audience, and having placed the slide with its developing solution in the lantern, the well-known features of Mr. Brown became gradually visible on the sheet. The successful experiment was greeted with well-deserved applause. During the time occupied in the first instance by the development of the negative, the audience had an opportunity of inspecting the large number of perfectly finished photographs which were exhibited in the hall. These were without exception very good, and were all the work of amateurs, and would have done credit to any London studio. After the completion of the lantern-slide development, a display of local views, &c., contributed by members of the Society, took place, and, as lantern slides, would take a lot of beating.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

"COOL WATERS."

To the Editor.

Sir,—I have been away from home or would have replied sooner to the letter of Messrs. Morgan & Co. in your issue of September 23.

I cannot reconcile their statement that they "never suggested or in any way implied that the photograph was by themselves" with the fact that they withheld information as to the authorship, and thereby misled Messrs. Nops & Tarrant (whose letter is in the same number of the Journal), there having been, by their own admission, a ticket attached to the picture when in their window which stated that it was "photographed from nature, and enlarged by J. Vaughan." The ticket itself told only half the truth, for the enlargement merely was Mr. Vaughan's part, the negative, as stated in my previous letter, having been taken by myself, which I am able to substantiate.

Messrs. Morgan & Co. are quite mistaken in supposing that they have a "legal purchased right," to quote their own words, to put their names on prints from negatives which they have purchased. The Copyright Act relating to photographs, of which there is a clear summary by Mr. Le Neve Foster, Barrister-at-Law, in your Almanac for 1869, says: "The absolute property and copyright belong to the person taking the negative on his own account (not so in the case of portraits taken on commission), and even if the author has disposed of his copyright and negative the *purchaser*, in issuing prints from any of his purchased negatives, must *not* place *his* name, initials, or monogram on them, or the name, &c., of any one who did not execute the work." The Act also makes it "penal in any one doing this so as to make it appear that the prints are from the work of some one who in reality did not execute the negative."

I am sorry to trouble your columns with this matter, but do not think it right that such credit as is due for the photograph should be appropriated by persons who had no part whatever in its production. It is not yet too late for Messrs. Morgan & Co. to express some regret for their procedure.—I am, yours, &c.,

Henry Whitfield.

Clifton, October 3.

"THE PHOTOGRAPHER'S RECORD."

To the Editor.

Sir,—Since issuing the first number of our little paper we find that we have adopted a title that was already in use by Messrs. George Mason & Co., the well-known dealers in photographic material, of Sauchiehall-street, Glasgow. We therefore tender Messrs. Mason our apologies, and beg to inform your readers that we have modified the title of our paper, which will henceforth be known as "The Photographer's Record," and will, as before stated, be sent post free to professional photographers on receipt of business card, and supplies forwarded, carriage paid, to secretaries of Societies and dealers in photographic goods for distribution.—We are, yours, &c.,

Elliott & Son.

Photographic Printing, Enlarging, and Dry Plate Works,
Park-road, Barnet, Herts, October 3, 1892.

MR. BERGHEIM NOT A "VIENNA PHOTOGRAPHER."

To the Editor.

Sir,—In the article on "The Photographic Exhibition" in your last issue I am twice mentioned as "J. S. Bergheim, the Vienna photographer." I beg to state that I am simply an amateur of little over three years' standing, and without a studio, and that I happen now to reside the greater part of the year in Vienna.

It may interest some of your readers to know that the "too soft" *Study of a Head* (No. 18) is from an untouched negative, and was taken with an uncorrected single lens, and shows what can be done with such simple means. Hence the title *Study of a Head*.—I am, yours, &c.

October, 3, 1892.

J. S. Bergheim.

LEYTONSTONE CAMERA CLUB EXHIBITION.

To the EDITOR.

SIR,—In reply to the query of the numerous applicants for entry forms for our forthcoming exhibition on November 10, 11, and 12 next, as to who are the judges, will you kindly announce that A. Horsley Hinton, Esq., Rev. F. C. Lambert, and E. J. Wall, Esq., have to officiate consented on that occasion.

Intending exhibitors of apparatus, &c., and those wishing space for stalls, are requested to send in their applications as soon as possible. Thanking you in anticipation, and apologising for taking up so much space in your valuable JOURNAL, I am, yours, &c., ALBERT E. BAILEY,

Hon. Secretary Exhibition Committee.

Rose Bank, South-west-road, Leytonstone.

MR. HUBERT AND "UNFORTUNATE."

To the EDITOR.

SIR,—Some time ago Mr. Hubert, I believe, promised to report *re* progress of "Unfortunate" printer. That report has not yet appeared, although I think I am correct in stating that the three months have elapsed.—I am, yours, &c. H. J. WILLIAMS.

2, *Fort-street, Douglas, Isle of Man.*

Exchange Column.

Exchange Safety bicycle for Talmer hand camera and cash, or half-plate camera, &c.—Address, W. E. PEARSE, 16, Thanet-street, London, W.C.

Wanted, quarter-plate, with Eastman carrier and casket of lens, in exchange for complete full-plate outfit, nearly new.—Address, A. E. FOSTER, Thornbury, Bradford.

Will exchange excellent background, interior, for another good interior. Exchange photographs and particulars.—Address, J. HOATON, Photographer, Caroline-street, Cardiff.

Wanted, good cabinet portrait lens, about eight inch focus, by Ross or Dallmeyer, or any good recognised maker, in exchange for first-class cripper tricycle, suitable for lady or gentleman, with luggage carrier and accessories. Cost £21. Also two glass cases of stuffed birds, one perrigren falcon and one bittern; for good interior or plain backgrounds.—Address, B. Pearce, Machynlleth.

Will exchange *Studies in Artistic Printing*, by C. W. Hearn, *A Manual of Photography*, by Robert Hunt, F.R.S., and THE BRITISH JOURNAL OF PHOTOGRAPHY, Nos. 1525 to 1636 (one or two missing), containing the articles "Coloured Photographs" and "The Art of Retouching," by Redmond Barratt, for studio stand, tripod, or accessories.—Address, S. L. LEES, 11, Claremont-terrace, Grove Green road, Leyton.

Answers to Correspondents.

All matters for the latter portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," 2, *York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & CO.," 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

John Reese Jones, Maidstone.—*Cabinet photo of Rev. Dr. Selgwick.*

David Stickells, Cranbrook, Kent.—*The first passenger train on the Paddock Wood and Cranbrook Railway taken at Hope Mill Station.*

*** Several answers to correspondents are unavoidably held over.

F. C. BEACHAM.—The medium appears to answer.

F. I. C. wishes to know the address of manufacturers of "wire glass."

C. F. TREBLE.—We shall probably not again refer to the matter.

E. YEOMAN.—Your suggestion is an excellent one, and we will adopt it.

R. H. MCBEAN.—Our correspondence columns are open for the ventilation of the subject.

J. J. P. BOWLER.—Sponge the surfaces of the pictures over with beer, and employ orthochromatic plates.

R. FRANKLIN.—Your query in no way relates to matters photographic. Better consult such a work as *Spon's Workshop Receipts.*

EDWIN PETIT.—Obtain Burton's book on *Photographic Processes*, published by Marion & Co., Soho-square. In this column space is too limited to give working details of processes.

ALEXANDER BROTHERS.—There is an article on "Solar Enlargements" in the ALMANAC for 1870. The volume is out of print, but may no doubt be obtained by advertising for it.

R. PRITCHARD.—Morrell, of Great St. Andrew-street, W.C., and several other firms whose addresses you will find in our advertisement pages, will supply you with mouldings for frames.

OXON.—Paraffin oil casks are the cheapest receptacles that can be used for the collection of silver residues. The smell of the oil will be of no moment. Hence your fears are unfounded.

G. S. D.—Mr. Valentine Blanchard's address is the Rectory Farm, Harston, near Cambridge.

J. B.—We cannot undertake to recommend one maker's lenses in preference to those of another.

G. B. RODGER.—1. Messrs. Tunny, of Edinburgh, would probably produce the enamels of the desired tone for you. 2. The carbon process is that generally employed for "red prints."

PUSH.—Any of the coal-tar colours that are soluble in alcohol, and the majority of them are, will do to add to matt varnish to give it a tint. Aurine, for example, is very soluble in spirit, and would answer the purpose.

R. C. E.—It is quite possible that you may obtain some sharp hand-camera pictures of the steeplechase next month; but rapid plates must be employed, and also a lens that will define with a large aperture, say *f*-6. All, however, will depend upon the weather at the time. By all means be ready to make the attempt.

S. GEDGE.—Several attempts have been made to induce the different railway companies to treat photographers, as regards reduced fares, on the same terms as they do members of angling societies, but without avail. The West London Society quite recently took the matter in hand with vigour, but the companies proved obdurate.

A READER (Kilburn).—Any manual of photography will give the desired information. An elaborate article on the subject will be found in the ALMANAC for 1888, and plenty of articles in the other ALMANACS and back numbers of the JOURNAL. Space in this column is too valuable to permit of repeating what is to be found in recent issues.

A. COLLYER.—Any of the published formulæ for toning baths will yield rich tones, of a more or less purple shade, with good paper—that is, if the negatives are of the right character. The tones of a print, when rich purple ones are in question, as we have frequently explained before, are dependent upon the negative. The toning-bath formula is quite a secondary matter.

N. A. W.—Plate glass must be used for collotype work, but not necessarily so thick as that mentioned. For the smallest sizes three-eighths of an inch will be ample. For the largest sizes half an inch to five-eighths is quite sufficient. Anything thicker than that very materially increases the cost of the glass, and is not really necessary, unless the bed of the press is not perfectly true.

R. CORDWELL.—Eosine, erythrosine, cyanine, and other substances recommended for orthochromatising plates, can be obtained from most, if not all, photographic chemists. They are also, we believe, supplied by many dealers in photographic goods, or they will procure them to order. The materials, with the exception of the last-mentioned, are not at all expensive.

CHAS. E. LAST says: "Can you tell me the best means of obtaining the following information? I want to find the address of a good photographer at Pau, and also at Peune or Villeneuve-sur-Lot, France, whom I could apply to for photographs of one or two places in the neighbourhood. I thought you perhaps might know the means of finding any addresses in the profession, or could tell me how to find them."

B. BENSON, JUN.—If the gentleman sat at your solicitation, and accepted a dozen prints for doing so, you were perfectly justified in making the portrait copyright. The gentleman, it seems to us, has no right to give another photographer permission to copy the picture, as you hold the copyright in it. There is nothing, however, to prevent him from giving the man a sitting in the same way as he did to you.

CELT.—If the bath be made according to the formula given, it will certainly yield good tones with gelatino-chloride paper. But the stability of the print is somewhat doubtful, as the colour is produced by sulphur toning. Sulphur toning, as some of the oldest prints prove, does not of necessity produce fugitive results, although, while other methods which promise greater stability are available, its use should be eschewed.

ORLANDO.—There is always a certain amount of risk in printing from gelatine negatives before they are varnished; but if the hyposulphite is thoroughly removed, and the film perfectly dry, and the paper quite dry also, the risk is reduced to a minimum. As a matter of fact, a very large proportion of the negatives taken, particularly by amateurs, are printed from before they are varnished, if, indeed, they get varnished at all.

C. E. S.—Unless the seller is a duly qualified pharmaceutical chemist, it is illegal for him to supply cyanide of potassium or bichloride of mercury for photographic or any other purpose. We are quite aware that some dealers in photographic materials do sell them, but in doing so they contravene the Poisons Act, thereby rendering themselves liable to a penalty. Hence you will see that you are not misinformed, and the risk you incur.

HALLAM.—It is quite possible that some London houses are lax in the way in which they execute orders. But their customers have a very simple remedy in their hands, namely, to transfer their orders elsewhere. What good would arise from the publication of your letter? It would be of little, if any, interest to the readers, and would not remedy what you term a "growing evil." *Anonymous* letters on such subjects are not reputable.

KALIUM.—The electric light in the studio is equally as applicable to copying as to portraits. As a matter of fact, by far the larger proportion of the negatives for typographic blocks are made by artificial light during the winter months, the electric light being the illuminant employed. If you have the electric light in your town, you will find it more economical to obtain the current from the mains, for whichever purpose you require it, than to instal plant for its generation.

S. B. A.—In this column it is impossible to give the working details of the collodion process. We must refer you to some of the old manuals of photography, as well as to the innumerable detailed articles on the subject which have appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY and its ALMANAC. We may mention, however, that you are under a misapprehension in surmising that, as you are so well versed in the use of dry plates, you have not much to learn for wet. The knowledge gained in the use of the former will avail but little in learning the wet-collodion process.

A. W. J.—1. Each of the formulæ given in the current ALMANAC for orthochromatising plates answers well. Some brands of plates, with them, answer better for some subjects than others. A few experiments with two or three different brands will soon show which will answer the purpose best. The class of subject you propose to deal with is an exceedingly difficult one, and, to ensure success, a few tentative experiments may well be expended.

A. T. says: "I have been trying the ferrous-oxalate developer for plates, as I am told it is used almost exclusively on the Continent. But all my negatives with it have a faint whitewashed or milky appearance when dry. Is this the general appearance of negatives developed with iron, or is it something in my manipulations?"—The opalescence is caused by lime in the water forming oxalate of lime. It can be removed by treating the negatives with very dilute hydrochloric acid. A few drops to the ounce of water will suffice.

PICKWICK.—Some wall-papers form a very good background, but of course the patterns must be very unobtrusive and subdued, or, at least, show as such in the photograph. Plain papers known as "grounds"—that is, paper with the ground upon it before the pattern is printed—if of a suitable, tint and neatly hung, forms an excellent plain background. In this case the paper should be hung horizontally instead of vertically, beginning at the upper part first. Any paperhanger will do the work in this way if so instructed.

C. MATHESONS says, "I have several old silver spoons that are worn out; can I convert them into nitrate of silver?"—Nitrate of silver is made by dissolving the metal in diluted nitric acid, and then crystallising. But, as standard silver is alloyed with copper, nitrate of copper is also formed, so that from the spoons a mixture of nitrate of silver and nitrate of copper would be obtained. The copper can be got rid of; but, in the case of one having no chemical knowledge or appliances, the best way will be to sell the old metal to a refiner, and purchase nitrate of silver, or take it in exchange for the metal.

J. H. MARTIN writes as follows: "I have in my possession a negative of a part of the town taken twenty-five years ago, and my father (now deceased) lent it to a friend conditionally that he kept it to himself and made no show of it. He has an enlargement of it in his shop, and I hear he has also made some lantern plates from it. If I have the negative registered, can I stop him from exhibiting the enlargement? He promised at the time that he would not exhibit it, and it is my desire to prevent him doing so, as I, having the original, think I am justified in doing."—If the negative was lent under the conditions stated, it is a mean action of the borrower to make use of it contrary to them. Under the circumstances, we fear you have no legal remedy.

PERPLEXED writes: "I enclose a print, round the edge of the vignette of which you will discern some small white spots, that have come out on it after mounting. It was toned in a tungstate of soda bath, fixed in a one-to-five solution of hypo for fifteen minutes, put through a salt solution to prevent blistering, washed sixteen hours in running water, and mounted with Glenfield starch, at which time they did not show on the print, but in a day or two afterwards two or three prints out of each batch were similarly spotted, and I have not been able as yet to trace any on prints of the same batch which were unmounted. I shall be very pleased if you will kindly give me your idea as to what you think would cause such spots."—As only a few prints out of each batch became spotty, the cause would seem to be something in the manipulation. If all became equally effected, then the mounts or mountant might be suspected. Of course it would be impossible to hazard an opinion as to what, in the working, is the origin of the spots, on the data given.

"WATER" says: "We should esteem it a favour if you could let us know how to get out of a muddle we are in with washing our prints. We will explain matters. This last two days the water has become very milky, although after standing a short time it clears and settles on the edges of the washer in minute air-bells, the milkiness really being due to the air-bells. We are using a Wood's 12×10 washer, and as soon as the prints start washing the air-bells settle all over the faces of the prints like scum, and they will not go round in the washer in the usual way, but stop where the water comes in, the consequence being that they blister frightfully, and, of course, get very much injured. Could you tell us of anything that would do away with the air-bells in the water, as that is really the cause of the muddle, the water being so full of air-bells that the prints are not heavy enough to sink in the water? We may add that we are supplied direct from the main."—Water supplied at high pressure is often charged with air, and this is clearly the case in the present instance. The remedy is not to use the water direct from the main, but to receive it in a receptacle where it can rest for a few hours, so that the air can have time to escape. Have a cistern put up to receive the water, and draw from that.

F. H. asks: "Can you kindly inform me the reason of my toning bath turning brown after it has been used about three times? There is also a difficulty in getting it to tone after it turns brown, as if there were no more gold remaining. The bath I use is chloride of gold, thirty grains; acetate of soda, one ounce; and four drops of saturated solution of carbonate of soda; water, sixty ounces. I never had any trouble with the bath until I used ready-sensitised paper. Will you kindly give me a formula for blue tones on albumenised paper?"—The reason why the toning solution turned brown is that something has been introduced into it that has caused a reduction of the gold. When the gold is reduced, of course there is none left to tone with. Some papers seem to introduce foreign matters into the toning bath; when this is the case, only sufficient solution should be prepared at a time to tone the number of prints to be dealt with. We do not approve of the system of making a strong solution as in the formula quoted, and using it direct for toning time after time. A better way is to make up the solution with, say, half the quantity of water, and keep it as a stock solution; then, when any is required for use, take sufficient of it to tone the prints in hand, allowing, say, a grain of gold to a sheet of paper, and dilute with water. After use, this may be kept, and more of the stock solution added when more prints have to be toned. A formula for blue tones is given in the ALMANAC.

LENS.—The lens being a doublet of somewhat ancient construction, and not by a first-class maker, we question much if any advantage will be gained by enlarging the opening in the fixed diaphragm, unless you will be satisfied with impaired definition.

PHOTOGRAPHIC CLUB.—October 12, Members' Open Night. 19, Demonstration with the Platinotype Company's Magnesium Lamp.

LIVERPOOL CAMERA CLUB.—October 26, *Ilford Printing-out Paper, and the Methods in Use to Obtain the Best Results*, by Mr. W. A. Brown.

THE Salon Club, which has now been in existence twenty-six years, will commence its monthly dinners for the season at the Café Royal, Regent-street, on Monday next, October 10.

IN the *English Illustrated Magazine* for October, there is an illustrated article on "A Summer Among the Dovecots." Mr. Alfred Watkins, of Hereford, is the author, and the illustrations are from his photographs.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—October 13, *Practical Demonstration of Retouching*, Mr. Redmond Barrett. 20, First Lantern Night of the season, and Judgment of Competition Slides. 27, Members' Open Night.

MESSRS. GILMER BROS., the sole representatives of Messrs. Clement & Gilmer, of Paris, have removed from Victoria-buildings, Temple-row, Birmingham, to more spacious premises at Manchester-buildings, Cannon-street, Birmingham.

LEYTONSTONE CAMERA CLUB.—October 15, Lecturette, *Hand Cameras*, by Mr. D. G. Riddick. 22, Lecturette. *Stereoscopic Photography with a Single Camera*, by Mr. A. P. Wire. 29, Members' Lantern Evening. To commence at eight o'clock.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—October 17, *A Chat about Eastman Products*, led off by Mr. Baldwin. November 7, testing of competition slides. 21, *The Pleasures of Photography in the Study and the Field*, by Mr. C. Eldridge.

THE following gentlemen have kindly consented to act as Judges at the South London Photographic Society's Exhibition, to be held on November 24–26, 1892, at the Peckham Public Hall, Messrs. F. P. Cembrano, jun., A. Pringle, and L. Warnerke.

MISS CATHERINE WEED BARNES informs us that in future the business of the *American Amateur Photographer* and *Outing* will be conducted under the style of the American Photographic Publishing Company. Dr. J. H. Worman is President, Miss Barnes Vice-President, and Mr. F. C. Beach Secretary.

NORTH SURREY PHOTOGRAPHIC SOCIETY.—The following are the officers of this Society:—*President:* Mr. J. Morrish.—*Vice-President:* Mr. Lewis Wolff.—*Committee:* Messrs. F. Chambers, J. G. Dalzell, T. J. Bright, J. Larcombe, H. Senier, F. Fitzpane.—*Hon. Secretary* and *Treasurer:* Mr. R. W. Wilson, 42, Norwood-road, S.E. Meetings first and third Tuesdays in each month at 369, Norwood-road, S.E.

THE Hackney Photographic Society will hold its Annual Exhibition and Competition at the Morley Hall, Triangle, Hackney, N.E., Tuesday, Wednesday, and Thursday, November 15, 16, and 17, 1892. Apparatus by all the leading photographic firms will be shown, together with novelties and improvements, and demonstrations of the working of the various processes. The judges in the competition will be Captain W. de W. Abney, C.B., R.E., F.R.S., F.C.S., &c., Colonel J. Gale, and Mr. Ralph W. Robinson. Captain Abney will present the prizes.

"THE Life and Work of Professor Hubert Herkomer, R.A.," will this year form the subject of the *Art Annual* or Christmas Number of the *Art Journal*. The artist, in addition to placing a large quantity of material and illustrations at the publishers' disposal, has himself contributed a full-page original etching. In addition to a photogravure plate of *The Last Muster*, there will be illustrations of the artist's principal pictures, *Pressing to the West*, *Chapel of the Charterhouse*, *Found*, *Our Village*, *On Strike*, &c., also of his well-known portraits of *Miss Grant*, *The Lady in Black* (*Entranced*), *Archibald Forbes*, *Dean Liddell*, &c., together with views of the new house and specimens of the architecture and decoration, which are all being carried out from Professor Herkomer's own plans and designs, and executed under his personal superintendence.

FORTHCOMING EXHIBITIONS.

October 11-13.....	Bedford and District Amateur Photographic Society.
,, 17	Camera Club.
November 10-12...	*Leytonstone Camera Club.
,, 15-17...	*Hackney Photographic Society.
(Date not fixed)	Exeter Amateur Photographic Society.
November 17-19...	Brixton and Clapham Camera Club.
	North Middlesex Photographic Society.
,, 24-26...	South London Photographic Society.

* Signifies that there are open classes.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1693. Vol. XXXIX.—OCTOBER 14, 1892.

ARCHITECTURAL DISTORTION BY THE HAND CAMERA.

When, a few days ago, a friend called and submitted a large collection of views, mostly taken in Antwerp and Bruges with a hand camera, he said that he desired to produce lantern slides from them, but encountered a difficulty, arising from the fact of the camera not always having been held quite level. This, as every intelligent photographer is now well aware, produces a want of parallelism in the lines of a building, a topic we have treated on more than one occasion.

To see the perpendicular lines of a building converge is even more offensive than when such lines are curved. But there are circumstances under which, as in the instance cited above, it is not easy to avoid such a fault. Who that has in front of him a tall edifice, which he is desirous of obtaining, but must wish to have it complete from top of spire to basement? But, unfortunately, hand cameras—so few of which possess either rising fronts or swing backs—do not lend themselves to obtaining a building in this way; hence the pointing of them upwards becomes a species of necessity, notwithstanding the certainty of convergence of the perpendiculars.

In one of our Almanacs of a few years ago the method of obviating this was pointed out. It is not by any means difficult to produce a quite undistorted negative from an original that is replete with distortion of every kind; but it is a still easier procedure to print correct lantern slides from such a negative, and, as the lantern season is now on, a few hints relative to this will probably prove useful to many.

We must presuppose that, when lantern transparencies are to be produced from distorted negatives, it is indispensable that they be made by a camera. Superposition will not do in this case, as it only serves to perpetuate the defect. It is also of importance that the lens to be employed for this purpose be one of short focus. One that we have employed in this way has a solar focus of three and a half inches, which represents an effective working focus of seven inches when copying a thing the size of the original.

A very pronounced degree of converging distortion, such as we found in a negative of the Antwerp Cathedral of Notre Dame, cannot so easily be cured when a lens of long focus is employed, because with a swing back in the copying camera the amount of the swing is frequently insufficient. It is now only necessary that, when the negative is erected at one end or in front of the camera, the back has to be swung to such an extent as to cause the convergent lines of the original to appear quite parallel.

To prevent any blurriness which would arise from the top plane of the plate being proportionately farther away from the negative than the bottom, a very small stop must be employed during the exposure.

When once the camera is adjusted for one of a series of quarter-plates, or whatever other size those of the hand camera may be, there is no occasion to disturb such adjustment until the whole series has been printed. All that is needed is to look upon the focussing screen after each operation to make sure that just the right amount of tilting the screen has been given, for some negatives may be very much less distorted than others.

PRINTS *VERSUS* PROCESSES.

The present Exhibition at Pall Mall is pregnant with examples of the varieties of effect that may be produced by the selection of different printing processes. The prints of to-day, as there displayed, for variety of effect and artistic feeling, offer a conspicuous contrast to those of only a decade ago. The art side of photography has been the gainer, but who shall say what will be the verdict ten or twenty years hence? If the Council of the Society had the power of compulsory purchase of all pictures gaining medals, especially with new modes of working, and would act upon it regularly, hanging or preserving the prints in a suitable way for ascertaining the extent of their power to withstand the effects of time under ordinary conditions of storage, an exceedingly valuable collection of data for forming a judgment on the merits of the varieties of processes, as they become popular or otherwise, would be always available. As things now stand, the question of fugacity never arises with regard to medalling pictures at the Exhibition; and the photographic public generally give no particular heed to it. The researches of Messrs. Davanne and Girard, of more than a quarter of a century ago, dealing with the causes of fading of prints by then-known processes, are still the most complete and scientific elucidation yet published of the chemical changes undergone by a print during the chemical operations it passes through, subsequent to the production of the image in the printing frame. No new lines of investigation have been indicated, and, more important still, the plain lessons to be taught by these able investigators' experiments are frequently ignored, and a manner of working in direct opposition to them is by no means seldom adopted. Not by any means should experiments in novel directions be discountenanced; but, at the least, they should be guided by judgment and directed by knowledge of ascertained facts. Some of the effects to be obtained do not necessarily touch the question of permanency; thus we have prints matt and prints glazed; prints very smooth and prints very rough; prints on white, prints on coloured paper, none of which varieties of appearance have any necessary connexion

with the permanency or otherwise of a print. Nevertheless, some of these particular effects are bounded by the lines of processes where a very important question of permanency or fugacity arises.

We are led to pen these remarks by a suggestion recently made to us by Miss Weed Barnes in the course of a conversation upon exhibitions. It was to the effect that a very desirable feature would be a collection of a variety of prints by as many different processes as possible, from one and the same negative. Both photographers and the public generally might be taught an interesting lesson from such a set of photographs. We are aware that before now prints executed in different styles from a single plate have been exhibited; but the suggestion under consideration is that the set should be a representative one, including not merely two or three pleasing varieties, but as large a number as possible. Mechanical processes might be excluded, seeing that few photographers possess a knowledge and working skill with "process work" as well as ordinary chemical methods; but, apart from these, such a collection should be exhaustive, and include silver, carbon, iron, uranium, &c., developed prints and so on, and each in all its manifold varieties of colour, texture, and surface. We were quite in sympathy with the idea, but felt strongly that it should be enlarged upon. Thus all practical workers know that a certain class of negative is far better adapted than another for producing the best results of a particular process; one style of printing will suit almost any negative, another will be best exemplified when the prints are brought to a special hue or "tone." Some modes of printing can be best carried out from a weak and others from a strong negative; there are few in which the character of a negative is matter of indifference. The suggestion, elaborated as above, therefore would assume the form of a series of pictures by as many known processes as possible from each negative of a set of at least three negatives —dense, thin, average as to depth.

Our opinion is that, if the Photographic Society of Great Britain would offer as a subject for a medal a class embracing the best set of prints from three or more negatives of different depths of density, the prints to be done by as many different processes as possible—the size might be kept down to avoid burdening the wall-space—there would be many competitors, and the result, as encouraging more especially the scientific side of photography, would be equally interesting and popular, and to the careful observer in the highest degree instructive.

In close relation to this subject, and since penning the foregoing remarks, we understand that the Photographic Society has decided to purchase a selection of the photographs shown at its various Exhibitions, commencing with that now open. Not only should this collection form, in future years, a clear reference guide to technical and artistic progress in photography, but it should constitute an instructive, and, at the same time, officially provided, object-lesson in the comparative stability of the different methods of printing employed from time to time.

RESTORING FADED ALBUMEN PRINTS.*

Before resorting to further treatment of the print, it will be well to prepare it for the uniform absorption of the solutions, and also to remove any mechanical dirt that may have become attached to its surface in the course of time. For the latter purpose the best plan will be to sponge it gently with warm soap and water, and, if the operation be performed before removing the print from its mount, there will be less danger of injuring the surface or laying the foundation for future irregularity of action. A copious washing should, of course, follow the soap treatment.

The process of unmounting is frequently a tedious one, especially with prints of any considerable age, and more particularly still if the mountant has been of a gelatinous character. The tendency on the part of the print to adhere tenaciously in some parts, while others leave the mount with perfect ease, is very remarkable, and seems to point to some chemical change in the mountant in the direction of insolubility. In all cases, then, we recommend a preliminary soaking of the picture for some hours in cold water before attempting to separate the print from the mount. This will have the effect of softening the latter, which may then be stripped away in layers, leaving only the final one in immediate contact with the photograph, to be removed by a final treatment with *hot* water. But, even if this amount of care be exercised, the separation is still often a matter of some difficulty, and great care has to be exercised to avoid tearing one or other of the surfaces.

Though, of course, damage to the surface layer of the mount is of comparatively little importance, it is better to avoid even that, if possible, for, in addition to the difficulty there is in deciding with certainty which of the surfaces is tearing, any small fragments of the mount that may remain attached to the photograph will require removal by scraping or friction of some sort, which alone presents a chance of damaging the print, so far as its paper support is concerned, and it is in every way desirable that this should remain intact. The only safe course is to allow plenty of time, and to use water at a high—even boiling—temperature. There need be no scruples in doing this on the score of spoiling the tone of the photograph or otherwise injuring it, beyond a slight chance perhaps, with highly albumenised papers, of blistering or separation of the albumen surface; this, however, is a somewhat rare occurrence, and one that will cause little inconvenience if the blisters are not broken.

If the mount should prove still refractory, the print may be soaked for a short time in very dilute hydrochloric acid—about one part to twenty of water—at the ordinary temperature; this treatment we have never found to fail, and, if it exercises any effect beyond the softening of the mountant, it is of a beneficial character rather than otherwise, for, by also softening the size of the print, it tends to promote uniformity in the subsequent action of the solutions, while it may also help to remove any discolouration due simply to deterioration of the paper. On no account should alkaline solutions be employed, on account of their injurious action upon the albumen surface, and even in applying soap, as first recommended, it should be of the best and mildest quality.

Having successfully removed the print from its mount, if such treatment has not been already resorted to, it is desirable to immerse it for a few minutes in very hot water, after which it should be laid albumen side downwards upon a sheet of glass, and the back gently sponged to remove every trace of the old mountant and any minute particles of the mount that may have escaped previous notice. These precautions may be deemed exaggerated, but their neglect may be the means of causing spots, "mealiness," or other irregularities in the subse-

* Concluded from page 627.

quent chemical processes; and, as their adoption adds little to the trouble involved, it is worth while to do the thing properly. The acid bath may be used also if thought proper, either by itself or in conjunction with the sponging, but the free acid in the bleaching solution will perform all that is necessary if the print be otherwise carefully prepared.

We may just add, that the complete success of the restoring process depends rather upon the proper performance of these "minor" operations than upon the chemical reactions that follow, and this is one reason for laying such stress upon them, and upon thorough washing between bleaching, redevelopment, and toning. By thorough washing we do not mean necessarily prolonged soaking, for the intelligent use of a roller squeegee or similar appliance will prove more effective than the most protracted soaking can possibly do.

The bleaching solution which we recommend above all others is one composed of bichromate of potash, common salt, and a mere trace of hydrochloric acid. The latter addition is not absolutely necessary, but it materially hastens the work, and appears to otherwise act beneficially. The precise formula is immaterial, but the following answers well, and may act as a guide:—

Bichromate of potash	1 ounce.
Chloride of sodium	1 ,,
Hydrochloric acid	2 drachms.
Water	30 ounces.

The energy of the solution depends chiefly upon the free acid and salt, and, when its action becomes slow after treating a number of prints, fresh additions of these ingredients will restore it to its former vigour.

The prints to be restored are immersed bodily in this solution, when the image will be seen to rapidly fade or disappear. It is seldom that the most protracted immersion of a gold-toned print will render the image completely invisible owing to the gold that is present in it, and the appearance of the print before treatment must serve as the chief guide as to when it is sufficiently bleached, the stronger and blacker the tone the deeper will be the colour of the image that remains in the bichromate solution, while with some of the faint brown and purple-toned prints there may be scarcely any trace left. The length of immersion is not, however, a matter of very great importance if only all signs of "fading" from sulphuration and all resemblance to an ordinary silver print be lost. So far as we have been able to ascertain, by treatment extending over some hours, the original image is not apparently affected by possible over-action of the bichromate; so it is, perhaps, the best way to give full time.

On removal from the bleaching solution the print will be found to be stained a bright yellow colour by the bichromate, but this is quickly discharged on immersion in water, disappearing from the back of the print, or the paper, first, and more slowly from the albumen film. Alternate immersions in warm water and treatment with a roller squeegee will remove every trace of bichromate in a few minutes, and nothing then remains but to redevelop. We may repeat here what was said in the first part of this article as to the necessity for performing this part of the work in a subdued light, as, if a strong light be permitted to act on the paper while it contains the chromic salt, the latter may be reduced, and so cause permanent discolouration, or, at least, a stain that will necessitate the use of sulphurous acid or similar bleaching agent.

For the restoration of the image there is a choice of variety of developers and methods of treatment, all, however, consisting in the conversion or reduction of the invisible chloride of silver that still forms the image. The selection must be made according to the character or tone required in the final image. If the neutral black, or cool, grey tones of platinum, gelatino-bromide, or printing-out chloride papers be preferred, nothing answers better than the ordinary development of a bromide positive with ferrous oxalate, though, in view of the trouble of removing the last traces of iron from the paper, many will prefer one or other of the various alkaline forms. We have ourselves obtained the best results of this class with amidol, using the standard formula issued by the manufacturer diluted with ten or twelve times its volume of water. If more or less warm tones are required, a much weaker solution is to be used, and the print exposed freely to light first. Under these circumstances, the development is almost identical as regards colour with that of Alpha paper, and the image so obtained may be toned with gold in the usual way, using, for preference, the gold and sulpho-cyanide bath, which, as in the case of gelatino-developed images, seems to answer better than the gold bath ordinarily used with albumen paper.

With very strongly toned prints—that is, those that have been made from dense negatives and toned to a rich black—we have succeeded in reproducing by development alone a great variety of so-called "photographic" tones in brown and purple, the original gold retaining at least a portion of its influence over the final tone; but obviously, in such cases, the development must be of the character to give a warm colour to the silver portion of the image, and we may add, that it is even then not an easy matter to get the desired tone with certainty.

The prints may be finished off in any desired style as regards surface by the different devices of drying and enamelling. Simply dried and mounted, they present the ordinary appearance of albumen prints with the surface slightly reduced by the treatment. Matt effects may be attained by squeegeeing on to ground glass, and any degree of glaze can be imparted by the usual methods of rolling, burnishing, or enamelling. When finished, we have no hesitation in saying that the result is quite equal to the original print, except, perhaps, in the case of those that have a tendency in the direction of weakness or "delicacy" to start with, for these undoubtedly become further impoverished. We have submitted portions of unfaded prints to the treatment, and the result has in some cases been indistinguishable from the untreated portions, while, in many cases, it is possible to actually improve the tone and character of an unsatisfactory image.

This is particularly the case with over-printed and heavy albumen prints, while we may remark, though it does not come strictly within the scope of this article, that, as a means of improving gelatino-bromide or chloride prints that have been spoilt in development, the process is of the greatest value, as these, from the greater quantity of silver they contain, afford far greater scope for the manipulator than albumen prints do. Thus the delicate grey and flat image may be redeveloped up to vigorous strength, and, *per contra*, a heavy print may be reduced and modified in its gradation.

A Photographic Society for Greenwich.—On Wednesday next, October 19, a meeting, under the presidency of Mr. E. W. Maunder, F.R.A.S., will be held at the Lecture Hall, Royal-hill, Greenwich, to consider the advisability of forming a photographic society for Greenwich. We understand that Mr. Haddon and several gentlemen connected with the Royal Observatory will support the

society if it is formed, which, looking at the admirable opening it has in such a scientifically inclined neighbourhood, we have no doubt will be the case.

Ruby Lamps at the Custom House.—By a new order of the Customs Board the officers are in future to be provided with electric search lamps of a special pattern when "rummaging" for contraband goods on board tank and other vessels carrying petroleum or explosives. The object of this is to avoid the possibility of an explosion while engaged in the work. The order also directs that ruby-coloured lights for the examination of imported cases of "photographic negatives" in a dark chamber are to be supplied. By "photographic negatives" we may surmise that undeveloped plates are meant. One would have thought that the Custom authorities would nowadays have sufficient knowledge of photography to know the difference between a negative and a sensitive plate. Be that as it may, it is to be hoped that some one with a better knowledge of the subject than the Board appear to have will be deputed to see that the ruby glass is of the proper non-actinic character, and that the dark chamber does not admit light.

Carbon Printing Abroad.—Last week reference was made to the fact that, in the earliest days of carbon printing, the exposed tissue was cemented to indiarubbered paper for development, and was afterwards transferred to its final support by the aid of benzol. Although this system has long since been superseded in this country by the use of the commercial temporary support, or, where a large number of copies are required for publication purposes, by making reversed negatives, and printing by single transfer, the old plan is still largely followed on the Continent. Some of the largest publishing houses there of the reproductions of works of fine art still adhere to the old method with indiarubber, notwithstanding the additional trouble and expense incurred. It is difficult to see why this should be the case, seeing that the same end can be obtained by so much simpler and less costly means. Those who still use the original system, we are told, aver that by it they can obtain better results than by any other. It must be admitted that most of the reproductions in carbon of paintings in the foreign galleries are very fine, but are they any better than those produced here by less complicated means—supposing, of course, that the negatives are equal in quality?

Photography as a Witness.—It has more than once been suggested in these columns that in the case of accidents a photograph of the surroundings, if taken immediately after the occurrence, would often serve to show the cause better than any other kind of evidence. The value and practicability of this was well exemplified at an inquest recently held. A servant while cleaning a window fell. No one saw the accident; but her employer, who happened to be an amateur photographer, before anything was disturbed, took a photograph of the window. This photograph showed the position of the sashes, the washleather, dusters, &c., on the sill, and satisfied the coroner that the girl was sitting outside at the time she fell, and was not leaning out from the inside. If the services of the local photographer were invoked by the police in the case of railway and other accidents or catastrophes, the photograph would generally prove the most reliable evidence. It is difficult for the most conscientious witness, some time afterwards, to describe the precise conditions existing at a time of intense excitement and consternation. The time will, no doubt, come when a photographer will be officially attached to every division of police. The subject should receive the consideration of the Home Office without delay.

The New Patent Taxes.—The new regulations with regard to patent fees came into operation on the 1st of this month, and they will prove a convenience to many holders of photographic patents. The advantages of not a few inventions are not fully recognised, or their value fully established, before the inventor has had at the end of the fourth year to pay a 10*l.* renewal fee or to lose his patent. These renewal fees, varying from 10*l.* to 20*l.*, unless a lump sum, in two instalments of 50*l.* or 100*l.*, was paid down, had to be paid; so that the cost of a patent for the full term of fourteen years was 154*l.* By the new regulation made under the late Government, the renewal fees are commencing at the end of the fourth year—5*l.*, increasing 1*l.* annually till the fourteenth year. Thus, instead of a patent costing, for Government fees, 154*l.*, it will now only cost 99*l.*, with the further advantage of smaller payments at the earlier periods. The costs of patents are being slowly reduced in this country, yet the revenue of the Patent Office is increasing. Prior to 1852 a patent for the United Kingdom cost about 400*l.* One had to be taken for England and Wales (150*l.*), one for Scotland (150*l.*), and one for Ireland (85*l.*). Afterwards the law was altered, and one patent sufficed for the whole of the United Kingdom, and the cost for the full term then came to 175*l.* In 1884, the fees were again reduced, and the opportunity afforded of paying them by yearly instalments, as just referred to, until they amounted to a total of 154*l.* Now they only amount to 99*l.* Considerable as is this reduction, the cost of an English patent is much greater than for most other countries, Germany excepted. The cost of an American patent, for example, for seventeen years is equivalent to only about 8*l.* 10*s.* However, English photographic patentees will be thankful even for small mercies.

THE CAMERA CLUB.

The Camera Club Invitation Exhibition will be formally opened by the President (Captain Abney) on the evening of Monday next, October 17, and it will remain open to Thursday, December 8. The Hanging Committee were Colonel Gale, Mr. H. P. Robinson, and Mr. George Davison, and the preparation of the catalogue has been entrusted to Mr. Maskell. During the autumn the premises of the Club have been redecorated.

Captain Abney, Messrs. Pringle and Burchett, Commander Gladstone, Rev. F. C. Lambert, and Messrs. W. Jerome Harrison and H. E. Armstrong, F.R.S., are to read papers in the course of the ensuing months, and a retouching class, under Mr. Redmond Barrett, is being organized.

We gather from the Club *Journal* that the entrance fee will be raised from one to five guineas on and after January 1, 1893.

JOTTINGS.

It is with deep sorrow that I find myself compelled to confirm the rumour of the death of Her Most Gracious Majesty Queen Anne. Consols remain steady. A second historical event of recent occurrence, and of perhaps hardly less moment than the melancholy demise of that sovereign, and of which an inscrutable Fate has ordained that I should be the means of communication to your many readers is that, after a sanguinary and protracted struggle, in which there was enormous loss in killed and wounded on both sides, the fair land of Holland has at length fallen into the hands of the Dutch. The peace of Europe is therefore assured. Item of historical information No. 3 on my list is that the Exhibition of the Photographic Society of Great Britain is as successful as its best friends could wish. All's well that ends well; but I do not hesitate to say that the powerful support which this Journal has given to the old Society during its recent crises has had not a little to do with assuring the undoubted *éclat* with which the present Exhibition has gone off. However, long life to you, "aged P.," as Mr. Wemwick would say.

In a bright and chatty little serio-comic publication emanating from Manchester, and called *Spy*, I find an editorial article with the heading "A Local Photographer and his Lady Clients." This appears upon perusal to be nothing more nor less than a charge of grossly outrageous behaviour on the part of the photographer towards his lady sitters, conduct for which it is also hinted the precious rascal has more than once been soundly thrashed by irate husbands. *Spy* calls the man a "foreign gentleman (?)," and says that he is one of the best known photographers in Manchester, while at the same time a partial threat is given to print his name. For the credit of an honourable profession, I hope that *Spy* will not stop at half-measures.

but, in the interests of photography and the public generally, will do its obvious duty in assisting to drive this man out of the good city of Manchester. Professional photography is, at the best, a calling of such a precarious nature, that it can ill afford to be further disadvantaged by the doings of such a being as he whom *Spy* describes as guilty of conduct which unfits him for any society but that of gaol-birds.

Among recent applications for patents, I observe one for a walking-stick camera stand. I cannot, of course, tell what the particular features of this invention are, but it is obvious that the scope for variety in such an idea is very much restricted; hence, while I hope that the would-be patentee has hit on a really novel and money-making form of camera stand, I cannot help wondering to myself how many years it is since I first handled a walking-stick stand (the name of whose maker or originator I have forgotten), which consisted of a number of ribs with angled surfaces, all fitting closely together, and when not in photographic use being secured at the top with an iron ring, thus forming a serviceable, if somewhat long and ponderous, walking-stick.

I must take exception to some of the chemistry of sulphite of soda as enunciated at a recent meeting of the Hackney Photographic Society. To begin with, it was stated that some sulphite of soda had been exposed to air, did not dissolve in water, and did not "prevent the stain" to the same degree as the fresh substance. I agree with the gentleman who said that the latter effect was due to the oxidation of the sulphite; but, as to the inference that "oxidised sulphite" does not dissolve in water as well as unaltered sulphite, I should like to point out that sulphate of soda, which the oxidised product is supposed to be, instead of being less soluble than the unchanged sulphite, is really just about twice as easily soluble as the last-named body. Again, "a member had developed a lantern plate with pyro and sulphite only," and "it was remarked that sulphite of soda is alkaline." Not necessarily, and not always; otherwise, how is it that pyro may be preserved with a plain solution of sulphite? It would not if it were alkaline. The sulphite I employ for this purpose is neutral, and that is the variety usually sold by the dealers, I fancy. By the way, has the particular variety of sulphite employed with amidol anything to do with the contradictory experiences which some workers with the new developer seem to be having as regards its keeping free from discolouration for a week or two? Possibly, if the sulphite were invariably acidified, the browning of the amidol solution of which complaint is made would not occur.

The correspondent who inquired whether the light from a coal or coke fire would be sufficient to fog either sensitive plates or paper, like so many others "who write to the papers," might have spared himself the trouble of putting such a question had he but reflected a little beforehand. The flame of a coal fire is practically identical in nature with either gas, candle, or oil-lamp flames, and as he could not, of course, be in any doubt as to the effects of these three flames upon sensitive surfaces, it is a little surprising that he should have supposed (as he evidently did) that a flame from burning coal could be ineffective. All the same, a red, flameless fire, either coal or coke, might possibly have no harmful effects in the developing room, since I assume that in that condition it would give off very little actinic light.

There is no gainsaying the enormous popularity which gelatino-chloride printing papers have achieved, especially among amateurs, in a remarkably short space of time; but the process is still open to considerable improvement in one important respect, that is, in securing regularity and uniformity of tone. At present the tones aimed at are not obtained with anything like the certainty of albumen prints. One characteristic of these papers—the blue *nuance* so commonly seen in the half-tones of the prints—is possibly due to some inherent property of the support, the enamel paper for the various commercial gelatino-chloride papers now in use all coming, I am told, from one source.

COSMOS.

THE OBJECT OF PHOTOGRAPHY.

[Photographic Club.]

HAVING been asked to open the discussion to-night, the above subject has been selected as being important, and as permitting considerable difference of opinion. Let me indicate at once the broad, liberal lines on which it seems to me the discussion should be pursued. As long as human beings are not created free and equal, although a certain well-known document says so, they will differ materially in their objects and their pursuit of them. Especially is this true of mental processes, among which, I claim, photography holds no mean place. The object which each worker has in view may, and often does, differ widely from that which he should pursue in order to obtain the greatest possible benefit, and in thus striking the keynote of my paper I hope to point out in some degree the ideal all camerists should keep in sight. We all know the great moral axiom that we best help ourselves by helping others; indeed, it cannot be otherwise, and this help can be given in many ways, only seen by those whose minds are trained to receptivity of all progressive movements. The human mind is an organ, a function, an intangible, incomprehensible force—what you will; but it is great or small, not only according to the impulse behind it, but the use we make of it. We may look at photography through a narrow or wide-angle lens, through the telescope or ordinary view; there is plenty of choice, all depends on the will of the individual worker. Those who are able to learn by everything teachable in the realms of mind and matter will find that in photography these two forces join hands with greater or less energy according to the object of each worker. Those will gain the most whose ideal is the highest, and, as in union there is strength, so photographic workers accomplish most when organized into societies, provided the standard is held high over men's heads and never lowered from fear of criticism, for any purely personal or selfish motive. What if any individual worker should come more prominently than another into the brilliant electric light of public opinion or approbation. Is that a reason for discouragement or lowering one's own flag? Rather should it be an impetus forward on the principle of the fairy in one of Jean Ingelow's stories. "Don't you know," she said, "that in Fairyland what you can do you may do?" The trouble is, we carry on the fight somewhat on the free-lance principle, and "each one for himself" does not advance the general standard of progress. If individual preference be on the high plane of real altruism, well and good; but, usually, the ordinary human being is more exercised in raising his own special average than the general one of humanity.

"WHAT CAN PHOTOGRAPHY DO TO ELEVATE THE GENERAL AVERAGE?"

Let us consider then what photography can do to elevate this general average. If nothing, it is worthless, but it can do much and it is worthy of thoughtful consideration.

The adage that "beauty is its own excuse for being" does not entirely cover photography. The latter adds to the cultivation of the beautiful, that of the useful. Thousands of feet below the earth's surface, as regards land and sea, has the keen eye of the lens revealed to us once hidden mysteries, and beyond the systems of worlds heretofore unknown has it opened limitless possibilities. What other art or science can claim so much? In the astronomical equipment of Harvard University, near Boston, is being set up the largest photographic lens ever made, to be electrically controlled in correspondence to the motion of the earth. The lens has a twenty-four inch aperture, and will be used on a fourteen by seventeen plate. The time is fast approaching when photography will be utilised in all the countless ramifications of human knowledge, and there is no use in artists or scientists denying what will soon be an undeniable fact. Even on the lowest plane of merely personal help to each individual worker, photography is a pursuit embodying in itself broad scope for cultivating the powers of the keenest brain. Much more is this increased when we take into consideration our fellow-workers. Every thought which finds effect in word or act is a stone dropped into the stream of human life whose widening circles touch and influence countless others.

THE OBJECT OF THE INDIVIDUAL WORKER.

Speaking of the individual worker, what is and what should be his object in this work? We know they are not always the same thing. He begins, we will say, because it is suggested to him as an amusement, and many never get any further. They can be left out of the question; but to those who once begin to make a study of the work and find it broaden into one field after another, filling one's utmost limit of mental effort, the interest grows more absorbing as they realise that however great may be their progress, they will never know all there is to be known. The object which at first is pleasure only in the sense of recreation, becomes then something far nobler as a

powerful factor in training, what we speak of so often, and comprehend so incompletely, the human intellect.

If we accept the object of photography as being a mental education, how can it best benefit us? In every study those gain most who come equipped for work by natural or acquired gifts. Perhaps no one faculty in photography is more quickly called into exercise, or more rapidly improves, than that of observation. As this grows keener, the eyes stimulate the brain to act, and in landscape work alone, a fuller, richer appreciation is daily given us of the world of nature. The shortest journey shows us what we might otherwise pass by unheeding, and extended travel sends us home benefited by a wealth of experiences which many of our fellow-travellers lose. We do not need to go on land and sea for such; often near our own doors we learn to see a constantly varying panorama of change. I do not believe that in any more efficient way can we be helped than by aiding this very faculty of observation, especially in the young, when it can be made a fixed habit.

Portraiture and its Objects.

Passing from the world of nature to that of man, we find that, although we are usually gifted with the same physical organs and general appearance, that such are capable of infinite variety when looked at from different standpoints. In portraiture, the object should be to truthfully and kindly represent the sitter's best aspect. We have in this to struggle against preconceived prejudices, as people always think they know for themselves what the old woman called her "congregation side," and it is well occasionally to see ourselves with others' eyes. Once in a portrait gallery I heard a lady say, looking at her proof, "I don't like it at all, but it looks just like me." Another time, the photographer said to me, "There's Mr. A. has been here four times this week to sit, and yet is not satisfied." Do we all know our best side? Every portrait photographer who properly knows his business, understands that the first grand requisite of success is to make the sitter feel at ease under far different circumstances from his usual ones. It would be well if this was more carefully considered and made a more striking feature in our studios, but it draws heavily on one's nerve force, and necessitates more of a strain than most operators are willing to endure, unless really in love with their work, which the majority are not. I have had occasion to see a good deal of the inside of a professional studio, and a day's observation of the different sitters gives an entertaining study of human nature. I have often thought it would pay to have a regular adviser or art director in the studio to advise sitters, men and women, for one is no wiser than the other, what to wear and how to wear it to obtain an effective picture. If the operator attempts this, he too often meets a sharp rebuff. The amateur, if he be willing to use time and patience, has often a great advantage over the professional in respect to this question of being at ease, as his work is done usually amid familiar surroundings. I undertook once to photograph an old artist friend, who would not assume any but the stiffest possible pose of the shoulders, until I placed a palette and brushes in his hand, when his whole attitude became at once perfectly easy, because natural. Figure studies, to one who has a taste for them, are the most fascinating and, at the same time, most trying and difficult branch of photography. There is always something to learn in it, and its difficulty is, to me, its greatest charm. What is easy presents no attractions.

The Uses of Photographic Societies.

Every worker is more or less influenced by others, therefore he best utilises his own efforts, and in his turn exerts influence, by joining, as before suggested, a photographic society. The ideal one has yet to be invented or evolved as the tribes of men increase in not merely technical knowledge, but common sense. As at present constituted, they form, in the main, excellent schools as regards practice for those workers already somewhat proficient, but should do more for the beginner than is the case. As managed here and in America, they vary greatly, and each might gain by adopting some of the others' methods. I differ from my compatriot, Dr. Mitchell, in his advocacy of the club system, believing in the work as a mental education, not as a mental recreation. One point generally lost sight of in such organizations, as soon as they become prosperous, is the great law of majorities—the greatest good of the greatest number. Few human beings are capable of self-abnegation under such circumstances, and when they are, it is often to meet criticism, if not opposition, on the part of those less disinterested than themselves. The true worker should, however, like the Alpine climber on the glacier, be so busy in cutting steps for his feet, that he cannot watch the progress of others, but must attend to his own. When comparative success is gained, then comes the danger common to success, believing the summit has been reached, than which there is no more fatal delusion. It is possible, in tracing out the various by-paths of photography, to make the pursuit in large measure a liberal education, and the widest culture can be used advantageously. I believe in a sound technical training in optics, chemistry, and mechanics, an elementary, if no more, art training, and a wide reading of the best general literature. Here is where so many photographers — more professionals, perhaps, than amateurs—fail to realise the importance of cultivated intelligence in what claims, and rightly so, to be ranked among the fine arts. One should also make a point of keeping in touch with all that is being said and done through the various photographic journals in different countries, not work on blindly in one's own little special pathway.

Photography an Adjunct to Mental Studies.

If the object of photography is to educate, that means liberalise, and for this a thousand ways are opened through literature, science, and art. Decrying the increase of illustrations by photography as injuring wood-engraving, for instance, is like the rebellion of hand-work as against machinery. The world does move if people will act as did some Indians once on the American prairies who attempted to stop a train by holding a long leather lariat across the track. The Indians suffered, not the train. Photography is a most important adjunct in nearly all mental studies, and will become more so as its facilities for work increase. Let each one, therefore, follow out his or her own salvation, grateful for criticism or praise, whichever best aids in keeping high the standard already indicated. Lenses, cameras, instruments of all kinds are only means to an end, discussions upon them and upon methods of work are only valuable as they conduce to the further elevation of photography itself.

I feel strongly on this subject, believing firmly that photography can be of such incalculable benefit to all who pursue it with singleness of purpose, or with a desire to help others. In this connexion let me heartily endorse and offer hearty co-operation to the affiliation scheme recently proposed by the Cheltenham Society. It is a move in the right direction, and deserves the endorsement of similar organizations, wherever located. While not criticising those who look at the object of photography from a different standpoint than my own, I merely place myself on record as regarding photography in the light of a vital, educational force; a responsibility, and not a plaything; a power which can be used in so many ways when seriously considered that I cannot but feel it a privilege to be numbered among its adherents. Time and conscience prevent my wearying you with a longer paper, and yet I feel the subject has been very inadequately treated, my only consolation being that, in presenting it to you, I am enabled to emphasise my strong interest in the work to which my time and energies are devoted.

Catharine Weed Barnes.

AMIDOL.

This new developer has come to stay. Such is, I venture to say, the opinion of all who have tried it, or, better still, used it for many negatives, and on various occasions, because the ability to pronounce upon the merits of an article simply by trying it, instead of using it, is given to few of us.

The writer has now, for several weeks, used amidol, and has developed over fifty half-plates in the same solution, but additions of amidol, sulphite of soda, and bromide have been made. It will now be explained how and why these additions were made, and it will also show how plastic the material is in the photographer's hands.

Upon writing Messrs. Fuerst Brothers at the earliest stage of all, the writer was informed they could not supply less than twenty-five one-ounce bottles of amidol. (It may be mentioned here that they will now either supply one ounce, or else give away a sample.) Well, after a good hunt round town, three-quarters of an ounce were obtained from a photographic dealer, in a bottle without any label or instructions, accompanied with the remark, "I don't think we shall keep it, as there is nothing like good old pyro." Upon further examination at home, the crystals looked very like hydroquinol, or a preparation of hydroquinone. Being anxious to try the material at once, a plate was exposed in the camera, *short*, *normal*, *and full* exposure being given on one half-plate, by the simple dodge of raising the shutter one-third, two-thirds, and full. Some of the amidol in the meantime was dissolving in three ounces of water; within twenty minutes this was dissolved, poured into a developing dish, and the plate placed in the same. Within a few seconds the three exposures became visible, and eventually the one that had received the shortest exposure was the most satisfactory negative, the fully exposed part being flat and greyed all over, and the normally exposed one being in a similar condition

upon looking at it, but by transmitted light it was seen that the fog or greyness in the shadows was very slight, and would not detract from it as a good dense printer. It may be well to say that the words slow, normal, and full, referred to the exposure needful to have produced a negative of good or full dense printing quality by a hydroquinone developer. The lesson learnt was, Give shorter exposures; which, being translated, meant, This is the developer for the winter days now rapidly approaching, and indicated that it was a most suitable developer for children's portraits and groups and other work in which a minimum of exposure had or has to be given. It may be interesting to mention here that (1) the exposures were made in a studio, (2) the lens was a rapid rectilinear, using the largest stop supplied by the maker, *f*-8, and that on that particular day five seconds was the normal exposure. The "short" portions had two and a half seconds, and the "full" portion seven and a half seconds. That is, half the normal exposure in one case, and half as much again as the normal in the other case.

Now to return to the developer. It soon changed colour, so a little sulphite of soda was added, and by the morning it had considerably cleared, and it is now pale sherry colour. The next day another plate was tried, and after fixing it was seen to be covered with a good many spots; upon examining the dish, it was observed that the sides were covered with fine sand-like crystals. Filter the developer immediately flashed through one's brain. This was done, and the next six half-plates developed came up clean, dense, and just right printing density.

The next day a sample bottle arrived, and with it instructions and proportions; as these will be with the amidol my readers may use I will not repeat the formula, beyond saying amidol is a complete developer by itself; but the addition of sulphite of soda supplies the alkali needed if many plates are to be developed in one solution, and also preserves the solution from the action of oxygen. The makers advise the addition of a bromide, if thought necessary, and it is astonishing what a quantity of bromide of potassium can be used without any perceptible slowing taking place, or even any apparent action.

To resume again. Ten ounces of developer was made up according to formula, and it worked neither better nor worse than the old developer made up by rule of thumb, as stated in the commencement, more of each chemical being added in the advised proportions, and the solution filtered each time after using. *This is very important*, as the crystals do not seem to deposit on the bottle, but remain in suspension.

Two experiments made resulted in failure.

To a hydroquinone developer amidol was added, and a plate developed—result, faint image, universal grey deposit, with a few spots. Next was tried starting the development in amidol, and transferring the plate to a hydroquinone developer—result, fair image, thin, but such a plentiful supply of black spots, evidently the crystals above mentioned, precipitated upon the plate, and thus causing greater density.

To those who have used eikonogen and hydroquinone together, or in separate baths as a developer, the reason will be apparent why the last two experiments were made.

In conclusion, amidol in solution should be on the shelves of every worker, even if not used regularly. It will be found most useful on those negatives that have received a short exposure, or those sitters who photograph with extremes of light and shade, as some rugged faces do, and these so often come on bad days, or after the best light has gone.

The solution now measures ten ounces, and although over fifty half-plates have been developed in it its power is still unexhausted. It may be amidol will turn out to be similar to a good acetate soda toning bath. Just add gold each time you tone, and it will, like Tennyson's brook, "go on for ever." ARCHER CLARKE.

TONING PLATINUM PRINTS WITH URANIUM.

[Camera Club Journal.]

I HAVE recently been working with the new cold-bath platinotype paper, and I find, as no doubt others have done, that many prints, although, as far as one could judge on taking them from the printing frame, the details were apparent, yet, on development, turned out to be under-printed. This, in passing, I may remark, is the only drawback I have discovered in the use of the new paper. The tones in prints rightly printed are admirable, and when brush development is used, the normal developer being mixed with an equal quantity of glycerine, the process of development is very much under control.

As platinotype paper is rather expensive, I thought I would try if the under-printed prints could be improved by uranium toning, and I made up the following solutions:—

A.

Uranium nitrate	10 grains.
Glacial acetic acid	1 drachm.
Water	to 5 ounces.

B.

Ferridcyanide of potassium	10 grains.
Glacial acetic acid	1 drachm.
Water	to 5 ounces.

For use, mix equal quantities of A and B. These solutions, unmixed will keep for an indefinite time, but, after mixing, very soon deteriorate.

The prints are developed and fixed in the usual way, and after they have been dried should be inserted, one by one, in the toning solution, and will then, *if all the iron has been properly fixed out*, tone to any colour, from a nice brown to a Bartolozzi red, according to the time they are left in the solution. In order to make sure of the absence of iron from the paper, it is desirable, when it is proposed to tone prints, to give them an extra bath of double-strength hydrochloric acid; the presence of iron is shown in the toning process by blue stains.

The colour in the prints, when obtained, appears to me to be permanent, but, as I have only recently commenced experiments, it is, of course, difficult at present to be certain as to this. It seems to me that this process could be applied to produce sepia prints, and thus avoid having to use the special paper supplied by the Platinotype Company. F. FITZPAYNE.

THE MANIPULATION OF CHLORIDE OF SILVER GELATINE PAPER.

[Birmingham Photographic Society.]

IN laying before you my method of manipulating chloride of silver gelatine paper, I make no pretentions to exhaustiveness or completeness, either as to the various ways in which the paper may be treated or of the various makes obtainable. Besides some that I made myself some years ago, the only brands I have used much are the Ilford, the Eastman, and the Birmingham Photographic Company's "Criterion," most of my prints being on the Ilford and the Birmingham paper. Although the general treatment of them is the same, they all have various characteristics, which require to be known. They differ from each other in the colour they assume in the printing, and they behave differently in the after-operations of toning and fixing. You will see that they are over-printed, certainly not more, if so much, as albumen prints, and in this particular they compare favourably with some of the older gelatine papers, which required such a depth of over-printing as to render it difficult and uncertain to print to a nicety on them. The loss of depth with these papers occurs mostly in the washing before toning, and they lose but little in the fixing. They lose less with the combined toning and fixing than with toning and fixing done separately. Gelatine chloride paper must be kept dry, as it is more susceptible to damp than albumen paper; if not kept dry, it will give patchy and uneven prints. If the printing is done out of doors, it will be advisable to have an indiarubber pad in the frame at the back of the paper, otherwise it is not necessary. After the printing comes the toning, and the formulæ for toning these papers are very numerous.

TONING AND FIXING WITH THE COMBINED BATH.

The toning and fixing operations may be conducted separately, or a combined toning and fixing bath may be used. The simple toning bath varies from the single sulphocyanide of ammonium and chloride of gold one to one of half a dozen chemicals, and some of the combined baths are stupendous mixtures, containing alum and lead salt abominations. Why they are out of place is because they decompose a portion of the hyposulphite of soda, and liberate a portion of the sulphurous acid and sulphur, which is held in combination. These will combine with the silver of the image, and form sulphide of silver, causing what is known as sulphuration, or sulphur toning, and prints so toned are liable to fade and discolour. I have here a series of eight prints toned and fixed in the combined bath. Four of them are on the Eastman paper, and four on the Birmingham Photographic Company's "Criterion" paper. Two of each sort of paper were treated in a bath containing—

Hyposulphite sodium	4 ounces.
Sulphocyanide ammonium	100 grains.
Phosphate sodium	60 "
Chloride gold	2 "
Water	16 ounces.

The other four were treated in a bath in which one hundred grains of borax replaced the phosphate of sodium, and you will see on inspection that there is no perceptible difference in tone.

All combined baths require an unfixed print or some scraps of silvered paper soaking in some hours before use. The one great recommendation of the combined bath is, of course, that it is much less trouble than toning and fixing separately, there is much less swilling and washing. The danger attending its use is that, when it has been in use some time, the fixation of the prints may be imperfect, and, although the gold may be exhausted, it will go on toning. Now, these conditions, imperfect fixation and sulphur toning, are precisely the conditions under which the print may be certain of a short life, and will result in the unmerited condemnation of paper and bath. I know of no reason why, if the bath be used fresh and with sufficiency of gold, the toning and fixing should not be complete and the prints be as permanent as if treated in any other way; but, if the bath is used too much, you get yellow-stained prints with the half-tones, a most unpleasant colour.

I have here some prints made on the Ilford paper more than twelve months ago, and treated in the combined bath. You will see that they are warm in tone, and the combined bath has in my hands given better results in this particular than separate toning. When using the combination bath, the colour is judged from the surface, not by looking through, and the prints dry perceptibly darker.

Toning Pure and Simple.

Coming now to toning pure and simple, the bath I have used mostly is the Ilford formula, viz.:—

Sulphocyanide ammonium	30	grains.
Chloride gold	2½	„
Water	16	„

When a tube of chloride of gold is broken it has to be made up into a solution of definite strength, and will usually be found to be decidedly acid. A small scraping of ordinary chalk, not French chalk, should be shaken up in it to counteract this acidity. The prints require washing in several changes of water before toning, and they should not be left soaking in the first two changes. On immersion in the toning bath the prints change more or less with various papers to a yellow colour. This soon passes away, being succeeded by a purplish brown, and the progress of the operation is judged by holding the print up against the light. At first the print appears of a reddish colour all over. The next stage the lighter half-tones become dark or black, followed by the middle tones, and when the red has almost disappeared from the deep shadows the toning is complete, the surface colour being of a peculiar bluish purple. A washing in two or three changes of water follows, and fixing in hyposulphite of sodium three or four ounces to the pint of water, a small bit of washing soda being dropped in to counteract possible acidity. The prints require a final washing of about two hours under the tap or in a pan of water changed many times. This toning bath, as you will see from these prints, gives dark tones, being what I might perhaps call a warm black. With this bath I have been unable to obtain the lighter or brown tones on any of these papers.

If the print is taken out while there is any considerable portion of red left in it, you have the shadows of a brown colour, but the lighter parts have toned completely to the warm black, and the result is an unevenly toned print, as in two I will pass round. With this bath, therefore, you have to tone completely, and it has the advantage that you can depend upon getting a very fair uniformity of colour in the prints. The bath will keep, and can be used for some time, but I prefer to use it not more than two or three times, adding, of course, more gold as required. It is recommended to use the old bath as part basis for a new one, but I prefer to make up a fresh one, having a weakness for new and clean baths. Most of the toning troubles with this paper will be found to arise from an insufficiency of gold, and we should be generous with the gold, remembering that the more gold the prints will take up the better it will be for their permanence. I have used the borax toning with the Ilford paper, and have obtained pleasing, warm tones with it, as seen from these prints. The proportion is ninety grains borax to sixteen ounces water; gold, two grains, more or less. Gelatine papers require careful handling, as the gelatine, when wet, is very soft and soluble. Advantage is taken of this softness, when wet, to squeegee it, as it is called, on to a surface of glass, or other suitable non-absorbent material. When dry, it is stripped off, and retains the impression, whether glazed or matt, of the surface on which it dried. All mine are, as you see, matt-surfaced, and are done on ground glass, and as there is sometimes a difficulty experienced in separating the print, or some portions of it, from the glass, I have thought it best to go into details.

How to Obtain Matt Surfaces.

In the first place, you must have the right sort of ground glass; the ordinary window description is of no use at all for the purpose, it is altogether too rough and coarse, and the prints will not separate readily, neither will it give the surface required. The sort to employ is such as is used for focussing screens in cameras. The first thing to be done is to make the glass thoroughly clean, and this I do with soap, soda, hot water, and a scrubbing-brush. I do not find acids ammonia, or suchlike, at all necessary. Give the glass a good, scrubbing on both sides, and then wash thoroughly under the tap, rubbing it all over both sides and edges so as not to leave any trace of soap or dirty water. Then dry off with a perfectly clean cloth. This done, it has to be rubbed over with French chalk on a piece of soft rag. Use plenty of the chalk and rub it well all over, but not hard enough to bruise the talc. If the chalk sticks on to any particular part and will not rub off, it is a patch of dirt, and is insufficiently washed. It is not necessary to wash the glass every time it is used; if it is kept clean and not finger-marked on the surface used, it only requires rubbing lightly over with the chalk. Another point, too, worth noting is that after the glass has been stripped from a few times the adhesiveness of the print is very much reduced. The first time of stripping, the hold on to the glass is so great that you feel sure something will happen, but after a few times the print comes away quite easily and altogether. The print may be squeegeed on to the glass direct from the washing water, or it may be dried first. I usually let mine dry, and lay them down on the glass some other convenient time. Taking a dry print, then, it is immersed in clean water till quite limp, which will be in a minute or two, but do not leave it soaking for a length of time. Having then lightly dusted off the French chalk with a clean, dry cloth, we brush over the surface of the print while under water with a camel's-hair brush to remove air-bubbles and any dirt there may be there, and lift out the print by two corners, bringing with it as much water as we can. Then we lay it down on the glass in such a manner as to cause the water to drive out the air from between, and finish with a few light strokes with a roller squeegee. When it is thoroughly dry, but not before, the point of a knife is inserted under a corner, and the print lifted from the glass.

Edwin Underwood.

PHOTOGRAPHIC INDUSTRIES.

Messrs. Newman & Guardia.

For several years past the name of "Newman" has been associated with the invention and production of several excellent shutters, sheaths, hand cameras, &c., which have enjoyed a large measure of popularity. Quite recently a reconstitution of the firm of which Mr. Newman is the accomplished chief has taken place, that gentleman having associated himself with Mr. J. Guardia, who, we believe, is hardly less expert in photo-mechanics than his partner. As is but natural in modern business enterprises, this new arrangement has led to increased activity in the production of the firm's specialities, and it is doubtless safe to prophecy that Messrs. Newman & Guardia will in the future not fail to occupy and maintain a position second to none in prominence in their own especial line of business.

On the occasion of a recent visit to the firm's business premises, we were pleased to note unmistakable signs of activity, something like forty hands, Mr. Guardia told us, being employed. Hand cameras and the firm's new patent changing backs in various stages of preparation met our gaze, and we were particularly interested at observing the excellence and conscientiousness of the work put into the wooden bodies of the cameras—a point, of course, which in the finished article would escape the attention of the purchaser. In the way of hand cameras, indeed, many movements of great combined simplicity and effectiveness were shown us, many of which are adapted to existing cameras of the firm's make, while others are doubtless to appear in future productions. These included a neat and effective self-capping arrangement, small rapid spring doors for disclosing the lens when one is ready to expose, and other convenient devices. The changing back for either films or plates (which are held in sheaths), both in the action of the lifter and in the removal of the plate to be exposed from the back to the front, ready for exposure, is remarkably simple and reliable.

In the production and fitting of the various parts of the firm's shutters, hand cameras, changing backs, &c., a considerable quantity of ingenious machinery is, of course, employed, and all this, we believe, has either been adapted by Mr. Newman himself or laid down under his personal superintendence; that gentleman also exerting a like degree of supervision over the practical part of the business. Altogether, among

modern photographic businesses, Messrs. Newman & Guardia's fills an excellent position with the best anticipations of considerable expansion.

One of the firm's most recent introductions is the "N. & G." aluminium blind shutter, which is fitted with pneumatic regulation release and stopping gear. Besides witnessing the fitting together of the shutters' various parts, Mr. Guardia showed us a collection of the latter, and it was as surprising as it was agreeable to us to note with what accuracy, finish, and delicacy those parts had been made. A further point deserving of notice is that the parts are interchangeable, so that the replacement of any one of them is effected with the utmost ease.

This interchangeability applies to the blind, which is of a specially prepared material; while most of the parts of the shutter are of aluminium, brass only being used to a small extent and that alone where imperative. The lightness of the aluminium inner rollers and other parts is remarkable.

In action, the lever, as shown in the cut, is pulled up, and the index hand set to the exposure required, as marked on the dial at the side, the release being made in the ordinary way. In working, the absence of jar or vibration is very noticeable—this being due, of course, to the air cushion at the bottom of the cylinder. It is claimed that this gives the working parts an immunity from wear and tear, and we should think that practice would well justify such a claim. The shutter may also be used for time exposures, the figures on the dial marking exposures for from one second down to a fiftieth. It may be fitted at the back of the lens, on the hood or front, or between the lenses. Mr. Newman informed us that the system of testing the rapidity of the shutter ensures great accuracy.

Light, well made, neat, simple, and scientifically thought out, the "N. & G." shutter is a veritable photographic luxury and, at the same time, undoubtedly a useful one. We predict great popularity for it.

MR. F. HOLLYER'S EXHIBITION OF PLATINOTYPE REPRODUCTIONS.

At the Dudley Gallery, Piccadilly, Mr. F. Hollyer has gathered together considerably over 200 of his platinotype reproductions of pictures by ancient and modern masters, and a few present-day artists who aspire to attain the latter rank. Both as examples of the elasticity of power which photography has in reproducing in monochrome the relative tone values, the predominant effects of lighting, atmosphere, and of course the subtleties in composition of a painter's work, as well as an attestation of the remarkable suitability of the platinum-printing process for the purpose, Mr. Hollyer's Exhibition is especially interesting to photographers.

Of this "picture copier of the first class" as Mr. H. P. Robinson, with somewhat scanty justice, thought fit to call Mr. Hollyer, Mr. Horace Townsend has the following remarks in the catalogue to the pictures:—

"In these days of overabundant art slang and studio jargon it is difficult to define simply, satisfactorily, and yet convincingly, an artistic position; but it seems at least plausible to advance the thesis that the elevation of picture-copying from a mechanical process to an artistic method necessitates the bestowal upon the reproduction of a portion of the reproducer's personality.

Here it is, I think, that Mr. Hollyer's work is in especial heedworthy, if not absolutely epoch-making as regards the history of photography.

To me at least, in the interesting series of reproductions he has for the first time brought together, there is abundant evidence that, apart from all questions of technical excellence, there is here to be found in each example, however widely differing may be the methods of the original creators, the strenuous note of his own individuality. In each case, however, this harmonises and makes no discord with the exemplar.

How this personal element can assert itself in defiance of the rigid bonds of what would appear to be so purely scientific or mechanical a process as copying a picture by photographic methods, is an inquiry perhaps as bootless as it would be involved and curious. Those, however, who are in a measure acquainted with the practical procedure of photography, and nowadays these are no few, may be reminded that there are three points at least in that procedure at which the artistic individuality of the operator may over-ride his mechanical limitations—namely, the focussing, the developing, and the manipulation of the printing from the negative.

The charge has, and not without foundation, been brought against Mr. Hollyer's reproductions that there is in them not only the original artist but a suggestion of Mr. Hollyer himself, and this in spite of the fact that there is absolutely no retouching of the negative. So far from looking upon this as a defect it seems to me to be the differentiating touch which elevates his work from a process into an art."

Of the pictures in which, to our thinking, Mr. Hollyer is most successful in reproducing, Moreland's *Stable*, Hobbema's *Avenue*, and the small collection from the recent Exhibition of the new English Art Club in the same room, deserve particular notice. The portrait *Study* of Prince Trouvetski is an especially happy example of the way in which Mr. Hollyer has preserved the lights and tones of the original. Among the miscellaneous collection are copies of works by Dawson, Rubens, Etty, Rosa Bonheur, Reynolds, Corot, da Vinci, Raphael, Velasquez, &c. There are eighteen copies of Rossetti's pictures, many of which are familiar to the students of the contents of printsellers' windows; sixty of Burne Jones's; forty-five miscellaneous subjects by G. F. Watts, together with thirty-eight of the latter artist's well-known portraits, and many other subjects. In few if any of these reproductions has Mr. Hollyer failed to prove that, as a master of photographic *technique*, applied to copying purposes, he is *facile princeps*, while it is just as obvious that he is animated by the soundest artistic judgment. Mr. Hollyer's Exhibition should do much to popularise platinotype reproductions, in preference to the almost too-prevalent cheap photogravures and etchings of well-known pictures.

EXTRACT FROM THE DAILY PRESS ON THE PHOTOGRAPHIC EXHIBITION.

[*St. James's Gazette.*]

One photographic exhibition varies but little from its fellows, and as each successive one comes round the same expectations are aroused, and disappointments ensue; expectations aroused by the continuous energy displayed by manufacturers of apparatus, and by the public in making use of the same; disappointments caused by the slow advances apparent in the standard of production, and the still more tardy march of the professionals towards an artistic sense. At the Exhibition of the Photographic Society of Great Britain, now open in Pall Mall East, one would hope to find, if anywhere, improvements apparent in both of these. But this is not to any extent the case. There are, undoubtedly, many examples of mechanical achievements—enlargements which cover such areas that no single piece of paper is large enough to carry them, as ill-disguised joints testify; visions of the growth of such evanescent creations as clouds, of interest, beauty, and use; photographs printed on paper so as to convey the deception of being works painted by hand. But alongside of this there is much that is terrible to the artistic eye, and which, conceived with the idea that it is artistic, can only warrant its reception here to mastery over mechanical difficulties. Such are the unnatural *tableaux vivants*, the stagy interiors with ill-assorted figures, the portraits of nymphs, shepherdesses, and children mast-headed, which we may expect to find held up for admiration by the tout outside the shilling photographers' in the Euston-road, but not by the premier Society in England. In landscape and architecture, which admit of little posing, and which are, we imagine, principally the work of amateurs, the results are better. Attention in this departure may be directed to the works of Karl Greger; Colonel Gale; H. J. Godbold, whose *Rocket to the Rescue* is most interesting; B. Gay Wilkinson, who received a medal, but whose work appears to be lacking in detail (*vide*, *passim*, *Westminster*); W. R. Cassels, who portrays a delightful reminiscence of a Mentone valley; Henry

Little, with a remarkable bromide enlargement of the Vatican Library; U. French; Mrs. Main; and W. Thomas. Nor must the interesting and instructive series of lantern slides, illustrating *Bees and Bee-culture*, by T. E. Freshwater, be overlooked. It is said that the Society is at present disturbed by the action of a certain section of its members who are not satisfied with the quality of some of the work admitted to its Exhibitions. We are not surprised to hear this.

Our Editorial Table.

Photographic Chemicals.

By Messrs. Harrington Brothers, Cork.

This well-known firm of chemical manufactures have sent us samples of pure chemicals specially prepared by them for the use of photographers. Among these are sulphite of soda, oxalate of potash, acetate and carbonate of soda, and similar productions in every-day use. We have found them quite pure and good.

Messrs. Percy Lund & Co., of Bradford, have submitted to us a panoramic album for photographs, its distinctive feature being that the photographs do not require mounting, but may be placed in small slits made at the corners. It should prove useful for holding a series of small prints for carrying in the pocket, &c.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
October 17	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
„ 17	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
„ 17	Hastings and St. Leonards	
„ 17	Leeds (Technical)	Mechanics' Institute, Leeds.
„ 17	Richmond	Greyhound Hotel, Richmond.
„ 17	South London	Hanover Hall, Hanover-park, S.E.
„ 18	Exeter	College Hall, South-street, Exeter.
„ 18	Keighley and District	Mechanics' Institute, North-street.
„ 18	North London	Wellington Hall, Islington, N.
„ 18	Oxford Photo. Society	Society's Rooms, 136, High-street.
„ 18	Southport	Shaftesbury-buildings, Eastbank-st.
„ 19	Brechin	14, St. Mary-street, Brechin.
„ 19	Bury (Annual)	Temperance Hall, Bury.
„ 19	Hyde (Annual)	
„ 19	Manchester Camera Club	Victoria Hotel, Manchester.
„ 19	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
„ 19	Portsmouth	Y.M.C.A.-buildings, Landport.
„ 19	Southsea	
„ 19	West Surrey	St. Mark's Schools, Battersea-rise.
„ 20	Birmingham	Lecture Room, Midland Institute.
„ 20	Brixton and Clapham	Gresham Hall, Brixton.
„ 20	Camera Club	Charing-cross-road, W.C.
„ 20	Greenock	Museum Com. Room, Kelly-street.
„ 20	London and Provincial	Champion Hotel, 15, Aldersgate-st.
„ 20	Oldham	The Lyceum, Union-street, Oldham.
„ 21	Cardiff	
„ 21	Holborn	
„ 21	Leamington	Trinity Church Room, Morton-st.
„ 21	Maidstone	"The Palace," Maidstone.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

October 6,—Mr. Thomas Bedding in the chair.

Mr. E. J. Wall presented Eder's book on emulsion-making to the library. A letter from Miss C. W. Barnes was read, in which she expressed gratification at her recent election as an honorary member of the Association. It was stated that the display of members' slides at the Photographic Society's Exhibition would take place on the evening of Wednesday, November 7.

Old Wet-plate Negatives.

Mr. C. Goodwin Norton exhibited a collection of wet-collodion negatives taken in Portugal in the years 1858–63 with an ordinary achromatic meniscus lens of 12 inches focus, the stop used being a quarter of an inch in diameter. The apparatus was carried on the backs of two mules, water having to be fetched from a distance of four or five miles from where the exposures were made. The exposures averaged two minutes in bright sunshine, and the negatives were the work of a chief engineer on a railway, who chose photography as a means of sending home his weekly reports of the progress of the works. Mr. Norton said he would endeavour on a future occasion to bring up for comparison prints from the negatives made at the time, as well as others more recently made.

Prints from negatives taken of groups of the members assembled at Hampstead on October 1, by Messrs. Bridge and Weir Brown, were shown.

Mr. T. E. Freshwater passed round a collection of photographs illustrative of bee-culture, and described the circumstances under which they were taken.

Questions.

The following question from the box was read: "Does a gelatino-bromide plate improve during the first few days or weeks after manufacture?"

Mr. A. Cowan said that the keeping might harden the film, but he did not know of any other way in which the plates would improve. Plates, which were known to have a tendency to frill, when kept for six months had lost the property of frilling.

Mr. P. Everitt asked whether slow plates gave less gradation than rapid plates. Captain Abney stated that slow plates gave less range of gradation than rapid, but in his (Mr. Everitt's) experience it was rather the other way.

Question No. 2: "Does glycerine in gelatino-bromide plates interfere with their keeping or other good qualities?"

Mr. W. E. Debenham thought it would make plates hygroscopic.

Relative Rapidity of Development Printing Papers.

Mr. B. Foulkes-Winks exhibited a number of prints from an average negative (which he also showed) made to ascertain the relative rapidity of the commercial bromide and other development printing papers in use. A duplex oil lamp of sixteen candle power was the illuminant, the range of exposure given being from ten to sixty seconds at a distance of two feet. An iron developer was used in some cases. In other cases amidol (the results given by which were considered very successful), hydroquinone, and rodinal were used. These developers gave considerable variety of colour. Magnesium and gas were also used as illuminants. In reply to Mr. Teape, he said that ferrous oxalate gave him the best results, but the colour given by amidol was very pleasing.

Mr. Cowan and Mr. Everitt had noticed that amidol had a slight tendency to discolour the whites of a picture, and Mr. Cowan suggested that Mr. Foulkes-Winks should repeat the experiments with clean white margins to the prints, so as to show the staining or non-staining properties of the various developers used.

Mr. E. J. Wall, in reference to the rapidities of the various papers as arrived at by Mr. Foulkes-Winks, said that he had made some experiments with the same object, but with different results, using a graduated screen of a Warnerke's sensitometer, which he thought was better than using an ordinary negative and an oil lamp, at a distance of three feet. All the papers were exposed for a certain time, and the bromide papers were developed with fresh ferrous oxalate for each print. He developed up to the very last number he could get out, and by that means calculated the speeds.

The meeting subsequently adjourned.

North London Photographic Society.—October 4, 1892, Mr. R. Tanner in the chair.—This being the first Optical Lantern Night of the season, slides were exhibited by various members, some especially being of a very high order of merit. Among the slides shown were some exceedingly rapid hand-camera shots, taken by the "Frena" camera. Being so early in the season, the quantity of work was not large, many members having hardly begun slide printing yet. Next meeting, October 18. Technical Night and nomination of Council and Officers for the Annual Meeting on November 1.

North Middlesex Photographic Society.—October 10. The Presiden (Mr. J. W. Marshall) was in the chair, and between sixty and seventy members were present.—Col. J. Gale addressed the Society and illustrated his remarks with a selection of beautiful lantern slides. The views were drawn from all parts of the country, and illustrated many different phases of rustic life and employment, and varied atmospheric effect.—sunrise, sunset, mist, snow, hoarfrost, rain, and sunshine. Among the slides were included, by special request, a number which Col. Gale had shown on a previous occasion, noticeably *Abandoned*, *Through the Driftway to the Fold*, and a number of atmospheric effects on the Sussex downs. He then exhibited a fine selection of slides by his friends Mr. Bright and B. Gay Wilkinson. Mr. Wilkinson's slides were chiefly beautiful studies of rustic scenery, and Mr. Bright's were partly marine studies and partly humorous studies of children and animals. One, of a child sitting on the sands and glowering at the camerist, caused repeated peals of laughter. A most enjoyable evening was spent, and a vote of thanks was moved in suitable terms by Mr. F. Cherry, and seconded by Mr. H. Walker, who related how, when recently on a photographic tour in the Lake district, he came across a cottager who showed him, with evident pride, a photograph of her cottage which had been presented to her by Col. Gale. The next meeting will be held on the 24th inst., when an exhibition of members' slides will be given. Ladies are invited, and visitors will be welcome.

Hackney Photographic Society.—The weekly meeting held last Tuesday was an open night. Mr. Beckett presided. It was announced that Sir Albert Rollit, who is an amateur photographer, had consented to open the Exhibition on November 15 next at Morley Hall. A discussion on hand cameras was taken up. The Chairman thought more care should be used in the selection of a picture. The Secretary said that dust was more prevented when dark slides were used, and preferred their use to magazine kind. Mr. Gosling preferred magazine if it worked. The risible faculties of the members were tickled at this, many of whom doubtless had tried a magazine camera. Mr. Gosling went on to say he thought dust could be prevented causing damage to a great extent by painting the inside of the camera with glycerine. The Chairman said that sky printing was more neglected than it should be. Mr. Barker said he used a solution of bromide of potassium, applying it to the sky to prevent the action of developer there. Mr. Hudson then showed some prints on cellodine, a new printing-out paper not yet on the market. It was claimed that a print could be toned, fixed, and washed in hot water, and mounted (with permanence) in ten minutes. Mr. Pollard asked if solution of chloro-platinite would keep. Mr. Soneau said it would. The Chairman thought a good way to use amidol would be dry, as it is easy soluble.

Holborn Camera Club—October 7, Mr. E. H. Bayston in the chair.—Mr. J. H. Avery demonstrated the working of the Platinotype Company's new cold-bath process. He hoped to show that platinum printing by this method was one of the simplest of printing processes, and that the ordinary worker with

but little spare time, and limited space and appliances at his command, could work this process with advantage. In his opinion, while the results were far away in advance of most other printing processes, it was at the same time much more easy and pleasant to work. After further comparing platinum paper with other papers, he went on to speak of the working of the new paper, which he characterised as simplicity itself; no hypo baths required, no tedious washing, and they could develop the prints in their ordinary room by either weak daylight or gaslight. Mr. Avery thought the price had stopped the use of platinotype paper amongst some amateurs. Many thought it excessive, but, if they took into consideration the superior results and the small quantity of waste prints they had, he thought they would find it just as cheap as any other paper. Mr. Avery then went on to give various points in favour of the new cold-bath process over the hot-bath process. He developed a number of prints by this new process and the use and simplicity with which the paper could be worked commended itself to all present. On Saturday last, the final outing of the year took place at Westminster Abbey and the Houses of Parliament, finishing the evening with a tea and smoking concert at the club's headquarters.

Kensington and Bayswater Photographic Society.—October 10, Mr. J. E. Hodd presided.—The following gentlemen were elected officers for the coming year:—*President:* Hon. L. M. Sinclair.—*Council:* Messrs. Bursnell, Frogbrook, Hannaford, J. E. and R. A. Hodd, and Mote.—*Hon. Treasurer:* Mr. F. A. Hahn.—*Hon. Secretary:* Mr. C. W. Brumwell 7, Lower-terrace, Notting Hill, W. The funds of the Society were shown to be in a very satisfactory condition.

Richmond Camera Club.—October 7, Annual General Meeting.—The following officers for the ensuing year were elected:—*President:* Mr. F. P. Cembrano, jun.—*Committee:* Messrs. J. H. Alabaster, A. Ardaseer, C. H. Davis, A. Hunter, F. Neville, G. W. Ramsay.—*Hon. Secretary:* Mr. P. Ennis. The President announced that the Annual Dinner would be on November 28, at the Greyhound Hotel, and that the *conversazione* would be held at the Theatre Royal, on January 9, 1893. The annual report and balance-sheet were accepted. Beginning from October 10 the meetings will be held on Mondays instead of Fridays.

THE first meeting of the Winter Session took place on the 10th inst., it being also the first meeting under the new conditions, that is to say, held on Monday evening instead of Friday, and in the larger room, to secure the use of which has been the object of the change of day. The advantages of the new room were manifest, space, ventilation, lighting, and general comfort leaving nothing to be desired. Mr. Ennis read the paper by Mr. Dawson on "Photogravure," lent by the Photographic Society of Great Britain, and the subject was illustrated by a large number of choice prints lent by Mr. Ramsay, in addition to those supplied with the lecture. The paper was interesting, but the absence of the blackboard illustrations, to which frequent reference was made, rendered some portions of it less intelligible than might otherwise have been the case.

South London Photographic Society.—October 3, the President (Mr. F. W. Edwards) in the chair.—It was announced that the President intended to offer a prize for the best picture taken on Barnet plates, samples of which, by the courtesy of the makers, were distributed, the results to be judged on November 7. Some experiences of developing with amidol were given. It was found that the developer became inert and colourless if meta-bisulphite was substituted for sulphite of soda. One member found that used with hydroquinone it produced fog, while another member had mixed pyro with success. The further discussion of the subject was deferred until the next meeting.

Brixton and Clapham Camera Club.—October 4, first Open Lantern Night of the season.—The rain, which fell in torrents during the evening, somewhat spoiled the attendance, only seventeen members being present. Those, however, who had braved the elements were rewarded by seeing some very fine slides taken on a tour in the Scilly Isles and the Land's End by Messrs. H. and T. Bartrop and J. A. Butler, several of the sea pictures evoking great applause. Slides were also shown by Messrs. T. F. Buckle and A. Howard.

West Surrey Photographic Society.—October 5, the President (Lieutenant Colonel J. Gale) in the chair.—The PRESIDENT gave a short address, in which, alluding to the work of the Society, he drew an interesting parallel between the influence of photography and books. Referring to a recent address of Sir John Lubbock, Colonel Gale showed that most of the claims made for books in regard to mental education as well as amusement could be extended to photographs. The subject of the evening was an address by Mr. Davison touching upon a few practical points in regard to photographic apparatus used with an artistic purpose. This address proved a treat, the experience of such a worker as Mr. Davison proving invaluable in various ways to those present. Subsequently a few novelties in apparatus were shown and described to the meeting. These included a new hand camera about to be introduced by Messrs. Hinton & Co., the aluminium blind-shutter, and the changing back of Messrs. Newman & Guardia, and a new hand camera made by Mr. Hawkins.

West Kent Amateur Photographic Society.—October 7, Annual General Meeting, the President (Mr. Andrew Pringle) in the chair.—The officers for the ensuing year were elected as follows:—*President:* Mr. A. Pringle—*Vice-President:* Mr. A. R. Dresser—*Council:* Messrs. Jones, Court, Taylor, Nash, Clark, Wiseman, Grant, and Pickell.—*Hon. Secretary and Treasurer:* Mr. E. Hawkins. The accounts for the last year, audited by Messrs. Clark and Wiseman, were then presented to the President, and showed a substantial balance. A discussion then arose as to what should be done with the latter, as it was not thought necessary that the Society should go on accumulating funds of this manner. It was proposed that a *soirée* and exhibition of members' work with lantern show should be given, and carried unanimously. It was also proposed that it should be held in Sidcup Public Hall in the first week of December. A Committee was then appointed of Messrs. Pringle, Hawkins, Pickell, Taylor, and Clark, to carry out necessary arrangements and report at next meeting. Prints for competition to be sent to the Hon. Secretary not later than the day before the Exhibition framed, and no unframed prints will be exhibited. Slides to be delivered on or before meeting previous to *soirée*.

Croydon Microscopical and Natural History Club (Photographic Section).—October 7, Mr. Jno. Weir Brown in the chair, the subject being hand cameras and any apparatus which they (the members) may have used, and report on the merits and defects as shown in practice.—The Chairman called attention to the club *soirée* being held, as usual, November 23, and, being the twenty-third annual *soirée*, it was hoped that members would get forward their work so that the Committee would be able to display and hang it to the best advantage. Mr. W. Low Sarjeant was undertaking the management of the photographic section of the *soirée*, so that any information required could be obtained from him. Mr. Bynoe, Messrs. R. & J. Beck's representative, then kindly exhibited and demonstrated the use of their new "Frena" hand camera for films, taking 3¼×3¼, weighing complete three pounds. Mr. Tottem, Messrs. G. Houghton's representative, also kindly showed the working and uses of the "Shuttle" hand camera, which was adapted for plates and films, the quarter-plate weighing four and a quarter pounds with plates and three pounds with films. Mr. Low Sarjeant also exhibited two hand cameras. Messrs. Walker and Carter and several other members showed hand cameras.

Birmingham Photographic Society.—Mr. A. J. Leeson in the chair.—The Assistant Secretary read a letter he had received from the President (Sir J. B. Stone) and which was a reply to the congratulatory resolution adopted at the meeting of the Society held August 23. Two new members were elected, and one nominated for election. Mr. E. Underwood then delivered his paper on the *The Manipulation of Gelatino-chloride Paper*. [see p. 663.] Mr. Underwood, in addition to his paper, gave a demonstration which was of a thoroughly practical nature. The squeegeeing of the prints on to ground glass, stripping them off, &c., was illustrated and explained in such a remarkably explicit manner as to call forth the admiration and thanks of the members present. In the discussion which followed, in addition to the chairman (Mr. A. J. Leeson), Messrs. A. Jones, J. T. Mousley, J. H. Pickard, J. Simpkin, E. Winn, and others took part. This being the first meeting held in the new club room, the chairman announced "that the meetings at the Midland Institute would be discontinued. In future the whole of the meetings (with the exception, perhaps, of one or two large lantern displays) would be held in the new room. The old club-room, which is far too small for the requirements of the Society, will be used as a library and reading-room. The fact of all the meetings being held in one place would, he was sure, still further increase the attendance of the members, and add to the success of the Society."

Bolton Photographic Society.—In connexion with the Bolton Photographic Society, an exhibition of slides was given in the Spinners' Hall, St. George's-road, on Tuesday evening, October 5, by Mr. W. Banks, Corporation-street, the occasion marking the commencement of Society's gatherings to be held during the coming winter at their rooms in Rushton-street. The slides exhibited were the present season's by some of the largest firms of photographers in the country, such as York, Valentine, Wilson, &c., and also by members of the Society, and as each in turn was thrown on the canvas by the means of a powerful oxy-hydrogen light they proved to be a very artistic collection. Some views in Iceland were exceptionally good, as also were those of the Rocky Mountains. Other excellent views, taken on a yachting cruise round the coast of Scotland, came in for much admiration, whilst, for the edification of the younger portion of the audience, some diverting pictures were exhibited. Dr. Barr and Mr. J. S. Roscoe, members of the Society, lent a number of slides, dealing principally with local views.

Chorley Polytechnic Photographic Society.—October 5, the President (Mr. J. T. Brierley) in the chair.—It was decided to have, during the winter months, a series of demonstrations, lantern exhibitions, &c. It was also decided to have a Society album, and that each member of the Society will be expected to contribute his share of prints with a note as to plate exposure, development paper used, &c. Also Wednesday evening in each week was fixed upon as the special time when members would be expected to meet together for exchange of ideas, social chat, &c.

Lewes Photographic Society.—At the Monthly Meeting, October 4, Mr. J. Tunks (the President) gave a demonstration in making lantern slides, developing with amidol, which was followed by a discussion. It was announced that the quarterly certificate was taken by Mr. G. J. Wightman, with a landscape in platinotype.

Midland Camera Club.—Annual General Meeting, October 7, the President (Dr. Hall-Edwards) in the chair. The annual report showed that during the year fourteen general meetings had been held, with an average attendance of twenty-eight. The silver medal for the best excursion picture was awarded by the Judge, Mr. F. P. Cembrano, jun., to the late Hon. Secretary, Walter D. Welford, for a shot in the "Frena" hand camera. The present strength of the club is seventy-eight. The Council regretted that, owing to pressure of work, Mr. Welford would be unable to continue as Hon. Secretary. The Hon. Treasurer's statement showed a small balance to the good. Commenting upon these reports, the President considered that, though they might perhaps have done more, yet the work of the first year was eminently satisfactory. There were always difficulties in working a new club, members not knowing each other, a lack of interest, &c., but he considered they had gone along very well. The average attendance of twenty-eight out of seventy members was good, and he instanced a meeting of a medical society the night before, and an annual meeting, too, 300 strong in membership, with an attendance of only ten. Referring to the new rooms, he thought the members would agree that their club-room upstairs was extremely comfortable and convenient of access, whilst the library in which they were then seated, and which would be used for all large meetings, lantern shows, &c., was one of the most comfortable rooms in Birmingham. Considering the loss occasioned by the removal of the club room, and the preliminary expenses of the club, the Treasurer's balance-sheet was quite as good as could be possibly expected. The following officers were then elected for 1892-3:—*President:* Dr. Hall-Edwards.—*Vice-President:* Rev. J. Henry.—*Council:* Mrs. Welford, Messrs. R. J. Bailey, Frederick Iles, H. R. Leech, M.R.C.S., H. Roland White.—*Librarian:* R. J. Bailey. *Hon. Treasurer:* Mr. Sam G. Mason.—*Hon. Secretaries:* Messrs. C. Jervis, Fowler, and Frank H. Mason.

Oxford Photographic Society.—October 4, Annual General Meeting. Mr. Ryman Hall (President) in the chair.—The report, read by Mr. Bellamy, showed that sixteen members had been elected during the year, one member, Mr. H. C. Hull, had died, and there had been four resignations. Nineteen ordinary meetings had been arranged, including Mr. Paul Lange's lecture on "Norway," the proceeds of which, amounting to 15*l.* 10*s.*, were handed over to the Radcliffe Infirmary. Excursions had been made to places near Oxford, and conversational meetings had been held. The average attendance showed a decrease on the two preceding years. Two competitions had been arranged, but were not decided. A commencement had been made in the formation of library set of slides for loan to members, and about sixty had already been presented. At the beginning of the year the Society was affiliated with the Photographic Society of Great Britain; under this scheme many privileges were secured to members. The report acknowledged liberal donations towards the furnishing of the rooms, and concluded by reminding members that, by a mutual agreement, the rooms of the Photographic Society of Great Britain, and of the Birmingham and Cheltenham Societies, were available for use by members of this Society. The President remarked that the present state of affairs was not satisfactory, and, unless they had a considerable increase of members, they could only improve their current account by increasing the subscription from 7*s.* 6*d.* to 10*s.* 6*d.* Mr. Ryman Hall was elected President, and Messrs. A. F. Kerry, M.A., and J. H. Salter and C. C. Cole, Vice-Presidents, the name of Mr. W. W. Fisher being added in place of that of Mr. A. F. Stanley Kent, who had removed to London. Mr. R. A. R. Bennett was elected Hon. Treasurer vice Mr. Minn, resigned; the Hon. Secretaries were re-elected, and Messrs. W. J. King, G. W. Norton, A. Robinson and G. Smith, were re-elected on the Committee, Mr. Jenkins being added in place of Mr. H. M. Phillips (Ch. Ch.), who had left Oxford, and Mr. Fortt in place of the Rev. W. H. Price, M.A., Trinity, resigned, and Dr. M. D. Stark.

Rotherham Photographic Society.—October 4, Annual Meeting, Dr. J. B. Baldwin (President) in the chair.—The Hon. Secretary (Mr. Hemmingway) presented the third annual report of the Council, which expressed the opinion that the Society had shown unmistakable signs of progress. The membership had increased, the class of work done had improved in quality, and there had been a better attendance at the monthly meetings. The average number of members present each evening was fifteen. Particulars of the business of the twelve months were given. The excursions had been four in number, viz., Comsborough and Sprotborough, Haddon Hall, Wyming Brook and Rivelin, and Wingfield Manor. The event of the year had been the exhibition in St. George's Hall on February 23 and 24, and a most gratifying success rewarded the efforts put forth. The very friendly relations with the Sheffield Photographic Society had been maintained, and several of its members sent pictures for exhibition. The Council realised the help its near neighbour could render, and considered that a general scheme of federation at no very date might prove of mutual benefit. Members were urged to manifest an increased interest in the Society, the Council believing that with a little energy it was possible to attain to much higher things than had yet been accomplished, and to make the organization in every way representative of the district, which has a population of about 60,000 inhabitants. The report, together with the financial statement, which shows a small balance in hand, was approved. Officers were elected as under:—*President:* Dr. J. B. Baldwin.—*Vice-Presidents:* Messrs. E. Isle Hubbard, W. H. Hayward, and G. T. M. Rackstraw.—*Council:* Messrs. I Wright, W. H. Shepherd, W. Mason, J. W. Whittington, and A. B. Clarke (Rawmarsh).—*Treasurer:* Mr. J. Leadbeater.—*Hon. Secretary:* Mr. H. C. Hemmingway. The programme for the coming season was discussed, the principal item being the holding of an exhibition early in the new year. The optical lantern was afterwards brought into use, and a profitable hour was spent in criticising slides made by the President, Messrs. E. Isle Hubbard, G. T. M. Rackstraw, J. Leadbeater, W. Mason, J. Clarke, and H. C. Hemmingway.

Sheffield Photographic Society.—October 4, Annual Meeting, Mr. B. J. Taylor in the chair.—The Treasurer presented his report, which showed a substantial balance in hand, and was considered very satisfactory, and duly passed, after which the Secretary gave his general report of the proceedings for the year, showing that there had been four resignations and eight new members, that the Society had more members on its books than ever before, that it was altogether in a prosperous condition, and that the proceedings throughout the year had been characterised by each member being anxious to promote the general good of the Society. The excursions had received considerable attention and support, and had produced some splendid work. The officers for the ensuing year were elected as follows:—*President:* Mr. B. J. Taylor (elected for the fourth time).—*Vice-Presidents:* Messrs. G. Bromley, T. Firth, and E. J. Chesterman.—*Council:* Messrs. W. T. Furniss, J. Smith, T. G. Hibbert, W. M. Toplis, and E. Sampson.—*Reporter:* Mr. E. H. Pearce.—*Treasurer:* Mr. Bradley Nowill.—*Secretary:* Mr. E. Beck. After votes of thanks to the retiring officers, the members taking part in the photographic exchange produced their pictures, making in all nearly 300 prints.

Edinburgh Photographic Society.—October 5, Mr. H. J. Blanc, A.R.S.A., &c., in the chair.—The principal business was a discourse by Mr. A. Mann, M.A., on *Telescopic Photography*, in the course of which he stated that this was a subject to which he had turned his attention about eight years ago, and one which had acquired more prominence during recent months through the introduction by Mr. T. R. Dallmeyer of a special new lens for this purpose. The speaker disclaimed any intention of discussing the merits of that instrument, which would doubtless find many useful applications; his desire was rather to show how satisfactory photographs of distant objects could be produced by means of lenses possessed by most photographers, amateur and professional. He expressed astonishment that the subject had not received attention much sooner; for, although the expensive appliances for celestial photography might be quite out of reach of the ordinary workers, yet no obstacle stood in the way of dealing with objects on the earth's surface. The instrument by which most of his experiments in this direction had been made was a small pocket telescope by Dallmeyer, his method of use being to dispense with the ordinary objective and attach the telescope itself to the front of the camera, fitting it into a new portable front he had made—of course, at right angles to the focussing glass. The telescope is fastened—light-tight—at a point distant about one-third of its length from the eyepiece. Before fastening it, he found that, although the instrument could be used of the full length, and as it was, yet it was a great improvement to remove the two inside lenses placed in such instruments a little in front of the eyepiece for the purpose of reversing the image. This, he showed, could be very easily done without injuring the instrument, those two lenses being fixed to one tube, and removable in a moment. The eyepiece is then pushed forward into the place previously occupied by them, which shortens the instrument by about one-third of its length. Three important advantages are thus gained. The telescope being much shorter, the leverage on the front of the camera is reduced, four reflecting surfaces are got rid of, and the width of angle embraced by the instrument is doubled, while the magnifying power is still quite sufficient. One thing requiring special attention is the prevention, as far as possible, of all superfluous light from passing through the camera. When the object-glass of the telescope, which is about twelve inches focus is unscrewed from it and placed in front of the camera, the image on the focussing screen is seen to be a circle of about ten inches in diameter, and it behaves exactly in the same way when placed in the telescope tube. The reversing lens or eyepiece which has to receive the image is only half an inch in diameter, and can only deal with a circle of that area; and, as the area of the one circle is just four hundred times that of the others, it follows that only one-four-hundredth part of the light entering the telescope is utilised in forming the image, the other three hundred and ninety-nine parts tend only to do mischief. This great cone of light strikes against the sides of the tube, and a portion of it is reflected through the eyepiece into the camera, and tends to fog and enfeeble the image on the plate. The most effectual way of dealing with this evil—an evil which applies to all kinds of telescopic arrangements—is to place a blackened board tube of sufficient length in front of the telescope, to cut off all light save that which comes from the object which is being photographed. Such a tube is easily extemporised. For focussing the telescope, the method he preferred was to take it to his eye and focus accurately upon the distant object wished to be photographed, and then draw back the eyepiece a short distance, say a quarter of an inch, before inserting it in its place in the camera. If this is not done, the focus will be much too long for any ordinary one. The camera is then moved out or in until the image is in sharp focus; the nearer the eyepiece is to the object-glass, the larger will the image be on the focussing screen, and *vice versâ*. Another mode of getting the focus is to rack the camera to a suitable length, and varying the distance between the eye and object-glasses of the telescope. A telescopic arrangement for photographic purposes consists essentially of two parts, viz., an object-glass (which may either be a single lens or a combination of lenses similar to those used for ordinary purposes) to form an image of the distant object, and a smaller lens of very short focus placed a little behind that image for the purpose of reproducing it. This arrangement combines the action both of the ordinary photographic camera and that of the magic lantern, so that it can do the work of a whole battery of lenses of different focal lengths, enabling the operator to photograph a distant object to any scale from the same position. As an illustration of the capabilities of this arrangement, the lecturer stated that some time ago he had photographed the gilded figure on the top of the University buildings from a distant window by means of the small telescope already alluded to attached to a whole-plate camera of the ordinary dimensions, and that he had thereby obtained an image six inches in height, while the ordinary lens of the camera, a rectilinear of eight inches focus, gave an image of only a quarter of an inch in height from the same position; so that, to have produced a negative in the ordinary way of the same size, a lens and camera would have been required twenty-four times that of the rectilinear lens, which would have amounted to one hundred and ninety-two inches, or sixteen feet, of a camera from lens to plate. Mr. Mann showed a portrait taken by him with the same apparatus seven years ago, which he said showed fairly sharp definition on the lantern screen, even when enlarged to several times life size; also a telescopic combination suitable for more rapid work, which he had extemporised out of a rapid French portrait lens working at *f*·3 and the eyepiece of a small telescope fitted inside the camera for delineating the image formed by the portrait combination. A short cylindrical tube was fixed to the inside of the camera front of sufficient diameter to admit of the portrait lens being racked in and out, and into the end of this tube was fixed the eyepiece; the focussing was performed by the rack arrangement of the portrait lens, which enabled the image produced (in air) to be placed at any desired distance from the eyepiece. Reference was also made to some of the uses to which such a contrivance could be put, inasmuch as interesting studies of wild animals, sharp photographs of ornaments or designs in the upper parts of buildings and other inaccessible places could be secured from a distance at which they are quite invisible to the naked eye. At places of public resort any one posted on some coign of vantage could command the surrounding district and photograph what and whomsoever they pleased, while in military operations an enemy's position could be surveyed and photographed from a point beyond the range of his guns. A short discussion followed, and Mr. Mann received a cordial vote of thanks for his communication.

Correspondence.

THE LANTERN POLARISCOPE.

To the EDITOR.

SIR,—I beg to offer you a few remarks upon the article by Mr. G. Baker, which appears in your last issue, October 7th (see page 2, *Lantern Supplement*). For many years I have been experimenting on projections and made numerous lanterns here for trial, before placing the work out to be made in a final and presentable form.

I have also had in my hands the counterpart polariscope (by Ahrens)

of Mr. Spottiswoode, which is the property of Mr. Crisp. The results arrived at are these. Mr. Spottiswoode's form of polariscope is now quit "out of the running." My own will not only show numerous results and phenomena not possible with the older apparatus, but also on a far larger scale. A 20 ft. disc of great brightness is attainable by means of the electric light, and suitable lens.

I have been able to show that very fair results may be obtained with limelight; indeed, for experimental research and exhibition the electric light is essential for the polariscope, hence apparatus and means can be employed wherein much light is lost without any inconvenience. Consequently I have used polarising Nicols no larger than ¾ in. in diameter (having a clear way of only ½ in.), giving results not inferior to polarising prisms of 2 or 3 in. diameter. The method is to draw down the large condenser beam, then parallelise it forming a small beam of ½ in. diameter after passing the polariser, this beam is again expanded and parallelised to form a beam of 2 in. diameter, or more if needed. The whole polarising apparatus may be made for 5*l*., and working may be direct, with all the advantages of a large Nicol, no longer to be obtained for love or money. Regarding incandescent 100 candle power (and less power) focus lamps, I would advise no one to use these. With the 100 candle power lamp, nearly half-horse power is converted into heat, and slides will be broken one after the other; the lantern becomes so hot as to be dangerous in a very short time.

I have tried every possible expedient to overcome the difficulty. Of course nothing will prevent the heat of the lamp being generated, but water-screens may be employed to shelter the slides, and lanterns may be enlarged and better ventilated. After making lantern after lantern, and many water-screens, I reached a point where the lantern became a sentry box, into which I could hide myself, and the water-screen a volume of water sufficient to cook an Irish-stew for a small family. Finding that the end in view had not even then arrived, I gave this matter up. However, the lantern was used for some time as a drying cupboard, and for producing warm water. I also was lent a lantern made by Messrs. Steward constructed especially for these focus lamps. But I failed to find the difficulty eliminated, and returned them the lantern as useless in my estimation. In saying this I do not wish to do an injustice to this firm. The lantern was made to the pattern of a customer, so that they were not responsible for the result. Messrs. Steward's lanterns are so well known that it is not likely that I should attempt to disparage their work. My own triple, built by them, is perfection itself.

There is no doubt whatever that the arc light is the right thing in the right place when inside a lantern, and, after all, the additional expense is not large. The same, or even more, horse power is utilised in forming the arc than in incandescing the filament of a 100 candle power focus lamp, yet it must be remembered that light giving rays are produced in the far larger quantity than the heat giving rays, *i.e.* more yellow and blue rays; in the other case the red rays predominate. To put the matter generally and briefly; for a small arc lamp using the same current as a focus lamp, about ten times more light is produced, hence, in round numbers, the focus lamps give ten times more heat. These figures are not accurate, only sufficiently approximate to give a general idea. It is evident, therefore, that all being equal for the same current, a focus lamp gives ten times less light and ten times more heat than the arc lamp. Possibly these remarks may interest some of your readers.—I am, yours, &c.,

DAVID SALOMONS.

Broomhill, Tunbridge Wells, October 8, 1892.

THE EXPANSION OF AMMONIA SOLUTION.

To the EDITOR.

SIR,—My attention has been called to Mr. Haddon's criticism of my article on ammonia in *Dry Plates*, the monthly magazine of the firm of Cadett & Neall. Let me begin by saying I am quite ready to learn from those who know better than myself, and, if Mr. Haddon is right, I can only offer him my best thanks for his correction. I would, however, first point out the disclaimer in my paper where I mentioned that the statements are not original with me. I have simply done what Mr. Haddon himself has done, and quoted from tables by chemists of repute, and accepted their statements as correct, without any personal proof.

I am at a disadvantage in taking Mr. Haddon's criticism from the abridged reports of the journals, as I was not at the meeting;* he must therefore kindly make allowance in what I am going to say in case I am under any wrong impression.

My authority for the statements in my paper is the late Mr. John Joseph Griffin, F.C.S., in his work, *The Chemistry of the Non-Metallic Elements, the tenth edition*. Of course, the work is rather out of date; but, considering that many of the latest books quote from tables much older, I need not apologise on this score. Mr. Griffin was (and the firm still is) the maker of the "Ammoniometer." Thousands of these have been sold and are in use all over the world. Mr. Griffin gave considerable personal attention to the testing and analysis of ammonia in a large commercial way, and he gives directions in his book for: Determination of the chemical strength of liquid ammonia; determination of the strength of ammonia by the ammonia-meter (hydrometer); preparation of liquid ammonia of particular degrees of strength for testing and other purposes.

* The report given in this JOURNAL was an *unabridged* one.—ED.

Now, no human being is infallible, I know that personally *very well* but I may, I think, be forgiven for taking an authority, who perhaps had the greatest experience in the commercial testing of alkalies and acids in the United Kingdom, and I must confess, that until I have tested, personally, Mr. Griffin's tables, or have had further evidence that his statements are wrong, I shall not lightly surrender him as an authority.

Though, until now, I have never doubted Mr. Griffin's statement, "ammonia has the remarkable property of possessing the same bulk in all its combinations with water," I have always been aware of the great discrepancy between various authorities in s.g. tables of *all kinds*, and I have often wondered at it, but doctors will never agree, even in matters one would suppose to be simple facts. I have not Watts' Dictionary, but I presume that the statement, that liquid ammonia of a s.g. of ·884 contains 36 per cent. of real ammonia, is from Carius. It must not be forgotten that Carius was at variance with Roscoe and Dittmar on the important question of the amount of absorption of NH^3 at various pressures, and therefore his s.g. tables may be open to question.

Mr. Haddon has very kindly (and I am sure we all thank him) taken the trouble to put the expansion question to practical test; but he has left one important part undone, he did not verify or question the s.g. table in Watts', neither did I question Griffin's tables, so we may both shake hands on that point.

Let us now turn to the practical side of the matter. An expansion 0·37 per cent. (as per the journals) is, for all practical purposes, a very small matter indeed, and, if Mr. Haddon makes his curve on the data of his experiments, he will be close enough to a straight line to satisfy any photographer's faith in the ammoniometer. The so-called 20 per cent. error in reading strength is purely one of variance in a.g. tables, and, whether right or wrong, does not in any way affect the relative testing with the ammoniometer to an appreciable degree. If the dilution to the extent carried out by Mr. Haddon only gives 0·37 per cent. expansion, how much less must be the expansion between samples of ammonia high in strength!

It becomes mere *straining at a gnat*. I do not say that Mr. Haddon is wrong; but, as he makes the expansion so little, it would be well for him to test the question again under most careful conditions as to the temperature. Surely a curve made on the results of his experiments would scarcely agree with the s.g. tables in Watts' Dictionary.

I will, when not so busy, put the matter to a practical test. Griffin's s.g. table gives for s.g. ·884 a percentage of 31·9 at 62° F. against Watts' 36 per cent.; some one please say who is right; there surely should be some table up to date; however, from a practical point of view, I do not find sufficient reason for Mr. Haddon's experiments to prevent photographers from testing their ammonia, as recommended in my paper. They will not, in any case, be more than a small fraction per cent. in error, one that they would hardly notice in measuring.

An article by Mr. Haddon on ammonia would be much appreciated by us all, and not the least by, yours faithfully,

JAMES CADETT.

Cadett and Neall Laboratory, Ashtead, Surrey.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—There are various reports as to the state of business amongst photographers during the past season, but those who are in the best position for knowing tell us that the winter outlook for assistants, at any rate, is a bad one. This being so, may I say a word about the "Benevolent," and the claim it has upon photographers?

In various recent cases of distress local efforts have been made and special subscriptions raised, without any appeal being made to the Benevolent Association, the committee of which has usually heard of the case when too late to be of use. As the Association is always prepared to grant prompt and practical relief, not only in money, but also in that help which is often better than money, no man who knows of a deserving case need be afraid to make application. In every case the Association makes the most careful inquiries, but treats the particulars in strict confidence. Where a loan will afford the necessary relief, the grant is always made in that form, and it is satisfactory to subscribers to know that in some cases men who have been entirely broken, financially, have been so firmly set on their feet by the Benevolent as to be able to pay back every penny advanced, so that an excellent work has been done without any real expenditure of the funds.

In connexion with the work of the Association there is an Employment Bureau, upon which we have at present the names of a large number of assistants of almost all classes, and some of them very good men, who are seeking situations. Employers who want assistants will greatly help the work of the Benevolent if they will make application to—yours, &c.,

THE SECRETARY, *Photographers' Benevolent Association.*

Memorial Hall, E.C. October 10.

NEGATIVES FROM NEGATIVES.

To the EDITOR.

SIR,—Referring to your article in this week's JOURNAL, October 7, 1892, in reference to reversed negatives, or rather a negative from a negative, as the process is more generally called, I, being in some doubt

as to the success being due to ferrous-oxalate development, I exposed two plates, one Ilford, one Britannia, and developed them with a pyro soda developer. I herewith enclose you the result, with the original negative for comparison. I may say that these negatives are a fair sample of the results obtained. The exposure was eight seconds to fairly good daylight through the studio window. My opinion is the success is in the exposure, for this reason: If you begin with a short exposure, you obtain a transparency; continue the exposure, you get a negative; further expose, and you again find you have a positive; and these changes undoubtedly occur many times over. The chemical action being the same, it must be caused by some reversing action of light on the silver salt. A very good plan to observe these changes is to cut up a few plates—say a dozen pieces, two quarter-plates, six out of each—and make one dozen exposures, beginning at one second, and each time increase as, say, 1, 3, 5, 7, 9, and so on; then develop them and see the result. It is very simple, and the time spent in developing will not be thrown away. The developing is longer than for an ordinary negative. If carefully done, the experience gained will teach a great deal that is useful. The same thing can be done with gelatino-bromide paper, and the change from positive to negative will occur.—I am, yours, &c., E. Frewino.

26, *Eden-street, Kingston-on-Thames, October* 10, 1892.

[The examples of the process our correspondent sends are exceedingly good, it being difficult to differentiate between the original and the copies.—Ed.]

PROPOSED PHOTOGRAPHIC SOCIETY FOR GREENWICH.

To the Editor.

Sir,—I beg to inform you that a meeting will be held at the Lecture Hall, Royal Hill, on Wednesday, October 19, at eight p.m., at which Mr. E. W. Maunder, F.R.A.S., will preside, to consider the advisability of forming a Photographic Society for Greenwich, and to arrange the necessary business details.

It is hoped that you will find it convenient to attend and support the scheme.—I am, yours, &c., Leon. I. Atkinson,

193, *Greenwich-road, S.E.* *Hon. Secretary* (*pro tem.*).

THE PHOTOGRAPHIC EXHIBITION.

To the Editor.

Sir,—I am instructed by the Council to inform you that they have determined to endeavour to obtain yearly a selection from the pictures in the Exhibition such as shall show the progress of the art from year to year.—I am, yours, &c., R. Child Bayley, *Assistant Secretary.*

Photographic Society of Great Britain, 50, Great Russell-street, Bloomsbury, London, W.C., October 12, 1892.

MR. HUBERT AND "UNFORTUNATE."

To the Editor.

Sir,—It would have given me great pleasure to reply to your correspondent, but for the simple reason that "Unfortunate" preferred to hide his lights from my expectant gaze. It may be that so many employers, jealous of my opportunity to possess such a boon, offered him work, that forthwith he went to the highest bidder.

However, it seems to me only right to mention that the printer I engaged in his place on the whole turned out very satisfactory, and is with me now. He was one of those not above being taught, and after I explained the different processes scientifically, which previously he performed in a hap-hazard way, he has now managed to reconcile me to the loss of the other, whose conscience may perhaps be awakened by the renewed correspondence. If he will name his employer, I will forgive; but woe to the latter if I meet him.—Yours, &c., J. Hubert.

238, *Mare-street, Hackney, Oct.* 2, 1892.

SMELL OF THE OIL LANTERN.

To the Editor.

Sir,—In your new "Lantern Record," which I hope will be much appreciated, you allude to the old grievance of the smell from the oil lantern (page 1, Lantern Supplement).

If you remember, I some months ago sent you my method of avoiding this trouble.

From a continued experience and some dozens of trials, I am quite convinced that all unpleasantness may be avoided by following out this plan, viz., never leave in the reservoir or the wicks any oil; to do this after your entertainment is over, and the lamp turned out, immediately empty the reservoir, then relight the wicks, and let them burn *quite out*, by which means all oil is removed from the wicks and lamp.

Do not recharge the reservoir until you are ready to show your slides. The wicks will simply want a rub with a cork or soft pad.

I should not trouble you with this if I were not so satisfied with the result of my discovery.

What was a constant course of annoyance and a deterrent to using the lantern has quite disappeared.

I constantly show to my friends, in a small room, slides with the greatest ease and pleasure. So badly was I annoyed with the murky smell before making this alteration, in working the lantern for parlour showing, that I was contemplating abandoning the use of it. No carefulness in cleaning, wiping, putting in new wicks, or anything else will be so efficacious as this method I have described. Of course, use the best crystal oil, and don't turn up your wicks too high.—I am, yours, &c.,

Camera Club, October 8, 1892. Frank Howard.

DISCOLOURATION OF AMIDOL SOLUTION.

To the Editor.

Sir,—I shall be much obliged if you can give me some advice as to mixing amidol so as to get it to keep.

I have tried the developer with both under and over-exposed negatives, as well as some I believed to be correctly timed, and like it very much.

I find, however, that it discolours in a very few days. I have mixed it in the proportions of amidol, soda sulphite and water, as recommended.

The first time I used tap water (the water is rather hard with a good deal of lime in it), boiled for about an hour, and the time allowed to settle, and poured off clear. The bottle was well stoppered and kept in a dark cupboard. On looking at it after a fortnight I found it almost black. It, however, developed all right, though not so rapidly as at first.

I then mixed some more in the same proportions, but with distilled water (got from a local chemist); and now, after ten days, it is a rich purply brown with some dark coloured sediment in the bottom of the bottle.

This is hardly what one would expect when one is told "the solution keeps well." I should, therefore, be obliged if you can give me any advice on the subject so that I may find out whether the discolouration is my fault.—I am, yours, &c., J. H.

October 10, 1892.

[The discolouration of which our correspondent complains may possibly be avoided by acidifying the sodium sulphite in solution before adding it to the amidol solution.—Ed.]

THE DANGERS OF OXYGEN MAKING.

To the Editor.

Sir,—Our unfortunate friend Mr. T. B. Walshe (see page 8, Lantern Supplement) has had a terrible experience, but a little caution would have saved him a lot of suffering. If he had placed about a saltspoonful of the mixture on a shovel, and placed it on the fire, he would have been warned of its true character. *This should always be done with a fresh batch of oxygen mixture.* Again, it is not necessary to use black oxide of manganese for its *catalytic* action, as fine sand does just as well, and the risk of having black antimony supplied for black oxide of manganese is avoided. This same mistake has been made before, with fatal results, and, if my memory serves me, it happened in Ireland.—I am, yours, &c.,

Liverpool, October 10, 1892. James Wood.

"COOL WATERS" (SHOULD NOW BE "HOT WATERS").

To the Editor.

Sir,—Mr. Whitfield's letter in your last issue clearly shows that he is determined not to be convinced that we *did not* endeavour to pass the picture off as our own production, either by suggestion or otherwise.

To continue harping upon the same false string with such blind pertinacity is, to say the least, irritating after the overwhelming evidence brought forth disproving the entire accusations.

The sweet benevolence in reminding us that it is not yet too late to apologise—for something we had *not done*—is almost sublime.

Reading between the lines of the whole of this affair, it appears to us very like a little game we believe the Yankees call "spoof."—We are, yours, &c., Morgan & Co.

Old Christchurch-road, Bournemouth, October 9, 1892.

West London Photographic Society.—Annual Meeting, 14th inst., at headquarters.

Mr. and Mrs. W. J. Anckorn received a gold medal at the late Paris Photographic Exhibition.

Photographic Club.—October 19, Demonstration of the Platinotype Company's "Magnesium Lamp." 26, Smoking Concert.

Croydon Camera Club.—October 17, *The Pictures at Pall Mall*, by Mr. Maclean; and *Intensification and Reduction*, by Mr. A. E. Isaac. 31, Lantern Night.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—October 20, Fire Lantern Night of the season, Judging of Competition Slides. 27, Members' Open Night. November 3, *Rapidities of Various Printing Processes* (continuation), Mr. B. Foulkes Winks.

THE Blackfriars Photographic and Sensitising Company inform us that they have been appointed sole London agents for Messrs. Walter Griffiths & Co.'s detective, enlarging, and lantern-slide cameras. The Company will also this season cater more for the lantern trade in general than they have done hitherto.

INVITATION EXHIBITION AT THE CAMERA CLUB.—An Exhibition of Pictorial Photographs, selected from contributions made by the leading artist photographers at home and abroad, will commence at the Camera Club, Charing Cross-road, on Tuesday, October 18th, and will be open free to visitors, from 10 a.m. to 12 a.m., and 2 p.m. to 4 p.m. daily, until December 8, on presentation of cards, which may be obtained from Exhibitors, from Members, or from the Honorary Secretary. The Exhibition will consist of selected pictures produced direct by means of photography during the past year.

ON Monday, October 3, while some *employés* of Mr. James Bacon, photographer, Northumberland-street, Newcastle, were at work at 20, Ridley-place, an ignition of guncotton took place. Ernest Baker, thirty-seven years of age, who was using the cotton, was burnt on the face and cut about the arms, and the back kitchen was slightly damaged. Some of the woodwork caught fire, and word was immediately conveyed to Pradhoe-street Police-station, from which place the alarm was raised at the Westgate-station. Superintendent Mathews, with a staff of firemen and the tender, at once proceeded to the place, but the fire was extinguished by a few people employed on the premises, and by some neighbours, before the fire brigade arrived.

BOLTON PHOTOGRAPHIC SOCIETY.—November, *Development of Platinotype Prints (Cold Bath)*, by Mr. S. G. B. Wollaston, and exhibition of "Key" camera work. December: General Exhibition of members' work obtained during past season; Paper by Mr. W. Collier, *A Short Trip to Brussels*, illustrated; *Photography* hand camera competition prize prints. January: Paper by Mr. W. Banks, *Slops: their Areas and Relation to Exposure*. February: Demonstration—*Printing and Toning Gelatino-chloride Paper*, by Mr. J. S. Roscow; General Lantern Exhibition. March: Paper by Mr. R. H. Abbatt, *Process Blocks and Photo-mechanical Printing*. April: Demonstration, *Photo-micrography*, by Mr. W. Hutchinson; *Photography* prize slides. May: Demonstration, *Stereoscopic Transparencies*, by Mr. C. K. Dalton; Arrangements for summer season.

THE HINTON HAND CAMERA.—Messrs. Hinton & Co., Bedford-street, Strand, have brought out a new hand, or stand, camera bearing the above designation. It is half-plate size, and is not magazine, but works with dark slides. It has a focussing screen which is always in position. This screen is seen from behind through adjustable winged doors, which close sufficiently near to obviate the necessity for a focussing cloth. By an ingenious adjustment a strong magnifying-glass is fitted just behind the ground glass, and which is capable of being brought opposite any desired portion of the screen. The shutter, situated behind the lens, is actuated by pneumatic means, and is adjustable as regards rapidity. The camera extends to a considerable range, has two finders, and numerous effective movements, which unite to constitute it a very excellent type of camera.

A DISHONEST PHOTOGRAPHER.—Frank Dudman, thirty-seven, photographer, was recently indicted for having embezzled sums of money received by him on behalf of his employers, Messrs. Hollis & Sons, photographers, of 160, High-street, Camden Town. Mr. Blackwell prosecuted. The case for the prosecution was that on the 12th of August the prisoner called on one of the prosecutors' customers, and collected the sum of twelve shillings for photographs that had been supplied, and on the 22nd he collected a further sum of six shillings, which was not accounted for. The prisoner was manager to one of the prosecutors' branch establishments in High-street, Camden Town. He left somewhat suddenly, and then wrote certain letters admitting that he had taken certain moneys, which he offered to repay on getting work. Detective Taylor, Y Division, on telling the prisoner the nature of the charge, stated that he said in answer to it "I admit it, and am sorry for it, and I intended to pay it back." He was found guilty, and sentenced to six months' hard labour.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—A committee meeting was held on October 7 in the rooms of the Photographic Society of Great Britain, Mr. W. Bedford in the chair. The Secretary reported that, since the last meeting, he had received intimation through Mr. Bedford of a legacy of 52*l.* 10*s.* left to the Association under the will of the late Mrs. Emma Mary Evans. Subscriptions had been received from four new members, and small sums from two collecting boxes. One case of distress had come before the Association. The applicant stated that he had been for twenty years a photographic printer, that his last employer had been obliged to discharge a portion of his staff through decreasing business, and that he (the applicant) had been three months out of work, and with his family was on the verge of poverty. He gave four references, including his last employer, and covering about fifteen years' situations. He asked for assistance in finding a situation, or a grant of money as a temporary relief. The Secretary had made inquiries from three of the references, all of whom gave the applicant an excellent character, and failing to find for him a situation as a printer, recommended him for a different class of situation, which he obtained. On the proposal of Mr. Mackie, Mr. R. Child Bayley was elected a member of the Association; and Mr. H. W. Watts, Rangoon, Burmah; Miss Catharine Weed Barnes, New York; and Messrs. John Lewis and F. Gillard, both of Birmingham, were elected on the proposal of Mr. H. Snowden Ward. The arrangements for the lantern evening at the Photographic Society of Great Britain were fully discussed. The arrears of subscriptions were considered seriatim; various members undertook to personally wait upon certain subscribers, and the Secretary was instructed to write to the remainder.

OUTING OF MESSRS. MORGAN & KIDD'S EMPLOYÉS.—The annual outing of Messrs. Morgan & Kidd's *employés* took place last Saturday, when the party, numbering close upon one hundred, proceeded by rail to Portsmouth, and thence by tram to Southsea. Owing to the growth of the business, the number present this year was larger than at any previous outing. Upon arriving at Southsea, the party proceeded to inspect the various places of interest. Dinner was served at the Esplanade Hotel, where full justice was done to the good things provided. One of the novelties of the dinner-table was a unique invitation and menu card, designed by Mr. Durham (Messrs. Morgan & Kidd's chief artist), and executed in collotype by Mr. Berghoff, the plant for this process having recently been laid down at a great outlay. The health of Mr. and Mrs. Kidd was drunk with great enthusiasm, and a hearty vote of thanks was accorded to Mr. Kidd for his kindness in providing the day's pleasure, this being proposed by Mr. Ernest Morgan and seconded by Mr. Dennes. Both spoke of the great interest Mr. Kidd always took in his *employés*, no matter how humble the position they might hold in his establishment. Mr. Kidd, upon rising to respond, was greeted with rounds of applause, and must have been gratified at a reception which clearly showed his popularity as an employer. He thanked them all for the kind way in which his name had been received, and expressed the hope that he and Mrs. Kidd might long have the pleasure of meeting them at similar gatherings. "Success to the Collotype Department," as the latest addition to the establishment, was proposed by Mr. Dennes and seconded in an able manner by Mr. Durham, who spoke at some length upon the great future which he believed was before this department. As the party were more inclined for sight-seeing than making speeches, an adjournment was made to the beach and pier, and at seven o'clock the journey home was undertaken. Richmond was reached shortly after ten o'clock, all agreeing that a most enjoyable day had been spent and that the annual outing of 1892 would long be remembered.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 17,637.—"Improvements in Magic Lanterns." W. I. CHADWICK.—*Dated October 4, 1892.*

No. 17,642.—"An Improved Instrument for Calculating the Duration of Photographic Exposures." Complete specification. J. A. SCOTT and J. HOWSON.—*Dated October 4, 1892.*

No. 17,723.—"Improvements in Print-washers used by Photographers." A. RADCLIFFE and the SUN CAMERA COMPANY, Limited.—*Dated October 5, 1892.*

No. 17,766.—"Improvements in Photographic Developing Solutions." R. G. WILLIAMS.—*Dated October 5, 1892.*

No. 17,767.—"Improved Method of, and Apparatus for, Developing Exposed Photographic Plates in Daylight." R. G. WILLIAMS.—*Dated October 5, 1892.*

No. 17,768.—"Improved Solutions for Toning Photographic Prints." R. G. WILLIAMS.—*Dated October 5, 1892.*

No. 17,789.—"The Linton Permanent Focussing Attachment." F. PARSONS.—*Dated October 6, 1892.*

No. 17,880.—"Improvements in the Means for, and Mode of, Lifting Photographic Plates." J. PUMPHREY.—*Dated October 7, 1892.*

No. 17,999.—"An Improved Magazine Hand Camera." H. V. BIGGS.—*Dated October 8, 1892.*

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Will exchange a diamond frame Safety bicycle for whole-plate camera and lens, or a good lantern.—Address, H. HOWARD, 63, Victoria-road, Aston, Birmingham.

Whole-plate landscape camera, never used, cost 7*l.* 10*s.*, will exchange for hand camera.—Address, SEWELL BRADY, Portsmouth-road, Long Ditton, Surrey.

Exchange lantern, slides, and gas bags worth 25*l.* for landscape camera, slides, and rectilinear lens 12×10 or 10×8 size.—Address, T. H. PRICE, Photo, Dursley, Glos.

Wanted, first-class hand camera, 5×4 preferred; exchange pair dissolving lanterns, mahogany bodies, four-wick lamps, tripod stand, complete in two cases, slides.—Address, H. COUCH, 11, Waterloo-crescent, Dover.

Will exchange 5×4 "Optimus" rapid rectilinear lens, Waterhouse diaphragm fitted with pneumatic (plunge) shutter, for time and instantaneous, for 5×4 "Optimus" rapid euryscope with iris diaphragms.—Address, J. K. SMITH, Little London, Rawdon, near Leeds, Yorks.

Wanted, fifteen-grain tubes chloride of gold or whole-plate mounts, in exchange for roller-blind shutter for hood one and one-sixteenth inch diameter, Watson's drop shutter for hood one and seven-sixteenth inch diameter, and Lancaster's cyclist's clip.—Address, BERNARD GREEN, Cockermouth.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," *2, York-street, Covent Garden, London.*

PHOTOGRAPH REGISTERED:

John Hosburgh & Sons, Edinburgh.—*Portrait of Dr. Russell, Lord Provost of Edinburgh, in robes of office.*

M. & M.—See answer to T. Sohne.

C. H. OAKDEN.—We shall be glad to have the promised particulars.

J. W. MOORE.—We know nothing more of the method than that given by the author. No doubt oil of cloves is meant.

H. S. ELLERBECK (Kronstad, Orange Free State).—We have duly received the notes and will utilise at an early date. Many thanks.

R. G. asks: "Are thirty grains of citric acid too much for a ten per cent. solution of pyro?"—No. You might even increase the quantity to sixty grains.

A. Z. (Leeds).—In photographing the vault the magnesium light will be best. It will be advisable to have two or three lights fired simultaneously from different points.

WM. MCC.—If iron protosulphate fails to precipitate the gold from your phosphate toning solution, try the effect of strongly acidifying the iron solution with sulphuric acid.

FERROTYPE PHOTOGRAPHER.—I. Formulæ for iodised collodion are to be found at p. 775 of the ALMANAC for 1892. 2. Saxe paper may be ordered of any photographic dealer.

C. SACH.—Any optician will supply lenses accurately paired for stereoscopic purposes. Two lenses of the rectilinear type, taken haphazard from stock, are not necessarily identical in focus.

DOMO D'OSSOLA.—To obtain a greyer print on bromide paper than the sample sent, expose longer and develop less. Bromide does affect the colour, and for the result you aim at had better be omitted.

BISHOP says: "Would you tell how to make a collodion transfer, and oblige?"—The required information would occupy too much space in this column. Better refer to past volumes of the JOURNAL.

ROSEBUD writes: "Could you inform me of a good work on miniature painting, and are they (miniatures) in demand much?"—We know of no such work. Miniatures are only in slight demand we believe.

BELFAST.—The enlargement in question is not a single print made from one negative. It is composed of several prints—four or five—from separate negatives. But great skill is displayed in the joining.

W. R. W.—1. For portraiture, one light (with suitable reflectors) of from five to six thousand candle power will suffice. 2. So that the light falls on the sitter at an angle of about forty-five degrees. 3. Any of the commercial arc lamps.

R. A. S.—Carbon lantern slides do not require varnishing, though there is no objection to its being done. Some workers say that varnish rather tends to give greater transparency to the picture. In this case varnishing is an advantage.

R. COHEN.—The process may be practicable, but the public will, we imagine, be very chary of investing in any Company formed to work a method of producing "photographs in natural colours." We trust that from past experiences and exposures investors will be more cautious in the future.

S. ROSE.—Unless your business is very extensive in enlarging, it will scarcely be necessary to supplement your present arrangements with artificial light for the winter, considering that your work is confined entirely to bromide paper. If you were situated in London or some other large town, the case would be different.

THE NATIONAL AND PROVINCIAL PHOTOGRAPHIC AND PORTRAIT PAINTERS ASSOCIATION ask for any information as to whether there is a book published that deals with the artificial or electric light for photographic studios.—There is no separate work devoted to the subject that we are aware of. Past volumes of this JOURNAL contain all the information published in reference to it.

ANGLICAN.—If the premises were taken on a repairing lease, we do not see how the landlord can be held responsible for any damage that may arise from the wind or storms. We expect that you, as the tenant, will have to do the repairs. By leaving the building as it is, further damage may accrue in the event of another storm. We are not surprised that the landlord does not move in the matter.

T. SOHNE.—The spots on the paper are due to air bubbles at the time of floating between the paper and the solution. They are not noticeable, as you say, until the paper begins to discolour, but they are there all the same. If the paper be printed, or be exposed to light so as to give it a tint, they will then become manifest. Until the paper becomes discoloured the insensitive patches are not seen.

ST. MUNGO asks: "1. Would you favour me with some information regarding the 'Albo-Carbon Light' for retouching by at night? 2. Also, could you explain why the white round the edge of vignettes in chloride prints (aristotypes) so frequently turns yellow?"—I. The albo-carbon light will answer very well for retouching by. The light from the burner had better be reflected on to the negative, otherwise it may prove too trying to the eyes. 2. Imperfect fixation

C. A. S. sends us two negatives that are badly fogged, except for a band of about three inches across, which corresponds with the hinge of the shutter. The plates, our correspondent says, were allowed to remain in the slides about a week after exposure. The hinges of the shutters, he says, are of some black material, coated, he surmises, with indiarubber. Fogging of the plate opposite the hinge of the shutter used to be no uncommon circumstance; but in this case it is clear that the evil arises from some emanation from the wood itself—unless, indeed, the wood allowed light to pass through it. This is quite possible if the shutter was thin and the slide was exposed to sunlight for long.

W. POTTER asks: "Is there any work published on the process of anastatic printing, or where am I likely to gain some information? I have some very old engravings, and want to reproduce by that process some copies for friends. Is it true that the matter must have been recently printed?"—The anastatic process is referred to in most works on printing, but we are not aware that any work specially devoted to the subject has been published. The process is described in *Richmond's Grammar of Photography*. With old prints considerable difficulty is experienced in getting the ink to "set off." The anastatic method has been almost, or entirely, superseded by photo-lithography and photo-zincography.

FAIRPLAY asks: "1. Is an employer entitled to pay all expenses, board, lodging, and railway fares when he sends an *employé* out of town to do a job for him, and thereby deprives him of the use of his own home? 2. Providing this has not been done, what is the best way to recover the money laid out by me."—In reply: 1. Unless there is some agreement to the contrary, we should certainly say that the employer should pay all reasonable out-of-pocket expenses. Indeed, we are surprised that any one should demur to do so. 2. The County Court, we expect, would be the only means of recovery. Perhaps some of our correspondents will kindly inform "Fairplay," and possibly others, what is the custom in such matters.

A. BROWNFIELD asks how to recover the silver from gelatine emulsions.—Several methods have been from time to time recommended, but probably the best, and at the same time most simple, is this: Liquefy the emulsion by heat, and then stir in gradually sulphuric acid in the proportion of about one pound to the gallon. The mixture should be made in a large vessel, and after the acid has been added it should be filled up with hot water. The acid destroys the viscosity of the gelatine, and the bromide of silver settles to the bottom. After decanting the supernatant liquid, and washing the bromide with one or two changes of water, it may be collected and dried ready for reducing in the furnace, or sending to the refiner.

H. D. MASON, of 46 Annerley-street, Earl-road, Liverpool, says: "Could you, or any of your readers, tell me how I can get my specimens back from Messrs. Neil & Co., Melbourne? I answered their advertisement in August 1890, and sent specimen, &c., as desired, and have never heard from them or seen the specimens since. I have applied to their agents (Gordon & Gotch, St. Bride-street). I sent stamps to pay postage back, so they have not that excuse. The specimens were chiefly 13×8, and 24×18 direct. Being the only specimens I had of those sizes, it has lost me more than one engagement."—Our correspondent's case appears an extremely hard one, and we trust that the publication of his complaint will lead to the recovery of his specimens.

THE Leytonstone Camera Club are holding their first annual exhibition and competition on Thursday, Friday, and Saturday, the 10th, 11th, and 12th of November, at the Masonic Hall, High-road, Leytonstone. There are eight classes, four members' and four open. Sixteen medals are offered for competition. Lady Brooke has consented to open the exhibition of Thursday, the 10th, at six o'clock p.m., and will in all probability be accompanied by Lord Brooke, who, by the way, are both amateur photographers. The Judges are Messrs. A. Horsley Hinton, Rev. F. C. Lambert, and Mr. E. J. Wall. The exhibition will consist of photographic productions of the leading amateur and professional photographers in the United Kingdom. Apparatus, &c., will be exhibited, together with some of the latest novelties and appliances. Lantern displays will be given twice during each evening. A fresh feature every half hour throughout each evening. High-class musical selections by the Veronese Orchestra, under the direction of Signor Constantine Baga. Entry forms and particulars of the open classes and spaces for exhibits can be had on application to the Hon. Secretary, Albert E. Bailey, Rose Bank, South-West-road, Leytonstone.

FORTHCOMING EXHIBITIONS.

October 17	.....	Camera Club.
November 10–12	.....	*Leytonstone Camera Club.
,, 15–17	.....	*Hackney Photographic Society.
,, 17–19	.....	Brixton and Clapham Camera Club.
		North Middlesex Photographic Society.
,, 24–26	.....	*Exeter Amateur Photographic Society.
		*South London Photographic Society.

* Signifies that there are open classes.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1694. Vol. XXXIX.—OCTOBER 21, 1892.

MYSTERIOUS MARKINGS ON NEGATIVES.

It is by no means an infrequent thing for some photographers to meet with strange markings, or fog on negatives, for which, experienced though they be, they cannot at once account and sometimes entirely fail to discover the origin. Several instances of this have been brought under our notice during the last two or three months. The kinds of markings under consideration may be, more or less, classified as fog, and have evidently more than one origin. Some appear only in irregular patches, while in others the plates are marked or fogged almost all over. The fog is not, however, homogeneous, like ordinary fog. Often the defects, from their appearance, if occurring on a wet-collodion plate, would at once have been put down to dirty glass, except that nothing is to be seen on the glass side of the film, and that it is more or less granular in nature.

Some negatives of the whole-plate size were recently sent us in which the markings were in patches of various sizes, some very pronounced, and others so faint as scarcely to be noticed at all. A careful examination with a lens showed that in this case the granularity took the form of the grain in some kinds of thin paper. The plates in question, it turned out, had been packed with paper between them by the makers. From this it was concluded that the plates had been packed either before they were thoroughly dry, or that the packets had been kept in the damp after they had been issued from the manufactory. There is yet another way in which the moisture might have found its way to the film.

It is no unusual thing, with plates of larger sizes than those in general use, to open a packet, take out what is required for immediate use, and repack the remainder, which may not be wanted for some time. Now, the atmosphere of the dark room usually contains a considerable amount of moisture, and, if the plates have been kept in a cooler place than this apartment, moisture will at once condense upon them, and consequently be absorbed by the film. Then, if paper, however pure, were pressed against it for perhaps some weeks, its effects would certainly become manifest. We mention this, as it is scarcely conceivable that plate-makers would send out plates unless they were perfectly dry at the time. It may be asked, if dampness be the cause, why the markings are not uniform all over the plate? It must, however, be borne in mind that, the closer the film is pressed in contact with the paper, the more pronounced will be the effect, and that much of the glass used is by no means flat.

It was no uncommon thing, at one time, for plates that had been kept in dark slides for a long period to show on development a band of fog across them corresponding with the position of the hinge of the shutter. This was obviously due to some deleterious emanations from the material of which it was composed. This may, however, be considered a thing of the past, as camera-makers now only employ such material for the hinges as they know to be inert.

Among some of the negatives lately submitted to us, that portion of the plate which had been opposite the hinge of the shutter of the slide in which it was kept has been perfect, while the whole of the other part has been fogged. In these cases it is clear that the hinge has acted as a protection, and that the evil is due to the shutter itself; and in this instance the fog appeared to be marked indistinctly with the grain of the wood. As in all wooden shutters mahogany is employed, it can scarcely be imagined that it would exhale anything that would act injuriously on the bromide film. Hence, if the evil arises from pernicious fumes, they must be sought for in the material with which the inside of the shutter is blacked. In one case, in which we had the opportunity of seeing the slide, it had been blacked with a size colour, which had become removed in places by constant dusting, leaving the naked wood exposed. Now, it is quite conceivable that, if decomposed size was used, and the slides were stored in a slightly damp place, and afterwards exposed to the heat of the sun, something might be given off that would act deleteriously on the sensitive film. The vapours of some resinous matters also have a pernicious effect on sensitive films. It was long since found that dry-collodion plates suffered by being stored in grooved deal boxes.

It must not be taken as conclusive, however, that because fogging appears only on such portions of the negatives as are opposed to the wood, and not where it is covered by the material forming the hinge of the shutter, the evil is due to exhalation, because it may arise from quite a different cause. Wood, when sufficiently thin, is transparent, it is also porous; and some of the inferior sorts of mahogany, such as is used for some cameras, particularly so. Many shutters of dark slides are not more than the eighth of an inch thick, some even less. Now, it is easy to see that a highly sensitive plate, protected only by such a shutter, would become affected if the slide were exposed for a time in strong sunlight; and this is often the case with some workers, who seem to consider that, so long as the joints are good, the slide is perfectly safe. That is a mistake.

When plates are fogged, and the fog appears on those portions that were opposite the wood of the shutter, and is absent opposite the hinge, it is more likely to be caused by light passing through the wood than from any exhalations from it. In either case we should recommend, as a preventive of the trouble, that the inside of the shutter be treated in the following manner:—First remove the old black; if size colour, with

sponge and warm water; if varnish colour, with spirit. Then mix some "vegetable black" with thinned spirit varnish—ordinary negative varnish will answer—and coat the wood with it, well working it into the pores. After the coating has become quite dry and hard it should be rubbed down with fine glass paper. This will remove some of the black from the surface, but will leave it in the pores of the wood, which will still appear as hollows. This treatment should be repeated, and a third time if necessary. The final coating must be left intact. Unless the coating were smoothed down with the glass paper, the successive layers might make the shutter too thick and uneven to work freely. The object of this treatment is to entirely fill up the pores of the wood and render it impervious to light, and, at the same time, obtain a coating of varnish that will prevent the exhalation of injurious matters.

THE STORAGE AND TREATMENT OF SENSITISED PAPERS.

It is difficult to realise that we have already nearly arrived at the end of autumn, and that we shall soon be surrounded by the innumerable troubles that arise during the colder months of the year from damp and attendant causes. It has been customary, in years past, to briefly allude to such matters as they are likely to arise, and to suggest the necessary precautions for their avoidance, but we believe that hitherto no place has been found amongst these seasonable warnings for any mention of the necessity for special winter treatment of our modern sensitised papers.

This is chiefly owing to the fact that several of the newer kinds of printing paper can scarcely yet be said to have taken a firm hold on the popular fancy, although, perhaps, in some hands they are beyond the trial stage. Platinotype has, indeed, been in use for so many years, and is employed by so large a proportion of both amateur and professional photographers, that it may be removed from the category of "new" processes, though even it, in some of its more modern forms, can hardly yet be deemed to have passed its trial. We need not, however, stay to discuss the precautions against damp necessary in working platinotype, since these form amongst the most important of the instructions issued by the manufacturers of the prepared paper for the guidance of the consumer.

The printing surfaces to which we desire more especially to allude are those having gelatine as a basis, but more especially those in which the sensitive film is composed of that substance in conjunction with a soluble salt of silver, or of other soluble and hygroscopic matter in the absence of active silver compounds. Gelatine itself, we all know, is readily acted upon by damp, which it freely absorbs if the opportunity present itself; but the danger thus arising is comparatively small, for the carelessness must, indeed, be great that would submit sensitive films, whether plates or paper, or even finished negatives, to such a degree of moisture, or to such conditions, as would cause their destruction without other aid.

Dry gelatine plates, or films on paper that are prepared for development, may be considered comparatively safe from damp if stored in an ordinarily common-sense way, though, of course, even these require the exercise of some additional care in winter. But the different "printing-out" papers which possibly contain soluble and more or less hygroscopic matters that, though inert while perfectly dry, are brought into a state of activity in the presence of moisture, must be considered from an entirely different standpoint.

Going back to the old days of albumenised paper—before the advent of the ready-sensitised article—it will be borne in mind how difficult it was to preserve the whiteness of the paper after sensitising, *especially in summer*. Here we seem, at first sight, to have the reverse conditions; but such is really not the case, for it was only the high temperature that assisted the moisture in the albumen film to cause the rapid discolouration in hot weather. The soluble and hygroscopic nitrates formed during sensitising acted, in the first place, by keeping the paper slightly damp, and then the heat completed the mischief; but, if such paper were perfectly desiccated after sensitising, and then hermetically sealed in a dry atmosphere, the discolouration was prevented for a very considerable time. In the winter months the difficulty took another form, for, though the discolouration failed to make its appearance with the same rapidity as in summer, the protracted period in the printing frame—sometimes extending to days—and the increased proportion of moisture in the atmosphere often rendered it scarcely less troublesome.

The conditions that prevail with our modern papers are not one whit more favourable to keeping, while the additional trouble is added of the decomposition of the gelatine film itself, or what is equally as bad, its softening and subsequent adhesion to anything with which it may be in contact. The coagulated albumen film had the advantage of insolubility, though even it would stick to the negative if allowed to get damp. But nowadays, with gelatine negatives and gelatine paper, the danger is immensely intensified under all circumstances where moisture has a chance of obtaining access, whether in the storeroom or in the printing frame.

As an instance of this, we some time ago purchased a packet of cut gelatine paper at a suburban dealer's, where possibly, though a good business was done, that particular article did not "move" very rapidly. At any rate, the particular batch of paper we refer to was found, upon being opened, to have been converted into a solid block by the damp of the previous winter and subsequent drying. Being a development paper, we managed to make some experimental use of it by soaking the sheets apart and redrying, a course that would have been hopeless with the ordinary run of "printing-out" paper.

What we would recommend our readers, especially the younger ones, to do is to always, if possible, open their gelatine films in a warm room, and to see that they are perfectly dry; if not, to render them so by the application of gentle heat. In the case of printing-out paper, there need not be the least difficulty in doing this, as the sensitiveness is such as to allow of the packet being opened in the ordinary sitting-room, and, if necessary, dried at the open fire. It is seldom, however, the paper would be issued from the maker's so carelessly packed as to require the latter treatment; but a very few minutes' exposure in a cold room at this period of the year will suffice to set up such conditions as not only to require drying at the fire, but to utterly ruin the paper in a very short time if that precaution be neglected.

It is this point we wish especially to emphasise, namely, that, though the paper may be in perfect condition when opened, it will in a very short time, especially in a cold room, such as most amateurs' dark rooms are, absorb sufficient moisture to set up a chemical change if the film contain soluble matter, and most likely to stick the whole into a solid block if repacked in that condition. Hence we say, First of all open the packet in a warm room and see that it is dry.

In repacking it also observe that it is still dry, and add the

additional precaution of wrapping it in tinfoil outside the first paper. This, if properly done, will prove a perfect protection against damp, and will remove all danger from that cause.

Then, again, in using the paper, before placing it in the printing frame make sure that not only the paper itself but also the negative film are perfectly free from moisture, otherwise there will be every probability of the two adhering. Even if this do not occur, the negative is pretty certain to absorb some silver from the paper, with the result that in a short time it becomes hopelessly stained.

Finally, see that the pad of the printing frame is perfectly dry. This is, at the present season, perhaps, the most important point of all, for it is really remarkable what an immense quantity of moisture is absorbed and persistently retained by a pad of felt, or even of bibulous paper. In our own practice we use felt, and, after a day's use, we find it necessary to place the pads for a considerable time in a hot oven until they cease to show signs of dampness. A pad that has lain in the printing frame for a week will, upon holding it to the fire, give off steam, as if it had just been wrung out of water.

It is scarcely necessary to point out how injurious would be the action of such a pad upon a sheet of gelatino-chloride paper placed in contact with it for a whole day, or even longer, with perhaps the chance of a stray gleam of sunshine occasionally to help draw out the moisture. In order to avoid this risk, we again recommend the resort to tinfoil as a final safeguard, a piece of it being placed between pad and print to isolate any chance damp that may be left in the former.

After printing, if an airtight case be not in use, the prints should be wrapped in tinfoil until required for toning. If this precaution were invariably observed, there would be fewer complaints of difficulty in toning.

Volcanic Photographs.—A paper, illustrated by a large number of photographs printed from process blocks, appears in a recent number of *Nature*, and shows plainly the great value of photography in recording the facts of natural phenomena. A few years ago only these photographs would have been translated by the graver's tool into very pretty woodcuts, the scientific value of which would entirely depend upon what could only be termed the engraver's interpretation of the photographic prints. These photo-engravings, large and small, are eight in number, and give a most excellent idea of the various localities at different times and conditions of the volcanic outburst.

Effect of the Ultra-violet Rays on Plant Life.—A very interesting memoir on this subject was recently presented to the Paris Academy of Sciences. The whole paper was replete with descriptions of remarkable experiments; but, as they are foreign to our science, we may merely say that it was found that the particular rays which are so specially active in photography were powerfully so on plants. While the rest of the spectrum rays had an accelerating effect on the growth and development of the plant, it was found that even at a distance of three or four yards the ultra-violet rays were prejudicial to the normal development of the plants, and to correct this glass shades were employed as interceptors.

"A Black Sheep."—Respectable Manchester photographers are to be congratulated upon the thorough *exposé*, by a local paper, of the evil doings of a photographer for some time past domiciled in that town. For years, it seems, this man's disgraceful behaviour towards his lady sitters has been notorious, and we are glad that the courageous revelations of several of them have [illegible] enabling our contemporary, *Spy*, to denounce him in such a manner as to, we hope, leave him little chance of carrying on his loathsome doings in future. His real name is said to be, not Sauvy, but Zalkind, and, instead of being French, he is a Polish Jew. His address is (or was, we trust) 22A, King-street, Manchester. The thanks of photographers throughout the country are due to *Spy* for its forcible and vigorous action. For our part, we are happy to know that Zalkind is a conspicuous exception to the general rule that photographers are a body of men as honourable and well conducted as any other in the community.

Retouching by Electricity.—"Some time ago," says *Anthony's Bulletin*, "we published a series of articles on retouching by Mr. Redmond Barrett. Taking these articles as a guide, retouching may be made simple and rapid by the use of an instrument now on exhibition in the store of our publishers. This is a small metal pencil-holder, at one end of which is a little electric motor worked by two bichromate cells. The other end carries the pencil, which is carefully sharpened with fine emery cloth. The holder is supported by a brass spring, the hand, therefore, simply serving as a guide. The cells being connected, the pencil rapidly revolves with a slight wobbling motion. The negative is rubbed over with Venice turpentine, fixed upon the desk, and all that is necessary is for the operator to guide the pencil. The instrument cannot certainly supply the worker with the requisite knowledge of anatomy, but it gives him the mechanical part, and supplies him with the means to rapidly and delicately carry out his ideas to the desired end. A cabinet bust portrait may easily be completely retouched in fifteen minutes, entailing but little fatigue to the operator."

Stills and the Excise.—That we were not in error in alluding to a widespread ignorance in the matter of excise requirements in regard to stills has further proof, if it were needed, in a letter to the editor of the *Chemical News* last week. The writer, Mr. P. Gerald Sanford, F.C.S., states that one of the results of his application for permission to purchase in quantity the old form of methylated spirit has been the visits of four Government officials, who, discovering, as was natural in a chemist's laboratory, a variety of stills and retorts, informed Mr. Sanford that he had no right to use them without a licence, which would cost 10*s.* 6*d.* Having made inquiries, and finding that few, if any, chemists paid such a licence, he refused to pay; and, after a correspondence extending over several months, he at last obtained—chiefly, he believed, through the efforts of the Secretary of the Institute of Chemistry—the necessary permission to use stills and retorts "for the purposes of his profession." This fresh evidence does but give fresh force to our suggestion that the Photographic Society of Great Britain should place themselves *en rapport*, similarly, with the Inland Revenue officials.

Wanted, a Donor of a Big Telescope.—Not content with their own existing possessions, Professor Pickering, the Director of the Observatory of Harvard College, has issued a circular inviting the wealthy to consider the opportunity offered for a donor of two hundred thousand dollars "to have his name permanently attached to a reflecting telescope, which, besides being the largest in the world, would be more favourably situated than almost any other, and would have a field of work comparatively new." The telescope in question would be placed in the station established by the Harvard College Observatory, near Arequipa in Peru, at an altitude of more than eight thousand feet. The great drawback to the use of these large instruments, and especially when photographic purposes are in view, is the difficulty of obtaining a clear and still atmosphere; but in the proposed regions the sky is nearly cloudless, and a small telescope already established there has shown that the atmosphere is also remarkably steady. The circular concludes by saying: "Even under the most favourable circumstance a startling discoveries—relating, for example, to the existence of inhabitants in the planets—are not to be expected." "It is disappointing to learn this, for a syndicate of photographers might otherwise be started to photograph them. That their [illegible] would ten[illegible] a commercial success cannot

Improvements in Photographic Lenses. — One is frequently seeing improvements in photographic lenses announced, usually through the Patent Office, and often by amateur opticians, who have but little knowledge of optics, and no cognisance of what has been done before. Here is a case in point. The specification of a patent has just been published for an improvement in the adjustment of the optical and visual foci of photographic lenses. The improvement consists in fixing to the sliding tube, in which the lenses are mounted, a pin, which works in a slot in the jacket of the mount, corresponding with the distance between the optical and chemical foci of the combination, so that, after the visual focus has been obtained, the tube is moved the distance permitted by the fixed pin and slot. Now, most persons are aware that the difference in the optical and chemical foci of under or over-corrected lenses varies according to circumstances. As the conjugate focus is increased, so is the difference between the two foci increased also—a condition not allowed for by the patentee. No opticians now turn out photographic lenses in which the two foci do not coincide. The patentee dates from the Optisch-occultisches Institute, Munich. But for the fact that the world-wide-known firm of Steinhiel are at Munich, one would, in the face of this specification, have surmised that the Bavarian capital was fully a quarter of a century behind the age in photographic optics. But the same may, perhaps, be said of some patented lenses initiated in London.

THE CAMERA CLUB EXHIBITION.

In this admirable Exhibition, held in the large room of the Club (which has been newly redecorated), there is a fine collection of photographs, excellent alike in execution and intention, in many of which, however, technical excellence has been placed on one side in favour of pictorial merit. It is a tribute to the catholicity of selective taste felt by the Club Committee that among the two hundred or more pictures hung several are the work of professional men, while many of them are duplicates of some of the most successful photographs now on view at the neighbouring Exhibition of the Photographic Society of Great Britain. The *raison-d'être* of the Camera Club Exhibition is given in the following brief preface to the catalogue:—

"The intention of the promoters of this Exhibition has been to gather together, by careful invitation and selection, the best photographic pictures of the year. Such a system, it may be said, of invitation and selection is now, for the first time in the history of photographic exhibitions, initiated in England, although Vienna and Brussels have already adopted such an obviously rational course. The invitations have been limited, and addressed to those photographers only who are known to produce artistic results. So enthusiastic has been the response, and so large the number of contributions sent in, not only from this but also from foreign countries, that the exigencies of space in our gallery have rendered the question of hanging the exhibits a somewhat embarrassing one. The space at our disposal has, of course, necessitated the exclusion of some contributions; but it is believed that such a necessity was anticipated by the exhibitors, and will meet with cheerful acquiescence. There can be little question that the title, 'Photographic Pictures of the Year,' is one which is justified by the conditions under which the Exhibition has been organized."

Although perhaps not the most excellent from a purely pictorial point of view, there is nothing in the Exhibition that surpasses in general interest a series of five photographs by Shapoor N. Bhedwar, of Bombay, depicting the consecration of a Parsee priest. The first picture shows the Zoroastrian head priest invoking a blessing upon the initiate, the expression of whose face must touch the spectator. In five progressive stages is shown the whole progress of the initiation, until the young candidate for "holy orders" is duly qualified as a priest.

Among several pictures exhibited by Baron N. de Rothschild, that of *Nach der Arbeit* (After the day's work) will be inspected with admiration. In it we have a peasant enjoying himself outside a wine house, a common enough subject, but well treated.

Although the *Caller Herrin'* of Mr. A Burchett is one of the most imposing photographs in the room, and is undoubtedly well composed, yet is the lighting not natural. Here we have a girl in the open with a basket of fish beside her. In the rather dull surroundings we have no strong light or shade apparent, and yet in the girl's face there are shadows so heavy as to suggest that the figure has been taken in a studio specially adapted to give such strong contrasts as to leave portions altogether dark. In nature one does not find such discrepancies as are there presented.

Ralph Robinson's picture, *A New Pet*, is probably the best of all his exhibits. A certain "something" has just arrived in a farm outhouse, but whether it be a calf, a foal, a kid, or something of like nature, is left to the imagination of the spectator, who is less fortunate in this respect than the three rustics who are outside and peering into the interior. A second picture by the same artist, *Making Friends*—a peasant woman engaged in getting into the good graces of a young calf—is highly meritorious, while his two other exhibits are also good.

A noticeable feature of the Exhibition is the large number of small pictures—quarter-plates and smaller. Of these we like Mr. H. M. Hastings' *Coming in with the Tide*, a delicate little yacht study; and the same exhibitor's *Tyne*, *Drawing Timber*, and *Ploughing*—these last three, however, to our fancy, would have had the finer details better rendered on a surface paper. Mr. T. J. Bright, with two placid studies of *Home to the Midday Meal* and *The Barley Harvest;* Mr. J. Guardia with *A Normandy Smithy*, Mr. H. E. Davis with *A Break in the Storm* (the cloud effects of the latter being forcibly treated), *Far from the Madding Crowd*, a solitary reaper at work, and the Hon. Sec., Mr. Davison, with ten small landscapes, are among those who shine in this particular class, most of the pictures being printed on rough sepia toned paper.

Mr. Karl Greger is represented by several pictures in his Pall Mall vein, of which we like the crisp and brightly lighted *June in the Fens;* Mr. Bergheim by several of his fine head studies, while Colonel Gale also has half-a-dozen pictures, than which nothing is better than *The Incoming Tide*, full of poetry and clever treatment of atmosphere. Lieutenant Gladstone's interior, *Mont St. Michael*, is technically excellent, and in the department of architecture, Mr. F. H. Evans also excels with his Canterbury and Gloucester series. Mr. H. P. Robinson's two pictures scarcely do him justice, the lighting of the women *Gossiping on the Beach* being rather faulty. *The Rising Lark*, a large study of two women looking upwards, is the better of the two; while his *Midsummer*, which is so placed as to elude general observation, is one of the most extraordinary landscapes in the room. Mr. Sutcliffe has a series of six not up to his usual mark. In one, the *Orthographer and his Fond Father*, a child spelling the name of a boat in the presence of a small crowd of salts, it is difficult to pitch on the man who has the honour of paternity of the phenomenon. Mr. W. L. Colls' series are admirable in technique and composition, and we like the effect of Mr. Keighley's *Gathering Clouds*. Mr. Clarence Moore's study of *Two Little Niggers*, a boy and a girl smiling together, is a clever and natural bit. Mr. Henry Stevens's *Orchids and Ferns* is quite in his usual admirable style, while the picture of his inevitable fox terriers in *Ratters*, is a capable example of animal photography. Mr. W. Crooke sends a large well-executed portrait of *Paderewski*, and Mr. Maskell three portraits of a lady, Mr. Davison, and Mr. Corbould; the one of Mr. Davison is not a good likeness. Mr. Paul Lange's *Off Aalesund* is noticeable for the cloud effects, which are vigorous and full of animated contrast.

Mr. S. Bourne's landscapes are sound, conscientious photographs, and in *The Old, Old Story* Mr. W. R. Cassels very ably depicts the fateful moment when a lover is presumably putting the question of questions to the object of his affections. Mr. Lord's *How's That*, Mr. Durrant's *Monk* studies, and Mr. Diston's *Highland Smugglers* are duplicates of those gentlemen's Pall Mall exhibits, which it is unnecessary to criticise. The lady in Mr. Lyddell Sawyer's *Study* is most naturally and elegantly posed, and Mr. D. Alexandre's *A Bivouac* and *A Modern Lesson in Anatomy* (the latter a group of students round a patient) are successful examples of subjects difficult owing to their lighting.

Tennysoniana is the theme of the exhibits of Mr. H. H. Hay Cameron and the late Mrs. Cameron, the portraits shown being in the well-known style of both artists. Other exhibitors include Richard Keene (with good architectural subjects), B. Alfieri (whose *Grey Dawn* shows a capital effect of mistiness), R. Terras, M. Auty,

E. G. Lee (whose small work is of the same quality as his lantern slides), R. Briant (the extreme fuzziness of whose *Reed Fringed Mere* is, we believe, due to the picture having been taken by means of a slit), B. Gay Wilkinson (with a beautifully defined *Millpool*), A. Horsley Hinton (whose *Reed Harvesting* has his usual "broad" treatment), P. Ennis, A. R. Dresser, G. Loppe, A. Kapteyn, Rev. F. C. Lambert, S. Conway, H. Tolley, A. J. Leeson, Captain Abney (with three excellently exposed and defined views of *Folkestone Harbour*), D. Strakosch, Lyonel Clark, F. Hollyer, E. Calland, and others.

The one thing of special interest from a semi-scientific point of view is a group of exhibits by H. Van der Weyde. It is a means of reducing the dimensions of any particular part of a photograph. For example, we all know that ladies sometimes complain of the undue dimensions given to their hands or feet by the photographer; or the head may be too large for the figure of the sitter. By the discovery of Mr. Van der Weyde this species of imaginary discrepancy may be entirely rectified. The details of his method for effecting this have not yet been made public, although it will be so eventually, as he has promised a demonstration at an early date. It is understood, however, that the interposition of a lens between the negative and the offending and too large member, has to do with the method of cure. Be the precise *modus operandi* what it may, the results thus obtainable will appeal to a large mass of the community as an improvement. Projecting parts of a figure are in the photograph sometimes considerably enlarged, and if by optical means these can be reduced in dimensions, all the better, at any rate from the art point of view.

The Exhibition, which is to be open for several weeks, is one in which the Camera Club may take legitimate pride, and is highly creditable to its organizers. The principle of only hanging invitation exhibits doubtless ensures a high average of excellence, but it has the drawback of excluding works by unknown men which might conceivably be not less worthy of such a distinction than the productions of those known to fame. In this respect the Photographic Society's and other similar Exhibitions still fill an office the utility of which is beyond question.

CONTINENTAL NOTES AND NEWS.

Restoring Faded Prints.—*Apropos* our recent articles on this subject, we observe that a Continental journal summarises the following method. Immerse the print in a solution consisting of

Saturated solution of mercuric chloride acidified with HCl	20 drops.
Distilled water	1000 c.c.

When the print has attained the necessary depth, it should be washed and dried, and may then be carried to a warmer tone in a toning bath of chloride of gold and potassium.

An Exhibition of Photographic Journals.—At Brussels, next May, an international exposition devoted to the Press, ancient and modern, is to be held in the Musée des Beaux Arts, and our Belgian contemporary, *Helios*, has been given charge of the section embracing photographic journalism, and will endeavour to gather together a complete collection of the publications devoted to photography throughout the world.

Celluloid Varnish.—The *Rundschau* mentions a fact, several times referred to in these columns, but still apparently not generally known, that celluloid dissolved in amyl acetate forms an excellent varnish for a variety of photographic purposes.

The "Bulletin Belge."—M. Hector Colard has resigned the Editorship of the *Bulletin* of the Association Belge de Photographie, which, as we have frequently had occasion to remark, forms an admirable *résumé* not only of the proceedings of this important Photographic Association, but also of the current literature of photography.

Toning with Cobalt.—M. Redares has communicated to the Société des Amateurs Photographes de Paris a note relating to the employment of cobalt for toning, in place of chloride of gold. He has tried different salts and has selected the chloride, the others only acting very slowly. The cobalt, he observes, instead of being deposited on the albumen-silver image in the metallic state, is thrown down as a brown oxide. The following is the formula he employs:—

A.—Water	1000 c.c.
Chloride of cobalt	10 gr.
B.—Water	1000 c.c.
Acetate of lime	40 gr.

100 c.c. of A and 120 c.c. of B are mixed and allowed to stand for three or four days, the solution filtered, tested with litmus paper, and, if found to be acid, a few drops of a ten per cent. solution of bicarbonate of lime are added, or, if alkaline, hydrochloric acid 1 : 10 is added, it being necessary that the bath should be neutral, otherwise it will not tone. Toning, however, takes two or three days, but fixing is accomplished as usual in hypo. The author says the results leave much to be desired, but he hopes to improve them. He also states that he toned with a similar bath in two hours, but he does not give the formula.

Potassium Chloride in the Oxalate Developer.—As a means of imparting sepia tones to bromide prints developed with ferrous oxalate, M. Hector Colard advocates the addition of chloride of potassium to the developer. The following is the formula:—

A.—Water	1000 c.c.
Oxalate of potash	330 gr.
B.—Water	1000 c.c.
Chloride of potassium	130 gr.
C.—Water	500 c.c.
Ferrous sulphate	24 c.c.
Citric acid	2 grammes.
Potassium bromide	2 „

For use twenty parts of A, five of B, and five of C. The more of B that is used the more decided will be the brown tones obtained.

AMIDOL.

THERE appears to be much interest taken at the present time in all the photographic journals in the above new developing agent. I therefore venture to offer the following description of some of my experiences with the above developer, thinking it may be of interest to many of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY who may not yet have tried the above valuable developer.

To all who have not tried it, I say do so as quickly as possible, as the time of year is now coming on when all the help it is possible to get from developers will be of the greatest service. It is one of those things that, when it has been once fairly tried, it will be always used, for all rapid, or other particular, or important work.

On Saturday, October 8 last, I had to take three cabinet negatives in a very bad light (heavy black clouds, no sun), just before it rained, between 11.30 and 12 midday. One was of a restless pony, another of the same pony in a trap containing a lady, little boy, and a dog, and the other was the lady, little boy, and a dog. A rapid rectilinear lens of 12 in. equiv. focus was used; the first had *f*-32 stop, and the two last *f*-24 stop. The exposure given was cap on and off as quickly as possible, time probably between a quarter and half a second, certainly not more than the latter. I commenced to develop with one part amidol stock solution, to three parts of water, which developed a great part of the image. I then added some crystals (several grains, number unknown) of amidol and sulphite of soda to the developing solution from time to time during the hour or thereabouts the development was taking place.

These additions, of course, increased the developing power of the solution wonderfully, and saved all the negatives. In fact, they were much better than could have been expected under the circumstances, and I firmly believe no other developer known to me would have produced anything like the amount of detail in the deepest shadows as these negatives show. *Of course, they were all more or less underexposed*, but not so much as to be useless, as, after being intensified with bichloride of mercury and ammonia, they yielded good, clear, and quick printing negatives. After developing the above negatives,

I came to the conclusion that two seconds each would have been the proper exposure to, have given with the stops employed and the light present, but the nature of subjects rendered this length of exposure impossible. Under similar conditions I shall use *f*-20 or *f*-16 stops for the future, and advise any one else to do the same.

But the foregoing experience shows the capabilities of both the developer and the plates employed. I find bromide of potassium has a very powerful effect as a restrainer with this developer, and tends to produce thin images; therefore, for normal exposures and general work, *one-eighth of a grain to each ounce of developing solution is ample*. For instantaneous or under-exposures, *no bromide* should be used. I may also add that the gentleman for whom the above were taken was very pleased with them all. All were developed with the same solution.

J. T. HACKETT.

CLOUDS.

[Manchester Amateur Photographic Society.]

To print a photograph of landscape or seascape with a purely white sky is so untrue to nature and so inartistic that nowadays it is a rarity except in the productions of the variest tyro, and we seldom see it perpetrated. That clouds are an improvement to most pictures is universally admitted, but we must not rush to the other extreme and use this power ignorantly or rashly; rather let us quietly consider how, by its means, we can convert our mere photographs into things of beauty.

SUNNING THE PRINT.

Most certainly the method of obtaining clouds on the same negative as the landscape is to be given the preference over all others; but if there is a clear blue sky you may ask, "How is this to be accomplished?" Well, unless you are using isochromatic plates your sky will most likely print white, and this, as I said before, is untrue to nature. You will have noticed the blue of the sky is darker towards the zenith and lighter when it approaches the horizon; therefore we must try and imitate this by what is technically termed "sunning the print," and is performed as follows:—Cover up the lower portion of the print, place it in the sunlight for a few seconds, shading it with a piece of cardboard, kept in movement so as to give a graduated tint on the sky—a very slight tint, indeed, is necessary, which can be gauged by keeping one corner covered by the thumb-nail.

USE OF THE LENS CAP.

Should well-marked clouds appear in the sky at the time of exposure, we should by all means try to obtain them on our negatives by giving the sky a shorter exposure than the landscape. Many ingenious mechanical means have been devised, but a simple method of taking off the cap is almost as effectual. The cap should be taken off by an upward motion and raised and lowered slowly; that is the whole procedure. There is one class of cloud subject which should invariably be taken with the landscape, or, better still, seascape. I refer to sunsets and sunrisings; the former will, perhaps, be more often attempted than the latter. There is nothing very difficult about it, although I am sorry to say it is rarely that we can secure a true impression of the scene. The principal points to be observed are to wait until the sun retires behind a suitable cloud, and to use a small proportion of pyro in the development.

HOW TO OBTAIN CLOUD NEGATIVES.

It is, however, not often that we can obtain clouds of a suitable quality on the same plate as the landscape, therefore we must have recourse to double printing, but before we do this we must get a number of cloud negatives—mind, I do not say one or two, for we should at least have over a dozen; if not, we shall most likely fall into that popular error of printing and perhaps exhibiting side by side two landscapes with the same cloud, an event that could scarcely happen in nature. It may be asked what kind of clouds we are to photograph, and I answer any kind and every kind we can get hold of—cumulus, stratified, wind-blown, mackerel sky, quiet sleepy-looking clouds; they will all come in useful at some time. Those clouds with the sun just off the angles of view are the easiest to obtain and, of course, the best illuminated. Use a plate of medium rapidity, by about *f*-22 stop and a slow shutter; use a normal developer, and, so as to get a clear, quick-printing negative, say pyro and soda.

Our friend, Mr. Shirley, advises iso. plates, which, he says, give greater detail, but personally I have found little advantage to be gained, though I may not have carried my experiments far enough.

When photographing clouds the camera should be level or nearly so, with a little of the landscape showing on the negative; it goes without saying that we must have a fairly clear view of the horizon, no poplars or factory chimneys reaching half way up the plate. To steer clear of this difficulty, some people point their cameras at an angle of say 45°, but the results are so obviously wrong that I will not stay now to point out the why and the wherefore. These people may be classed with those who gravely advise you to use your cloud negative upside down for a change.

It is necessary that every-one attempting cloud photography should be slightly inoculated with the Emersonian doctrine, for his clouds must not be quite sharp. For this reason, in a landscape we generally have the foreground and middle distance sharp, but the distance is out of focus, therefore it stands to reason that the more distant clouds should partake also of a fuzzy nature. I have some pictures by a well-known artist which show this defect very clearly. The foreground is sharp and the rest of the picture out of focus excepting the clouds, which are as sharp as the foreground.

PRINTING IN CLOUDS.

Having now got our stock of cloud negatives, we must consider next how to use them. There are several kinds of negatives to deal with, which for the purpose of this paper may be roughly divided into two classes: those giving a perfectly white sky, and those showing a decided tint. The former is the easiest to deal with, so we will take that first. Our initiatory proceeding is to take a print ready for toning in the usual way, then, choosing a suitable cloud negative, place the said print in contact in the printing frame; but, if we made no further preparation, the clouds would print on the landscape as well as the sky. To obviate this, we must take a piece of brown paper and roughly tear it to the shape of the sky-outline of the landscape, taking no notice of trees and suchlike dark objects that project into the sky. If the general objects in the distance are dark, then the clouds can overlap, but, if light, more care must be taken in the printing, and one or two thicknesses of tissue paper must project past the edge of the brown paper; this will soften the lower portion of the clouds; or another way is to keep the brown paper moving during printing.

Should the sky in our landscape negative be rather thin, we must resort to a little dodging, thus: place the back of the cloud negative we intend to use in contact with the film of the landscape, and, taking some Indian ink on the end of the finger, dab it over the high lights of the clouds, softening them off where necessary, then print as before described, but under tissue paper or in shade.

Another method is to keep the whole of the sky white by covering it while the landscape is printing, but this requires great care. It should also be remembered that on a hazy day, when we have an undefined horizon, clouds are not often seen in the lower portion of the sky, therefore should be lightly printed. Indeed, in any case do not be tempted to print the clouds too dark. Many a picture is overbalanced by this fault, and though dramatic in its effects, and so takes with the superficial observer, is ofttimes untrue to nature.

I have already mentioned that we must choose a suitable cloud negative, and much depends upon our judgment in making this choice.

LIGHTING, BALANCE, AND REFLECTIONS.

One of the first things we must consider is whether the lighting of the clouds is in the same direction as the landscape. Cloud negatives on films have here a distinct advantage, for they can be printed from either side. The next thing in importance is the artistic balancing of the picture, and in this we have in our hands a power for good or evil. Some few years ago I attempted to put before you as clearly as I could as to what was implied by a true balance of light and shade in a picture, and then went on to mention how clouds could be made to assist that important phase known as breadth in picture-making. To make this better understood, I will instance a photograph of a landscape taken on a bright summer's day. In the middle distance is a lake, and on the margin a little nearer at hand to the left is a cottage and a tree. Far away is a range of mountains clearly cut in the sunshine; but, unfortunately, the sky line is too uniform, and stretches across the landscape in a jagged line, cutting the picture almost in two, thus violating all canons of art. We now, by shading a portion of the landscape, print the mountains above the cottage somewhat darker, thus enlarging our mass of shade. We now take a cloud negative, which prints rather darker to the left than to the right, utilising it as before described, and it is now obvious that the scheme of light and shade we have been aiming for is accomplished, and will repay us for the trouble expended.

If our picture includes a sheet of still water with perfect reflections, it must be obvious that clouds wind-torn and jagged are unsuitable, but some well-rounded, quiet-looking clouds must be chosen and lightly printed for such a subject. If a portion of the sky is reflected in the water, we must then turn the cloud negative over and print also on the water, and whilst doing so covering up the sky. The film being separated by the thickness of the glass from the print just gives the right amount of fuzziness, but in carrying this out we must be careful

to have the true angle of reflection or the critics will be merciless to our faults.

It is scarcely within the scope of this paper (but might with advantage be individually considered) to do little more than mention the meteorological aspect of clouds. For our purpose the mere rudiments would be sufficient, though it would be rather trying to the temper if we were to send one of our pictures to an exhibition and call it an "Early Morning," the Judges awarding it the gold medal, and with a glow of pride and admiration we stand before it and listen to the adulation of others. Soon a rusty old savant comes along and gives a grunt of disgust, blurting out, "Why! the idiot has printed midday clouds into a morning picture," and we go home slowly and sadly, hoping that no one else has discovered the fault. But we can console ourselves with the fact that unless we have some scores of cloud negatives with notes as to the time of day and year, aspect of landscape, &c., it would be impossible to use them correctly. This being almost impracticable, we must do the best we can under the circumstances.

Different Forms of Clouds.

It might, perhaps, be advisable to mention the different forms of clouds, and for this purpose they may be classed under three heads, viz., the cumulus, the stratus, and the cirrus. The first is easily distinguished. It is often in grand rolling masses somewhat like mountains and is essentially a day cloud, forming after sunrise, and attains its maximum at noon. The word stratus indicates at once this form of cloud. It generally lies in low horizontal strata, forming in the evening and dispersing with the morning sun, therefore should only be used in morning and evening effects.

The cirrus cloud is of a fibrous nature and takes many forms; it is often called the mare's tail cloud, and is dependent on the state of the wind. These notes, perhaps, are sufficient to indicate the importance of studying the subject from a meteorological point of view.

J. W. Wade.

PHOTOGRAPHY IN SOUTH AFRICA.

Photography is decidedly overdone in South Africa; the large towns teem with studios, and prices are exceedingly low. Yet, in spite of this, it is astonishing how few amateurs there are, and how little enthusiasm exists amongst those few. This may probably be accounted for, however, by the fact that there is very little beautiful scenery here, that travelling is very expensive, and that every one is confoundedly lazy. Detective cameras are never seen, although there is a magnificent scope in that direction. The half-nude, picturesque Kaffir, the quaintly-clad Coolie, the childlike but wily Chinaman, all of whom, having a strong objection to courting death by coming under the evil eye of the camera (on the tripod), could easily be snapped off by a "detective." And the unsophisticated Dutchman can only be obtained in his picturesque state unawares; otherwise his great ambition, when photography is mentioned, is to go and wash himself, grease his hair, put on his store clothes, and stand like a Roman sentinel (with bell-bottomed unmentionables on), calm and cool, in front of a background representing a volcano in a particularly violent state of eruption; or sit in an easy attitude, with his hat on one side, and a hand spread out gracefully on each knee, in the best drawing-room of a palace, with all the studio accessories piled round. The Dutchman in his Sunday best is rather like a costermonger dressed for a bank holiday, the Dutchman at home, *i.e.*, on his waggon, with his slouch hat and long bullock-hide whip, is an interesting individual—photographically speaking. Walking by the side of his waggon, he can with the said whip pick out any one of his team—generally consisting of from sixteen to twenty oxen—which happens to be lagging. He has a name for each beast, and it is a significant fact that that one which is the most obstreperous, and consequently receives the largest number of lashes, nearly always goes under the name of "Rooi-neck"—an endearing term, signifying "Englishman."

There can be no doubt that the Dutch element is largely responsible for the very second-rate work which is turned out of most studios. The number of real artist portrait-photographers in South Africa could be counted on the fingers of one hand. The average photographer is quite content while he can keep his negatives pretty black and white, retouch up to an appalling degree, and give as much gloss on the finished photograph as possible. The following letter, which went the rounds of all the studios of a certain town, will show the tastes of the people:—

"Dear Sir,—I am coming to town shortly to have my portrait taken. I have heard that you are a good photographer. Please send with bearer a sample of the polish you use. Yours truly,—J. Van Dyke."

Take a three-quarter face, and your customer will turn the card round to look for his other ear; a three-quarter length, and he will inquire after the fate of his feet; let his face be anything but a chalky white, and he asks indignantly whether you take him for a half-cast. On the other hand, an elegant pose at a card-table, with one foot on an expensive footstool, and surroundings of flower pots and posing chairs, with a background depicting a shipwreck or a wild scene in Mashonaland, will bring joy to his heart.

Wages are fairly good. On the coast they run slightly higher than in England. In Kimberley and Johannesburg, and generally "up North," a good retoucher and operator can command from 3*l.* 10*s.* to 5*l.* per week; printers from 2*l.* 10*s.* to 3*l.* 10*s.* Expenses are in proportion. And the risk of being killed by the fine dust—which in Johannesburg carries off scores of new-comers—is also moderately high.

One year ago the lowest price in Johannesburg for one dozen cabinets was two guineas, and in most studios the charge was much higher. Now, one can be taken cabinet size—and not in the old-fashioned, common, ordinary, every-day manner—but by the "new patent, instantaneous process," for twenty shillings, and have a "beautifully finished life-size enlargement thrown in!"

To those thinking of emigrating from England to South Africa, it is most difficult to give advice. For good all-round men—a printer, operator, or retoucher, who understands only his own branch, must by all means stay at home—with a little capital, there are openings in many of the smaller towns which have no resident photographers; but it must be remembered that life out here is very different to what it is at home. The cold winter days—and very few of the houses contain fire grates—when one does not see a cloud for three or four months together, when the prints and negatives have consequently to go content with two changes of water; and when one's customers bring back the "permanent photographs," and demand an explanation as to "those yellow spots;" and the still more awful summer days, when the thermometer stands at 100° in the shade, and the airy mosquito and the vivacious flea become quite friendly, and tropical thunderstorms stroll round about twice a day; when the paper blisters as paper never blistered before, and the plates frill until one imagines that they are discontented with their condition, and have suddenly decided to become stripping films; when one learns that the coloured servants have acquired a taste for methylated spirits, and are executing a war-dance in the reception-room, or that a cyclone has carried off the roof of the studio and several of the best backgrounds—when such details as these happen, the English photographer is apt to seek out the coolest spot in the house, ponder profoundly, and whistle "Home, Sweet Home."

H. S. Ellerbeck.

ACCIDENT AND INTENTION.

[Holborn Camera Club.]

There is probably that in the experience of every picture-maker which will enable him to at once anticipate the general drift of my remarks to-night. My remarks—call it a paper if you will—shall be very brief because if they be worth anything they will then be easier remembered and because it will give us the more time to air any pet ideas which may arise, and talk over our individual good intentions (of course, none ever have any bad ones), and further discuss our accidents and failures.

The Honesty of Photographic Workers.

As my experience of photographic work and workers increases, I am bound to admit that my opinion as to their honesty (I refer to the *works*, not the workers) is not improved, and I don't think the workers often err on the side of excessive candour.

If every successful photograph were conscientiously accredited to happy chance—that is, to accident—or, on the other hand, to deliberate and premeditated intention, I wonder which list would be the longer! And, *vice versâ*, how rarely is a *bad* picture attributed to the *real* cause of its failure? How often the unreproachful instrument, the weather, the light, or "those wretched plates" bear the blame! Our own judgment, impatience, or skill, never! Oh dear, no! "Just like my luck, don't you know." Or, if it may be pointed out that the picture would be much better composed if such-and-such a feature were not quite so central, or ought to have been otherwise arranged, we get the answer, "Quite so. I know that; but, you see, I only wanted it as a memento of the place, and didn't trouble about the picture." "Didn't you? Well, then, you ought." And, oh, the deceit of it! for, if the truth were known, the camera was carefully set up, and on the ground-glass screen the subject was thought perfect and delightful, and not until the print was shown to some knowing one was the error noticed. And then there's the charming little bit of landscape, which somehow comes out all indistinct and fuzzy, no one knows why; and the critic's approval of the treatment is silently

received, as though it were due to one's artistic motive, instead of clumsiness in shaking the lens or stumbling over the camera-legs during exposure. We all know the sort of thing, from your President to the last newly elected member; an accident gives us a prize, and we unhesitatingly take the credit, and keep silence about the failures, and shirk the responsibility of them.

THE HAND CAMERA IN THE HANDS OF A TURNER OR CONSTABLE.

But all this is by way of introduction. I am not here to preach a sermon on morals, it is hardly my mission, for I fear I am so unorthodox as to believe that out of evil good may come, and hence I am seeking to show how, in the absence of good intention, or with the lack of ability to do the right thing, much good *may* arise if we only have the judgment and adroitness to turn it to account.

Now, I do not hesitate to say that if a Turner or a Constable were to arise from the grave and a hand camera placed in their hands, a brief half hour's instruction as to its use, and an open order on the nearest material dealer given them, that medals, awards, and general applause would be theirs within a few weeks. And why? Certainly not from their expert use of camera and apparatus, but from their ability (being artists) to judge when chance had given them a good result, and when a bad one, discrimination between what was worth preserving and what should be consigned to the waste heap.

In this idea of mine may be found an explanation of how some photographic workers so often score a success when, perhaps, a far more careful competitor fails. One has only to expose a sufficient number of plates to inevitably secure *some* successes, due, of course, to lucky accident. It is a question of percentage.

I remember a very well-known hand camera devotee telling me that he rarely got more than three or four good plates out of a dozen exposures, and whilst I could not help thinking that he must be as atrociously bad a photographer as he must be good customer to the plate makers, yet I could silently commend his discretion and strength of mind shown in sacrificing the bad, and only saving those children of accident, his good negatives.

MERE CHANCE.

Now, the question at issue is that if it be granted that most excellent things in photography are obtainable through mere chance—and whereas the results of chance cannot be admitted as art, what evidence is there on the other side which shall support the claims of photography as a deliberate means of artistic expression? And, further, what lesson may be drawn from the foregoing?

The occasional triumph of fortuitous circumstances in pictorial photography is undeniable, but I should not hesitate to assert that the instances of accidental success, which would not have been even greater if to the same circumstances artistic knowledge, ability, and judgment had been added, are so rare, so very rare, that they cannot be in any way accepted in the calculation. The measure of success may be so great that we are satisfied into leniency, and forbade to criticise too closely, and yet, as we study the work longer and think about it, somehow there is a something akin to soullessness which comes to the surface, and we gradually weary of it; we grow accustomed to it, and find, when the first impression has worn off, that it is wanting in that very power of endurance which is the best quality in a carefully thought out and satisfactorily produced picture. This may sound a little like dogmatism, claiming too much without definite proof. Well, I am not prepared to-night with any practical examples, but I would ask you to think this over, and apply it whenever opportunity offers. If you are content to get a moderate number of pictures which will win for you the admiration of your friends, set yourself the task of exposing a few gross of plates under fairly favourable circumstances, and you need have no fear of missing your desired end. But if you aspire higher, if your object is to attain to the best possible, then do not trust to the capriciousness of fortune and to chance; besides, what fearful disappointments will always await the photographer who depends on accident—for who has not learnt that if there be a bad negative in the batch it is sure to be that particularly favourite and much prized subject, whilst the thing we didn't care anything about turns out trumps?

OPPORTUNITY PLUS ACCIDENT.

I am convinced that opportunity *plus* accident, whilst it may furnish many successes, yet the same opportunity *plus* deliberate intention will, if the intention be the outcome of knowledge, yield a higher average of merit, even if the successes be fewer, and, moreover, we shall have failures which, because we know what we intended, and therefore know in what we have failed we should be able to turn to account and derive some useful lesson thereby.

In this direction two lines of thought suggest themselves to me which, for the sake of being definite, I will call "discrimination," or the knowing a good thing when we have it, and "application," by which I mean the faculty of turning the good to the best account.

In both of these cases a certain amount of art knowledge, instinctive or acquired, is necessary, and, important as is the *selection* of the subject, it is hardly more so than the exercise of the two above-named faculties, both of which, it may be noted, come into operation after the negative is made, and in a great measure irrespective of its qualities.

In the discrimination and recognition of the good, and in the method of making the most of it, the artistic ability of the photographer is, perhaps, first discernible, and his individuality most displayed.

At one time and another it has been my lot, I might almost say my misfortune, to have passed through my hands parcels of photographs made by the most absolute tyros; photographs taken, perhaps, during a summer holiday, of every description of subject from every conceivable situation, from the shore, from shipboard, mountain summit, or river bank, and from amongst a collection of less than ordinary merit, there now and again appears a gem which, from the rough and imperfect manner of its printing or some such character, has evidently not been appreciated by its author.

Has it not occurred within our own experience that, on looking through a batch of old prints which we had long ago thrust on one side as of little importance, we have been surprised to find some picture which, in the light of greater experience and knowledge, seems wholly satisfactory. Have we not at some time found that some friend of culture or artistic tendency has discovered, from amongst a bundle of discarded photographs, some one which he points out as a desirable and satisfactory picture. We had never noticed it before, but now that our attention is drawn thus to its merits, we are astonished that we could have overlooked it.

AN "INABILITY TO RECOGNISE THE GOOD."

How can we account for this singular inability to recognise the good? Is it because, when we first made the print and then cast it aside, we were not in a mood or frame of mind responsive to its particular sentiment? or is it because we are deficient in a knowledge of Nature, and the eye is not fully educated to perceive when a poetic aspect of Nature is transferred or reproduced in the picture? In either case we have an accidental success, and if we can decide the cause of our failing to recognise it, and then cultivate our senses and faculties accordingly, our accident will have become a source of education to us, and will enable us, not only to do, but to surpass by intention, what before was effected through chance.

This would be one phase of application, but what I had in mind was rather the preservation of an unsatisfactory print by one process in order that we may ascertain what better can be done with the subject by a different method. Let the unsatisfactory print be an object of careful study, and endeavour to draw from it an explanation of its failure. Is it the characteristic of the paper used? is it that the clouds included are not in harmony with the sentiment of the scene? is it printed too dark to suggest sunshine, or too light, or too flat, for twilight? Are the relative tones of foreground and distance incorrect, or some detail too strong or too weak, one false note in the chord producing a discord. By dodging, by shading, by cutting down, try to correct the evil, reluctant to the last to abandon it. Thus out of our failure, also an accident, we may, by deliberation and intention, come to a successful issue.

I know not if my remarks have been at all suggestive, but the recollection of certain instances in my own brief experience, when premeditated results being built upon a foundation of accidents have, in the end, proved very satisfactory, prompted the hope that these notes might not be without some indirect use. Before resuming my seat, however, I should like you to remember the following few sentences (in reality the skeleton of this paper):—Conscientious admission to oneself; submit results to experts, and endeavour to find the good in every picture; chance pictures not as enduring as premeditated ones; that, where luck has done much, knowledge would have done more; take a hint from an imperfect picture and improve upon it; do not discard a picture because at once it appears undeserving, put it by and study it another time, there may be something in it you had not suspected. A painter's parallel: the painter gets a suggestion, a hint, from an almost unintentional stroke of his brush, a passing shade, or what not; it is an accident, but he pushes it further, he builds upon it, and out of accident that was kind grows a perfect work which is not the result of blind chance, but of definite aim.

A. HORSLEY HINTON.

ABERDEEN PHOTOGRAPHIC EXHIBITION.

(In connexion with the "Scottish Homes Industries Association.")

THIS was, we believe, the first amateur photographic exhibition that has been held in Aberdeen, and, taking into consideration the short time

that they have been advertising and getting the pictures together, it turned out highly successful.

The time and place were propitious for a photographic show—for the Exhibition, of which this was a section, was opened by the Princesses Beatrice and Louise, and the streets were gay with decorations in honour of the Royal visit to the city, and visitors came to the city in thousands.

Great credit is due to Dr. McKenzie Davidson and Miss Perrie, for the very able manner by which they overcame so many difficulties in connexion with this photographic section, and on the day before the opening to be in a position to present to the press, &c., one of the most unique and charming of exhibitions, though small.

Prizes were given in amateur classes only, but in the non-competitive sections many high class and beautiful productions were sent in by professionals.

The judges were—Mr. George Mason, Glasgow; and Mr. James Ewing Crown-street, Aberdeen. The following is the list of awards:—

Class I.—Landscape—Whole Plate and over—Medal, Mr. John Milne, 4, Devanha-terrace, Aberdeen; highly commended, Mr. W. F. Wilson, Honolulu; commended, Mr. James Bowman, jun., The Square, Huntly.

Class II.—Landscape—Half Plate or under—Medal, Mrs. Greig, Cobairdy, Huntly; highly commended, Miss Emily C. Pirie, Watertonhouse, Auchmill; commended, Mr. V. C. Baird, 3, Camperdown-place, Broughty Ferry.

Class III.—Portraiture and Figure Study—Medal, Mrs. Gordon, Ellon Castle, Aberdeenshire; highly commended, Mrs. Greig, Cobairdy, Huntly; commended, Mr. George Muirhead, Mains of Haddo, Aberdeenshire.

Class IV.—Marine Clouds—Medal, Mrs. Norrie, Cross-street, Fraserburgh; highly commended, Mr. John Milne, 4, Devanha-terrace, Aberdeen; commended, Mr. James Bowman, jun., The Square, Huntly.

Class V.—Hand Camera—No awards.

Class VI.—Enlargements—C. W. Moffat, 7, Queen's-gardens.

Class VII.—Lantern Slides—Medal, Professor Finlay, Aberdeen; highly commended, Mr. Wm. F. Borthwick, 25, View-terrace, Aberdeen; commended, Mr. G. Brodie, 2, Powis-terrace, Aberdeen.

Class VIII.—Stereoscopic Slides—Medal, Mr. R. Murray, North of Scotland Bank, Dundee.

In the non-competitive classes Messrs. G. W. Wilson & Co.'s show of lantern slides and transparencies for the stereoscope was highly representative of their work, showing, as it does, the best class of work at its best.

They also showed in larger photographs—in carbon and platinotype—many specimens, and all of a high order of merit, notable amongst these, *Purple and Gold*, *Among the Breakers*, and *Sunshine and Shower*.

Messrs. Valentine, of Dundee, showed large platinum pictures of Norway scenery which attracted universal attention.

Mr. James Ewing's carbon enlargement life-sized bust of Captain Reid, is an artistically finished piece of work, and his case of 12 × 10 platinum groups show careful manipulation and artistic posing.

Messrs. Morgan make a large show, embracing, as it does, work from life-sized busts down to cabinet size, a well-arranged selection of pictures that speaks highly for the manipulative skill of the exhibitors.

Mr. McMahon, Mr. Geering, and Mr. Middleton are represented on the walls by excellent work.

The Exhibition was visited by the Princesses Beatrice and Louise, and Lady Aberdeen, who expressed themselves highly pleased with the photographic display.

Our Editorial Table.

The "Ilford Year-book" for 1893.

An elegant little pocket-book, in limp morocco covers and gilt edges The wisdom of the Britannia Works Company is shown by their giving a chief place in their *Year-book* to a diary, for which there are three days to a page. There is a judicious review of the doings of the past year by Mr. John Howson, in which he takes a rapid and comprehensive survey of most of what has transpired during these twelve months. There is also a variety of other useful information in this handsome diary.

Trade Catalogues.—Those before us include, first, that of Mr. John Harmer, Littlehampton, whose list is devoted mainly to enlargements, in carbon and otherwise. Mr. Harmer's speciality is the preparation of negatives for any of the processes by which enlargements are printed: and, secondly, that of the Thornton-Pickard Company, whose productions are now too well known to need specifying. We perceive that the firm has opened a new factory and offices at Altrincham, near Manchester.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.

The fourth meeting of the delegates held on October 11, at the rooms of the Photographic Society of Great Britain, Mr. Mackie (North London Photographic Society) in the chair.—The Chairman announced the business of the evening to be the arrangement of a winter programme, but there was also upon the agenda "the appointment of a working committee." Mr. P. Everitt (London and Provincial Photographic Association) inquired if that had not been arranged at the last meeting, and the extract from the minutes was read, recording that it was deferred. After some remarks by the Chairman, Mr. Marchant (North Middlesex Photographic Society), and Mr. Golding (Holborn Camera Club), it was decided that the matter be deferred. The Assistant Secretary announced that a set of slides for circulation had been received from the Leeds Photographic Society, and sets promised from the Hull, Lancaster, and Madras Societies. The North Middlesex Society had also offered for circulation papers on *Gelatino-chloride-of-silver Paper and its Manipulation*, by Mr. J. C. S. Mummery, and *Notes on Landscape*, by Mr. Pither. Major Bruno (Southsea Photographic Society) stated that he was authorised on behalf of his Society to offer a set of slides; and the offers of slides were accepted with thanks. Mr. Everitt suggested a course of lectures on photo-mechanical processes, and, after some remarks by the Chairman, Messrs. Clifton (Photographic Club) and Marchant, it was resolved that arrangements be made for a series of technical lectures to be held, if possible, at 50, Great Russell-street, on some branch of photo-mechanical printing, and that a committee of three members be appointed to make inquiries as to the best means of carrying it out. The constitution of the Committee was then discussed, and the meeting adjourned until Friday, the 14th inst.

Adjourned meeting of delegates held at 50, Great Russell-street, Friday, October 14, Mr. W. Bedford (Photographic Society of Great Britain) in the chair.—Mr. Marchant called attention to the fact that there were no rules as to the calling of meetings of delegates, and thought the scheme ought to be put on a business footing, and suggested the appointment of a Chairman with power to call meetings and to be responsible for the agenda. It was proposed by Mr. Everitt, seconded by Mr. Marchant, and carried unanimously, that Mr. Bedford be appointed Chairman, with power to call meetings and arrange the business. The Chairman thanked the meeting for such an expression of confidence, and called on the delegates to resume the discussion left unsettled at the previous meeting, viz., the appointment of the committee to carry out the proposition as to technical lectures. Mr. Warnerke (Photographic Society of Great Britain) stated that he felt sure the parent Society would regard this proposition in a sympathetic manner, and after some remarks by the Chairman, Messrs. Everitt, Mackie, Cox (North Middlesex Photographic Society), and Clifton, it was decided that the committee consist of the Chairman (*ex-officio*), Messrs. Warnerke, Marchant, and Everitt. The Chairman referred to a circular that had been received from the International Union of Photography, the object and present position of which Mr. Warnerke explained. A question was raised as to whether an Affiliation of Societies could join such a union, and, after some remarks by the Chairman and Mr. Cox, Mr. Warnerke promised to obtain further particulars. The Chairman asked if it were possible to obtain for circulation the lantern slides sent in to the Pall Mall Exhibition, and the Assistant Secretary was instructed to see what could be done. Mr. Zachariasen (Putney Photographic Society) proposed that tickets should be printed to be issued to all members of affiliated Societies, to act as proof to the fact that the holders were members of an affiliated Society, but, after a discussion in which Messrs. Mackie, Clifton, and the Chairman joined, it was determined to obtain a stamp, and that the Secretaries of the Societies should be invited to send their ordinary members' tickets to the Assistant Secretary to be stamped. The Assistant Secretary announced that at the present moment the papers, &c., at the disposal of the Societies were as follows:—1. *Photogravure*, by Mr. A. Dawson, with examples by various firms. 2. *A Proposal for a National Photographic Record and Survey*, by Mr. W. Jerome Harrison, F.G.S., with examples by the Birmingham Photographic Society. 3. *Photography applied to the Detection of Crime*, by Dr. Paul Jeserich, illustrated by lantern slides. 4. Set of sixty Indian and Colonial lantern slides. 5. Set of seventy-one lantern slides of Yorkshire scenery by the Leeds Photographic Society. 6. Set of lantern slides by the Hull Photographic Society. 7. *Gelatino-chloride-of-silver-Paper and its Manipulation*, by Mr. J. C. S. Mummery. 8. *Notes on Landscape*, by Mr. F. L. Pither. 9. There was also an offer, of which several Societies have availed themselves, by Mr. W. E. Debenham, to demonstrate either *Transparencies by the Carbon Process* or *Collodio-bromide*, and the meeting adjourned.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 18,211.—"Improvements in Optical Lanterns." A. C. Jackson.—*Dated October* 12, 1892.

No. 18,230.—"Improved Mode of Fixing a Photographic Camera to Stand." H. L. Wright.—*Dated October* 12, 1892.

No. 18,264.—"Improvements in Photographic Cameras." R. HARTLAND.—*Dated October* 12, 1892.

No. 18,265.—"An Improved Photographic Shutter." R. HARTLAND.—*Dated October* 12, 1892.

No. 18,315.—"Improvements in Magic or Optical Lantern Slide Carriers." C. C. VEVERS.—*Dated October* 13, 1892.

No. 18,382.—"Improvements in Photographic Apparatus." W. A. EDWARDS.—*Dated October* 13, 1892.

No. 18,468.—"Improvements in Photographic Cameras and Mechanism for the same." W. SNELGROVE and F. CARVER.—*Dated October* 15, 1892.

PATENTS COMPLETED.

AN IMPROVED HAND CAMERA.

No. 5132. ARTHUR CHARLES SMITH and ALBERT ARTHUR SMITH, both of 258, Albert-road, Peckham.—*September* 10, 1892.

A CAMERA made according to this invention consists of an outer case of wood or metal, in one end of which is the lens, and in this case a reservoir to contain the sensitised plates is formed, consisting of an upper and a lower chamber, grooved or otherwise.

The unexposed plates are fitted with suitable sheaths, and stored vertically in the upper part of the magazine, in the space between the plane containing the focus of the lens and the front of the camera. Exposure takes place in the lower part of the camera, and the plates are dropped, one by one, through a narrow opening, into the required position.

When the top half of the magazine is full of plates, the back of the lower half is in a line with the opening or slot through which the plates fall. As the plates pass into the lower half of the magazine, the whole reservoir is caused to move backwards, and the lower chamber increases in depth while the upper chamber decreases, until all the plates are in the lower part, when the end of the upper part of the magazine nearest the front of the camera takes its place over the slot.

The plates are supported in the upper chamber by a loose floor which, when a plate is required, is slid back so as to form a narrow opening large enough for a plate to drop through into the lower part of the camera.

After the plate has fallen, the opening is closed by replacing the sliding floor, and the plate is pushed against the back of the lower chamber; the pressure is continued, and the magazine, containing the whole of the plates, recedes from the lens a distance equal to the thickness of the plate.

An efficient method of releasing the unexposed plate, pushing it against the back of the lower chamber, and giving motion to the magazine, is provided by the use of a frame which slides in the lower part of the camera. This frame is really a small trunk open at both ends, and is so placed that the light may pass through it from the lens, and act upon the sensitised plate.

The top of this frame serves as the loose floor to the upper chamber, and one end is utilised to press against the plate opposite the lens. The use of the frame renders the changing of the plates a very simple operation. By means of an attachment on the outside of the camera, the sliding frame is moved forward, and the opening is made for the plate to drop through; and by bringing the frame back to its normal position the plate is pressed into the correct position for exposing, and the magazine travels backwards.

To ensure each unexposed plate falling in front of the exposed ones, the bottom edges of the plates in the upper chamber are arranged a little below the top edges of those in the lower half of the magazine.

Instead of storing the plates vertically as described, they may be placed horizontally in the upper chamber, and the opening arranged so that the plates may swing into the vertical plane opposite the lens. In this case the sheaths containing the plates have trunnions attached to the upper corners, and these trunnions are placed in vertical grooves formed in the sides of one end of the chamber. The magazine is made to travel in a manner similar to that adopted when all the plates are disposed vertically, namely, by pushing it along the thickness of a plate at a time.

To indicate the number of the plate about to be exposed, a series of numerals is placed on the side of the magazine, and these figures can be seen through a small aperture in the side of the camera.

A shutter, which works behind the lens, is provided consisting of a piece of metal, or wood, containing the necessary aperture, fixed at right angles to the outer edge of a sector of a circular plate so centred that, by means of a rod or rods, the apertnre may be moved across the lens from side to side.

AN IMPROVED DEVELOPING TRAY OR DISH FOR PHOTOGRAPHIC PURPOSES.

No. 10,023. ANDRÉ DESBOUTIN, 70, Thurlow-hill, West Dulwich, London.—*September* 10, 1892.

THIS invention relates to the novel construction of a tray or dish for developing photographic plates or films, whereby I am enabled to dispense with the use of a special dark room.

In carrying out the said invention I provide a dish proper of *papier mâché* or other suitable material, and having a spout. This dish proper is provided with a closely fitting lid having in it a sheet of glass of a non-actinic colour—say yellow—and in the bottom of the dish proper another sheet of glass, also of non-actinic colour—say red—is inserted. Across the part of the dish having the spout I form a screen, which serves to prevent any light from entering the dish or tray through the aperture between the spout and the dish.

IMPROVED COMBINED SUBSTANCES FOR THE DEVELOPMENT OF PHOTOGRAPHIC IMAGES.

No. 14,542. JULIUS HAUFF, Feuerbach, near Stuttgart, Germany.—*September* 17, 1892.

IN completing experiments with the series of the diamido compounds of phenol and cresols, for the purpose of testing their utility in the development of photographs on halogen-gelatino-silver plates and on halogen-gelatino silver paper, it has been found that, besides the o-p-diamido-phenol, the o-p-diamido-o-cresol, and o-p-diamido-metacresol, can be used as a developing means in the same manner as the first-mentioned compound. Likewise can these two new developing substances bring out the latent image in combination with sulphites of the alkalies, or sulphite of ammonium, without the presence of free alkalies, or of carbonates of the alkalies, while, in the same manner as for diamido-phenol, their developing power exceeds that of the other developing means.

As an example, I may use—

100 cub. cent. of water.
0·5 gramme of diamido-cresol.
5 grammes of the crystallised sulphite of an alkali.

It may be remarked that, by increasing the addition of the sulphite, the reducing power is likewise increased, while this power can be decreased by the addition of acids (preferably of sulphurous acid), or of bromides or chlorides of the alkalies, so that the manner of using the developing substance for more or less exposed plates becomes obvious. Instead of neutral sulphites, acid sulphites may be used when, at the same time, all or only a portion of the free acid is neutralised by means of carbonates or bicarbonates, the recipe being thus capable of generalisation.

Having now particularly described and ascertained the nature of this invention, and in what manner the same is to be performed, I declare that what I claim is:—The employment of o-p-diamido-o-cresol and of o-p-diamido-m-cresol, in combination with soluble sulphites (such as sulphite of soda, sulphite of potash, sulphite of ammonium, sulphite of lithium), for developing photographic images on layers containing halogen silver.

IMPROVEMENTS IN APPARATUS FOR WASHING PHOTOGRAPHIC PRINTS AND NEGATIVES.

No. 19,706. HAROLD HOLCROFT, Ettingshall Foundry, Wolverhampton, Staffordshire.—*September* 17, 1892.

THIS invention has for its object improvements in apparatus for washing photographic prints and negatives, more especially for the purpose of ensuring an equal flow of water in a given direction only over the surfaces of the different prints or negatives, and ensuring a thorough constant change of the water in such manner that no portion of it passes twice along the surface of a print or negative, and of securely preventing in a convenient manner prints from coming in contact with one another or being doubled up or otherwise creased or injured by the flow.

Apparatus constructed according to this invention comprises, as an important feature, a carrier or vessel into which the prints or negatives (or prints and negatives) are placed, and through which a constant stream of water passes in one direction only, and consists, in its preferred form, primarily, of such carrier and of a rectangular water cistern or washing vessel, which may be open-topped, within which the carrier, formed as a box or shell open at each end, may be inserted. The carrier is of a width which allows of it fitting easily down between the sides of the cistern, and of a depth somewhat less than the cistern, so that when placed therein it is covered with water; and the carrier is shorter than the cistern, so that when placed therein a space may be left at each end between itself and the end of the cistern. The sides of the carrier are provided with narrow ledges, or with corrugations or other guides, to receive horizontal trays or slides upon which the prints or negatives to be washed are placed. These trays are each formed of a frame strung across in both directions for the purpose of carrying the prints or negatives, or having netting stretched across for such purpose; and it is preferred that the stringing or netting shall be of such material, or be so coated or otherwise prepared, that it will resist the action of moisture and of chemicals used in the photographic process. Each print or negative to be washed is laid upon a separate tray, and the trays are pushed endways horizontally into the carrier, each upon a pair of ledges or guides. Water is allowed to drip or run from a tap into one end of the cistern, and flows through the carrier and consequently along the surfaces of the prints or negatives therein, and out therefrom into the other end of the cistern, from whence it passes off by an overflow. It is preferred to fix a transverse wall across the top of the carrier to prevent any flow of water over the top thereof. As the flow of water through the carrier might tend to wash the prints out of the trays, a number of vertical bars of wire, sheet metal fixed edgeways to the line of flow, or other substance, pass across the outflow end of the carrier; and, to prevent any risk of the edges of the prints getting between such bars and the edges of the trays, holes, corresponding in position with the bars, are notched in the edges of the trays, and the trays are pushed up to cause the bars to be within the notches, which securely prevents the edges of the prints from getting over the edges of the trays. The bars may be set somewhat inwards from the end of the carrier, so that when the trays are pushed up in the manner described their edges will not come beyond the end thereof.

As the water flows entirely in one direction, and cannot, after having passed through the carrier, return into it but must pass away by the overflow, there is a constant and thorough change of the water passing through the carrier, no portion of it passing twice along the surface of a print or negative.

If desired, in order to more completely ensure an equal flow of water over the surface of each print or negative, the water may pass into the carrier through a division having holes pierced therethrough at heights corresponding to the spaces divided off by the ledges or other guides, and the water may pass out from the carrier through a similarly perforated division.

Instead of forming ledges or other guides to receive the trays, the trays themselves may be formed, each with turned-up edges, to carry the next tray above it.

The following are the claims:—1. Apparatus for washing photographic prints and negatives (or prints or negatives) in which trays which carry the prints and negatives (or prints or negatives) are carried in position one above another within a washing cistern (having a space at each end unoccupied by the trays) in such a manner that, with a proper depth of water (which may be controlled as desired at the outflow end), a constant supply to one end of such cistern will all, or substantially all, pass in a continuous stream once only through the portion of the cistern occupied by the trays, and thence into the other end of the cistern and away through an overflow, substantially as described. 2. In apparatus for washing photographic prints and negatives (or

prints or negatives), the combination of a carrier with a cistern, within which it is a fairly good fit widthways, in order that, with a proper depth of water in the cistern (which may be controlled as desired at the overflow end), a constant supply of water to one end thereof will all, or substantially all, pass in a continuous stream once only through the carrier into the other end of the cistern, and thence away through an overflow, substantially as described. 3. In apparatus for washing photographic prints and negatives (or prints or negatives), the combination of a horizontal carrier with a horizontal cistern provided with a suitable overflow at one end, said carrier being a fairly good fit widthways within the cistern, but shorter than it, so as to leave a space at each end between itself and the end of the cistern, and being fitted with trays (more especially for prints, but usable also for negatives) or with ledges or grooves for the negatives, or with both trays and ledges or grooves, substantially as described for the purpose set forth. 4. In apparatus for washing photographic prints and negatives (or prints or negatives) in which a number of horizontal trays are carried within a carrier, forming such trays each with portions projecting outwards from the plane thereof so that they may rest one upon another, substantially as described. 5. In apparatus for washing photographic prints, in which the prints are carried upon trays placed within a carrier, through which a stream of water is caused to flow, the employment, at the outflow end of such carrier, of bars which prevent the prints being washed out thereof, substantially as described. 6. In apparatus for washing photographic prints, in which the prints are carried upon trays placed within a carrier, through which a stream of water is caused to flow, the employment at the outflow end of such carrier of bars, which prevent the prints being washed out thereof, in combination with notches in the edges of the trays, so that when the trays are placed in position the bars are within the notches, and the edges of the prints are securely prevented from getting over between the bars and the edges of the trays, substantially as described. 7. Apparatus for washing photographic prints and negatives, substantially as described with reference to the drawings herewith, and the modified arrangements thereof, substantially as described.

Improvements relating to the Adjustment of Photographic Lenses.

No. 19842. Gerhard Hodenstock, Optisch-occultisches Institut, Munich, Germany.—*September* 17, 1892.

This invention relates to the adjustment of photographic lenses, and its purpose is to allow the lens to be adjusted for the actinic or chemical focus as well as for the visual or optical focus.

The lens tube or tube carrying the lens or combination of lenses is movable back and forth in a socket, which may be fixed when the lens does not require optical focal adjustment, or movable when the focal position varies according to the distance of the object photographed, and the ground glass or sensitive surface is not movable to and from the lens.

The movement of the lens tube in its socket aforesaid is limited by any suitable device, such as a pin and slot, the latter plain or provided with a right-angled recess or recesses, or a spring, or spring clip or clips, or detent or detents, or simply with marks, so that the lens tube may be easily shifted from its position for optical focus to that for actinic focus, or *vice versâ*, the object being to enable the lens to be adjusted to give a sharp optical definition on the receiving screen, and afterwards be shifted the exact amount to bring it into focal adjustment for a sharp actinic or chemical image.

The claim is:—A lens tube having a limited or measured free movement longitudinally equivalent to the distance between the optical and actinic foci for its adjustment in the manner described.

The Use of Aromatic Amido Compounds and of Derivatives of Phenol for the Development of Photographic Images.

No. 20,690. Julius Hauff, Feuerbach near Stuttgart, Germany.—*September* 17, 1892.

This invention has for its object the use for developing latent photographic images or views of substituted amido-phenols which have the property of dissolving readily in carbonates of the alkalies. These compounds belong to the "glycine" class, and are produced by replacing an atom of hydrogen in the group NH_2 of the amido-phenol by an acetic acid residuum. The typical formula for these compounds is:—

$$C_6H_{3-4}OH.NH.CH_2COOH.$$

These compounds are the glycines of the following amido-phenols:—

1. p-amido-phenol,
2. o-amido-m-cresol,
3. m-amido-o-cresol,
4. m-amido-(v-) m-xylenol,
5. m-amido p-xylenol,
6. o-amido-(v-) o-xylenol,
7. o-amido-(s) m-xylenol.

These compounds are used in solution with sulphites and carbonates of the alkalies for the purpose of developing latent photographic images or views.

For instance, I dissolve in one hundred c.c. of water, four and a half grammes of crystallised sulphite of soda, one and a half grammes of glycine, and two and a half grammes of potash, this compound forming a developing means particularly suitable for the development of landscapes. For portrait work and the like, the solution may be concentrated or further diluted, according to the temporary conditions as to light, plates, &c.

Having now particularly described and ascertained the nature of this invention, and in what manner the same is to be performed, I declare that what I claim is:—The use of the glycines of the following amido-phenols for the development of the photographic views or images in layers containing halogen silver:

1. p-amido-phenol,
2. o-amido-m-cresol,
3. m-amido-o-cresol,
4. m-amido-(v-) m-xylenol,
5. m-amido-p-xylenol,
6. o-amido-(v-) o-xylenol,
7. o-amido-(s-) m-xylenol.

An Improvement in Hand Cameras.

No. 14,274. Joseph Haigh, 77A, Dale-street, and 95, Lord-street, Liverpool.—*September* 24, 1892.

A method of carrying for exposure a number of sensitised photographic plates or films, by means of a frame working on an axle or pivots.

The axle is pivoted at each end, and revolves by means of a handle attached to one of the pivots, the handle being outside the camera.

Fixed to the axle at right angles to each other are four carriers, having catches top and bottom of each side for the purpose of holding plates or films to be exposed in rotation or otherwise at the will of the operator. The slides or plates when in a horizontal position are protected from light by sheets of a flexible material impervious to light, fastened to axle between each carrier.

Improvements in Portable Photographic Cameras.

No. 20,177. John Henry Skinner, East Dereham, Norfolk.—*September* 24, 1892.

This invention has for its object to produce a photographic camera wherein space is economised, and which is more easily and quickly manipulated than those hitherto in use.

According to this invention I make the camera with a fixed box front, having two wings hinged to the sides of the front, which fold down over the back when the camera is closed. These wings are provided with grooves or channels, which serve as guides, in which work pins or pegs secured to or carried by the camera end. The extremities of the said grooves or channels are recessed, and when the inner or bellows body is drawn out the pins or pegs are caused to enter these recesses. This may be effected by making the pegs or pins spring-actuated, or the wings may be hinge-bound to the sides of the camera front—that is to say, set on their hinges in such a manner as to open rather less than ninety degrees, so that when fully opened the wings are not quite parallel, but are slightly inclined towards each other. By this construction, when the inner or bellows body is drawn out, the pins or pegs on the end of the camera ride up the grooves, and entering the terminal recesses automatically secure the camera in its "opened out" position. The same result may be effected by the use of springs, catches, or their equivalents, in substitution for the pins or pegs hereinbefore referred to.

Another feature of my invention is to provide the camera with a double swing back. This is effected by providing the camera end with one central pin or peg at each side, riding in a corresponding slot in each wing, so that when the camera is opened out the end thereof turns on these pins or pegs as on axis, the axial line being always in focus, no matter in what position the camera back may be placed. When the desired position is obtained, the end of the camera can be fixed in this position by a set screw passing through one of the wings, or by equivalent means.

I economise space in the construction of my cameras by making the camera back, or double dark slide, to slide over the end of the camera, instead of sliding it into the end, as at present made. I am thu enabled to produce a camera of small size which will give as good practical resnlts as one considerably larger when made by the ordinary method of construction. In cameras of the kind known as portable photographic cameras economy of space is of great importance. In carrying out this part of my invention I secure a metal plate on the edge of each side of the double dark slide and turned inwards towards the centre to form grooves. On the edges of the camera end I cut away the wood, and secure a metal plate on each edge, so as to form a rabbet, which enters the corresponding groove in the camera back or double dark slide when the same is passed endways over the camera end.

The glass frame is, of course, made in the same manner as the double dark slide, so as to fit on to the camera end.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
October 24	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 24	Gloucestershire	
,, 24	Lantern Society	20, Hanover-square.
,, 24	North Middlesex	Jubilee Hall, Hornsey-road.
,, 24	Richmond	Greyhound Hotel.
,, 25	Great Britain (Technical)	50, Great Russell-st., Bloomsbury.
,, 25	Lancaster	Storey Institute, Lancaster.
,, 25	Leith Amateur	
,, 25	Warrington	Museum, Bold street, Warrington.
,, 26	Bath	Roy. Lit. & Sc. Inst., Terrace-walks.
,, 26	Barnsley	Bank Chambers, Hargreaves-street.
,, 26	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 27	Birmingham	Lecture Room, Midland Institute.
,, 27	Camera Club	Charing-cross-road, W.C.
,, 27	Hackney	206, Mare-street, Hackney.
,, 27	Halifax Photo. Club	Mechanics' Hall, Halifax.
,, 27	Hull	Royal Institution, Hull.
,, 27	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 27	Liverpool Amateur	Crescent Chambers, 3, Lord-street.
,, 27	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 27	Oldham (Annual)	The Lyceum, Union-street, Oldham.
,, 28	Cardiff	
,, 28	Holborn	
,, 28	Maidstone	"The Palace," Maidstone.
,, 28	Swansea (Annual)	Tenby Hotel, Swansea.
,, 28 ..	West London	Chiswick School of Art, Chiswick.
,, 29	Putney	High-street, Putney.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 13,—Mr. W. E. Debenham in the chair.

Mr. Ripley was elected a member.

Mr. WARNERKE, in reply to a question as to the best means of working and breaking up large bulks of emulsions, gave a sketch of the arrangement he employed, which consisted of a cylinder with a mesh (five to one inch) through which the set emulsion was forced into another vessel. Mr. Warnerke introduced to the meeting M. F. M. Richard of Paris.

THE "PHOTO-JUMELLE" FIELD OR OPERA GLASS CAMERA.

M. Richard exhibited a small camera which looked like an ordinary opera glass. Twelve plates or thirty films in sheaths were available for exposure. In focussing the image, the latter could be seen on a ground glass projecting from the side. Negatives, transparencies, and prints produced by the aid of the "Jumelle" were shown. The size of the plate or film was $2\frac{1}{4} \times 1\frac{1}{2}$. For enlarging purposes M. Richard showed an enlarging camera in which the negative was placed in a tube open to the source of light, a sheath being provided for holding the paper or plate to form the enlarged picture, the camera being of the solid body variety. An exposure of two minutes to daylight, using Eastman paper, was necessary. A special printing frame, a changing back, a frame for affixing the opera-glass camera to a stand, and other items were included in the exhibit, price of which was said to be 175 francs.

THE "FLYING" LANTERN SLIDE CARRIER.

Mr. T. E. Freshwater exhibited the "Flying" Carrier or Lantern Slide Holder. In use, having placed a slide in one end of the camera, it is pushed forward into the lantern as usual, and when the image is on the screen the second slide is inserted into the other end and pushed in the opposite direction; the first is then automatically removed, and, the second being shown on the screen, the third is inserted, and so on. A movable block which passes across the screen between the two slides acts as a dissolver. The Carrier is self-centreing, and no light can penetrate through either sides of the frame.

These rapid movements are principally effected by means of a roller inside the Carrier, which aids the slides in travelling from one side to the other.

RETOUCHING.

Mr. REDMOND BARRETT, in discoursing on this subject, said he would not discuss the worthiness or unworthiness of retouching, but he might point out that, from the earliest times, it had managed to hold a position among photographers which seemed unshaken at the present day. Overworking, however, had been introduced, and this had gradually injured the better class of work among retouching. He thought that retouching, judiciously carried out, might be considered to benefit portraiture. For example, ladies' portraits were seldom satisfactory in the natural state, consequently a little retouching was always more or less advisable; and even many gentlemen did not care to present to friends their portraits which had not received the aid of the retoucher. As regards retouching itself, he did not advocate any special touch. For himself, all he could say was, that if he saw a blemish on a negative he took it out. A great number of people preferred cross hatching, but in many negatives it was absolutely impossible to render faithfully the likeness. He had many negatives through his hands in which the likeness could not be preserved by cross hatching. If the negative were delicately lighted, cross hatching must undo the work of the operator. The retoucher, he thought, should be as free as the artist when painting a picture who forms an idea in his own mind as to the effect he wishes to produce. So in like manner the retoucher should go for effects, and get them with as small an amount of work as possible. The more lead one put on a negative the more likely to be the loss of likeness. The retoucher, however, had to work according to the ideas of the photographer. Referring to a number of untouched and touched specimens he had brought with him, Mr. Barrett said that the latter, were ordinary work such as were acceptable to the general public, and drew attention to one (a square head) in which the facilities for spoiling by the retoucher were, he thought, very great. In retouching this, he claimed to have removed defects without destroying the likeness or unnecessarily rounding the head. He appreciated thoroughly those photographers who insisted upon the limitations of retouching. Alluding to the alterations which the retoucher sometimes has to make on a negative, he said that, now and then, by cutting away portions of the waists of ladies of uncertain age, unsuccessful pictures may be made quite successful. Once a negative of a certain aged Baroness was put into his hands with strict orders to make her as youthful as possible. He did, and the lady liked the picture exceedingly. As regards alterations of the features, he said that, compared with the nose, the alteration of the jaw was very easy. He quite agreed that retouching should be limited to the bettering of the negative sent. The negative of a first-class operator having a fully developed image should only require a slight amount of retouching. The retoucher, in fact, should help the operator, and the retouching should be kept subservient to the likeness. He had often been asked to describe his method of working. The only peculiarity of his method, if he had one, was perhaps a certain amount of taste, a small amount of knowledge, and a little common sense mixed up with it. He simply took out defects with whatever stroke was necessary, always keeping the main object of the preservation of the likeness in view. He could not see how cross hatching could be accepted as the ideal of retouching, while S's all over the negative, unless produced with great precision, would not conduce to a good effect. He considered a quarter of an hour a fair time to spend over a cabinet vignette head; but one of the most successful retouchers would spend as much as three hours, which was quite needless. People made a mistake in wishing the retouched negative to look bright; to make it so one had to overwork it. The retoucher should be able to judge of the printing qualities of the negative. If a portion of a negative printed white, why should the retoucher cover it with more work, and so perhaps take away a delicate half-tone? Negatives upon which a great deal of work had been put might look ten times better than those upon which less work had been placed, but the former would come out as shadows in the prints. He advocated the treatment of negatives in a broad and open style. Scraping was simply done by cutting down—he preferred a clean cut on the film, backing it up with transparent paper and "drawing in." In this connexion he mentioned a group in which the Princess of Wales figured, and in which the head of one of the gentlemen rested against Her Royal Highness's bustle. Of course, the Prince of Wales objected to the proof, and a negative was sent to him (Mr. Barrett) to cut out the figure of the gentleman. In such a case he advocated printing one or two copies before getting the background correct; it was wise not to try and get the result at once, as they would be likely to overdo it. One of the best ways to work on the film was when one had done with pencil and colour was to varnish, and then follow up with pencil again. In the cutting of ladies' waists, they should be careful not to disturb the balance of the body. It was a pity, he thought, that operators did not as a rule retouch, it was so easy. An operator should certainly speak to the retoucher on the subject of the negative to be retouched, and thus give him the chance of making alterations which would be beneficial to the picture. For instance, in the matter of altering ladies' waists, this could be helped out by the operator in the positions of the arms. Mr. Barrett concluded by pointing out that the photographer often took credit for what was to the credit of the retoucher.

Mr. J. S. TEAPE asked if Mr. Barrett could say anything of the quality of the medium in relation to the pencil. Many retouchers used H. B.; others four or five H.'s. He supposed a different medium was used in each case?

Mr. BARRETT said he used any pencil with any medium, but he did not believe in hard pencils. Of the soft grades, No. 3 was a good and safe pencil. Hardmuth's ordinary No. 3 would be somewhere about B., and was very soft. The softer the pencil, the greater the deposit. For a four-inch head he would use a very soft pencil. He recommended a light touch and a broad point, objecting to fine points on the grounds that scratching effects resulted. With a soft pencil more continuous effects were obtained.

Mr. TEAPE said that with some of the mediums in the market he found it impossible to produce a delicate touch with H.B., the medium having such a tooth that it would not take a small quantity of lead, but received it in the form of powder, although he only used a small quantity of the medium.

Mr. BARRETT said the medium he used for many years was the Autotype Company's. Rubbing on with the finger was unsafe, as, if there was the least particle of moisture upon it, the negative was likely to be injured. He generally applied the medium with a little cotton wool.

After further discussion,

The CHAIRMAN in moving a vote of thanks to Mr. Barrett, which was carried, said that Mr. Barrett stated that retouching was generally bad. He (the Chairman) quite agreed with that. What was bettering the negative? He thought it was where they made up for faults in the photographic process, and then retouching was strictly legitimate and desirable. The difficulty of rendering the gradations as they should be in the deeper tones made the shadows of flesh too dark, and if they lightened those, and did nothing more than that, and corrected the defects of colour, they were certainly trying to do what photography would do if it was perfect. He thought, on the whole, that retouching had been a great affliction to photography, and that it was the cause of the great depression in photographic portraiture. People had got used to retouching, and that certain amount of prettiness that went with it, and were not satisfied without it. At the same time these portraits did not afford the same satisfaction that portraits did before retouching came in. It was that want of thorough feeling of satisfaction that had made people indifferent. He agreed with Mr. Barrett in denouncing cross hatching, but quite thought he (Mr. Barrett) was mistaken in saying he had no method. There was a great deal in method, and Mr. Barrett doubtless used a great deal of method himself, although he might not recognise it. There was a great deal of method in drawing and cross hatching in ordinary artistic work in black and white, crayon or pencil, or anything of the kind. Mr. Barrett's method would have been of use to the members. He was glad to hear him say that it was not necessary to spend a long time over a negative. A great deal more work was often put on a negative than was necessary, which tended to remove the likeness. They constantly saw photographs with the faces fattened out, which the retoucher said was making the sitters look younger. Was that improving the negative? If the negative were brought back to the proper point, it was an improvement; but going beyond that a mixture of the present face with the face of twenty years before was a great mistake.

AMIDOL AND HYDROQUINONE.

Mr. Archer Clarke showed several negatives, covered more or less with opaque spots, caused by commencing development with amidol, and then, to obtain density, using a hydroquinone developer, the result being, as he described it, an utter failure.

The meeting then terminated.

Holborn Camera Club.—October 14, Mr. A. J. Golding in the chair.—The SECRETARY announced that the annual supper of the Club would take place at Anderton's Hotel on Saturday, December 3, and that the annual exhibition had been fixed to be held in February next year. Mr. A. HORSLEY HINTON read a paper on *Accident and Intention* (see page 679). A discussion followed.

Aldenham Institute Camera Club.—October 11, Mr. W. Vere Mingard in the chair.—The CHAIRMAN called on Mr. H. J. Redfern to give his demonstration on *Enlarging*. Having fully explained the method of focussing, and the uses of vignetting cards, Mr. Redfern exposed two enlargements of a view of the Forth Bridge, which he subsequently developed in the presence of the members, also showing them the various dodges resorted to in development, &c.

Kensington and Bayswater Photographic Society.—October 17, Mr. R. Frogbrook presided.—It was resolved that a lantern should be purchased as soon as the funds should permit. The following donations had already been offered, namely, 1*l.* each from Messrs. Robinson, Hahm, and Brumwell. On ascertaining the total cost of lantern and accessories, Mr. Robinson kindly offered to increase his donation to the amount required, which is 9*l.* 16*s.*, thus making his generous gift amount to 7*l.* 16*s.* A hearty vote of thanks was presented to Mr. Robinson for his great kindness. Mr. G. Bursnell was elected Honorary Lanternist, and Mr. Brumwell Honorary Librarian. Upwards of eighty slides were shown by Mr. G. Bursnell in the lantern lent by Mr. Short. The members who exhibited were Messrs. Bursnell, Davidson, Frogbrook, Hahm, Hannaford, Hodd, Jones, Parratt, Seales, Sutherland, and Brumwell.

It were invidious to select for remark from so numerous a collection. The hand camera furnished the bulk of the pictures, and the snap-shots were as varied as the tones in which they were printed. The Lanternist showed some excellent results on printing-out slides of his own manufacture.

West London Photographic Society.—October 14, Annual General Meeting, the President in the chair.—The report was adopted, and the following officers elected for the ensuing year:—*President:* Mr. J. A. Hodges—*Vice-Presidents:* Messrs. W. A. Brown, C. Bilton, W. L. Colla, and C. Whiting.—*Council:* Messrs. J. J. Adam, J. D. England, R. Horton, G. Lamley, H. Selby, A. W. Scanlan, G. E. Varden, R. W. Watson, J. Wilson, C. Winter; *Hon. Librarian:* J. Wilson.—*Hon. Lanternist:* R. Horton.—*Hon. Auditors:* J. Stein and T. Turner.—*Hon. Treasurer:* W. H. Whitear.—*Hon. Secretary:* L. C. Bennett.—*Assistant Hon. Secretary:* W. S. Rogers. The terms of amalgamation of the Chiswick Camera Club with the West London Society were formally agreed to, and it was felt that the example thus set by the West London and the Chiswick Societies might be followed with advantage in those districts where two or more societies were trying to do the work which might be much better done by one strong central society. The CHAIRMAN stated, owing to new arrangements having been made at the School of Arts, it was found impossible to hold the meetings on Fridays as heretofore, and after some discussion it was arranged that Rule 7 should be altered by inserting the word "Tuesday" in place of "Friday." The change of evening will, however, not come into effect for a few weeks, and members are notified that the next four meetings will be held on the usual Fridays—October 21, Technical Social; October 28, Presidential address and lantern; November 4, Technical Social; and November 11, Mr. E. J. Wall's paper. After that date, however, the alteration will come into effect. Happening at the last moment, when it was totally unexpected, this has necessitated some alterations in the syllabus, and will lead to a slight delay in getting it printed, but every effort will be made to make the delay as short as possible.

Croydon Camera Club.—October 17, Mr. H. Maclean, F.C.S., taking as his text the Pall Mall Exhibition, gave a comprehensive exposition of his views and impressions of the chief works shown. In his introductory remarks he dwelt upon the value of an untrammelled criticism, especially when, being delivered *viva voce* at a Society meeting, any observations which were either unduly favourable or the reverse were subject to revision in the course of the evening discussion. One amongst other results of the discourse was an expression on the part of a large proportion of those present to lose no time in paying the collection a visit. Space does not allow us to give a detailed report of what proved to be an address replete with original matter. Following the above, Mr. A. E. Isaac read a paper on reduction and intensification of negatives, in the course of which he very clearly explained how, in certain cases, the application of an intensifier could be made to reduce contrasts and conversely a reducer made to increase contrast. The advantage of reduction, followed by intensification with suitable negative, was also set forth. In the discussion which followed, the President, and also Mr. Sargeant and Mr. Packham, advocated where an otherwise satisfactory negative required to be altered. As regards to printing qualities that the system of making a positive on glass, and using the modifying frames of varying exposure and development, and then obtaining a fresh negative from the transparency, should be adopted. In the course of the evening, the President presented Mr. E. H. Holland with Woodbury's *Encyclopædia* for the best print taken at a Society excursion. Mr. Packham and Mr. Hirst showed several successful enlargements, and Messrs. Sladden and Brookes a large collection of prints taken during their holidays. It was announced that a special lantern show will be held on Friday, November 4, at the Braithwaite Hall. The lecture will be for the benefit of the Club funds, and tickets may be obtained of members, price 1s. each.

Hackney Photographic Society.—October 11.—Being a Lantern Evening the usual questions were curtailed, and Mr. S. J. BECKETT proceeded to give an account of his three journeys to Norway. About 150 slides were shown, and upon each Mr. Beckett contrived to obtain some merriment. There was, perhaps, a little too much punning, one of which was a little too much for even the sedate Hackney men. "This," he said, "is a gorge outside the hotel, but is nothing to the gorge taking place inside." The lecture, however, was very much appreciated by a crowded audience, after which slides by the following members—Messrs. Carpenter (flower studies), Brown, Hudson, Grant, Dean, and Hankins—were shown.

Leytonstone Camera Club.—October 15, Mr. J. Watson Brown, M.A., in the chair.—Mr. D. G. RIDDICK delivered his lecturette upon *Hand Cameras*. He exhibited and described the "Shuttle," which was admired for its simple changing action; the "Frena," the good points of which are its simple changing action and swing back; Messrs. Watson's "Vanneck," which is fitted with a finder almost as large as the plate, and has many other improvements. He also showed Mr. Roberts' hand camera, which is provided with a swing back, and may be used upon a stand. Mr. Symmons then showed his "Eureka," and the President showed his Roberts' "Magazine" camera. Mr. Cricks, a member of the Club, brought up a new hand camera of his own invention, which met with great approval, and has advantages in respect of changing movement and shutter over any in the market. The lecturer exhibited as well numerous results of his own in this class of work, and some enlargements from hand-camera negatives. In the discussion that followed, the PRESIDENT said he preferred plates to films. He was also in favour of blind shutters. He then pointed out several advantages of a hand camera—its portability, always ready for use, being able to work without getting a crowd round, and not likely to have remarks passed and attract attention; he thought that no photographer's outfit was complete without one. Mr. WATES advocated complete simplicity of action, and was glad to see the introduction of a swing back as in the "Frena" and "Roberts," as he thought that the want of one in some of the hand cameras of the day were their great fault. Mr. T. SYMMONS followed, and considered that for snap-shots and for travelling hand cameras were all that could be desired, and strongly advocated their being as small as possible, consistent with efficiency; he also preferred a fixed focus lens, and pointed out the many advantages, but still thought that, when you once come to time exposures, there was nothing like our old friend on the tripod with which we can take our time with focussing, and have our swing back, side swing, rising front, level, &c.

Birmingham Photographic Society.—October 11, Mr. G. A. Thomason in the chair.—Mr. W. B. OSBORN read a paper on *Forgotten Processes, and Self-Help for Amateurs*. During the course of his paper, he described and illustrated some simple methods of making focussing cloths, various kind of shutters, single and double dark slides, dark-room and travelling lamps, a method of printing stereoscopic pictures, which avoids the necessity of cutting and transposing the prints before mounting, and also many other things of interest to the amateur photographer. A simple carbon printing process, invented about forty years ago by the late Mr. Pouncey, was very fully described. Several prints made by the inventor of the process and by Mr. Osborn were exhibited. A plate-washer by Messrs. Smith, of Leamington, was shown.

Brighton and Sussex Natural History and Philosophical Society (Photographic Section).—The winter session was inaugurated on Friday last, in the Librarian's Room, Royal Pavilion. The CHAIRMAN, Mr. J. P. Slingsby Roberts, delivered his opening address as follows:—"You have done me the honour of placing me in the chair of this section, and I beg to return you my sincere thanks for having elected me in my absence to so honourable and responsible a position. I am privileged to succeed Mr. Caush, who has been deservedly called to a higher sphere, and I can only wish that it were possible for me in any degree to approach him, and to fit myself, as he eminently is fit, to take the lead among you. *My* qualifications for the post of your chair are very small. As a photographer, I am an amateur of amateurs, a learner among learners; but I yield to no one in my love for the art; indeed, I cannot imagine any one who once has taken up a camera feeling anything but an increasing interest in his work. As time goes on, and he gains experience and technical knowledge, so much is opened to his mind, the pleasures of the objects around him become so greatly enhanced, that the man must be dull indeed who is not impressed by what he gains. Whether we look to the scientific or the artistic side of photography, we see its great utility as a means of education, and it truly has been called a handmaid to the sciences and arts. Our old Society has gone. Peace be to its ashes! But we must all admit that in casting in our lot with this Society we have done wisely, if for no other reason than that we are untroubled by financial considerations. The "res angusta domi" haunts us no longer. We are now inaugurating a session in our new home, and it becomes us to think how we can best justify our existence as a section of so old and well-established a Society as that of which we are now members. The Society has kindly met us with readiness, and has altered its rules for the purpose of enabling us to join it, while keeping our separate identity. How can we as photographers contribute to the general objects of the Society and promote its good work? After some thought and a great deal of hesitation I have decided to recommend to the members of this section that it should undertake a photographic survey of the county of Sussex. That certain districts should be allotted to such members as express themselves willing to join in the work, the objects of which would be to illustrate the beauties of the natural and artistic features of the county, and by such records to preserve memorials of those objects upon which time—the consumer of thing—is fast laying his hands on. Similar undertakings have been carried out in other counties by the local photographic societies, and even in Sussex, less rich though it is in beauties, historical and otherwise, the work would commend itself to us; but when we know what she has been in the past, how her history is, from the time of the Conquest, inseparably interwoven with that of the nation at large, and what precious relics illustrating that history are still ours—ours perhaps but for a season, for in these utilitarian days many agencies are at work before which the past, with all its traditions, must give way—when we think what Sussex is now, and realise how priceless to us would have been such a record had our ancestors been able to form it, we surely cannot hesitate to make this our first work, and attempt to do our duty to those who come after us. If this idea is approved and well carried out, I venture to think that the Photographic Section of the Brighton and Sussex Natural History and Philosophical Society will have done something by which it may be remembered. I have reason to believe that the President-elect of the Society will concur in my views as to this, and perhaps some one who agrees with me will move a resolution approving the scheme and referring the matter to the Committee to settle the details. In the meantime I can do no harm in saying that any suggestions from the members of the Society, or of this section, as well as any offer of working help, will be gratefully received. Before I sit down I should like to call your attention to the Prize Fund. This is one which concerns this section alone, and, as we have no funds, we must depend on voluntary subscriptions. It is felt by the Committee that prizes of some sort are necessary to encourage rivalry, and the fund has, as you will see by the lists before you, been started. It is hoped that the requisite amount, which is not large, will be soon got together, and perhaps, through casting their bread upon the waters, will find it again after a short time in the shape of medals or certificates, either of which, I can testify, is worth possessing, not only for the sake of the honour, but as a work of art, they having been beautifully designed by Mr. Hunter Graham, an artist whom we have the good fortune to number among us. Allow me, in conclusion, to thank you again for intrusting me with the duties of this chair—duties which are the more responsible as, by a recent vote of this society, Chairmen of Committees are members of the General Council of the Society." This was followed by a paper, by Mr. E. J. BEDFORD, on *Perspective as Applied to Photography, the Use and Abuse of Wide-angle Lenses*. The lecture was profusely illustrated by carefully prepared diagrams, and handled in a very able and practical manner. A discussion followed. The Committee recommend that a competition for hand-camera work should be instituted, which was carried.

Derby Photographic Society.—October 11.—The first business was the election of officers for 1893, which resulted as follows:—*President:* Captain W. de W. Abney, R.E., F.R.S., &c.—*Vice-President:* Mr. Richard Keene.—*Committee:* Messrs. G. Walker, T. Scotton, C. B. Keene, A. H. Bennett, R. Woods, C. Bourdin.—*Treasurer:* Mr. A. B. Hamilton.—*Hon. Secretary:* Mr. T. A. Scotton, 9, Church-street, Derby. It was decided to hold an

exhibition of members' work in January, 1893, and the medals which will be awarded in the outdoor-meeting competition to be presented on this occasion. An exhibition of lantern slides made by the members was also held, about 120 pictures being passed through the lantern. Votes of thanks to Mr. Keene for presiding, and to Mr. A. Scotton for managing the lantern, were passed, this concluding a very interesting evening.

Minneapolis Camera Club.—This Club was organized last May, and was incorporated June 4 following. A committee was put at work at once, looking up suitable rooms. They succeeded in securing very satisfactory quarters at No. 26, South Sixth-street, between Nicollet and Hennopin-avenues, the two principal streets in the city. The location is a convenient one; one street car line passes the door, and nearly all the others within half a block, and only half a block from the business centre—Nicollet-avenue. The Club was fortunate in finding such a location, and also fortunate in the fact that the rooms were formerly occupied by a professional photographer as a gallery, and are well adapted for the purposes of a Camera Club. The first, as you enter, is the reception-room and library, 12×14 feet in size, and is neatly furnished in antique oak. A large Smyrna rug covers the floor, which adds a bit of comfort to the general homelike air of the room. Over in one corner stands a book-case, well filled with photographic literature. This is one of the instructive as well as ornamental features of the room. A reading table, covered with all the current photographic magazines, stands in the centre of the room. The next room is used as a general work-room, and contains twenty lockers. It is here that the members of the Club keep their apparatus and various other pieces of personal property, and it is here where all work of a "tinkering" nature is done. Passing from the work-room, through double doors, one enters the large and commodious dark room, which is fitted with three sinks and all the usual paraphernalia of a modern developing-room. There is a gas stove for heating water and for platinotype developing. Incandescent electric light is used exclusively in this room, as well as in all the others, for lighting. Orange-coloured paper is used as a medium for obtaining non-actinic light. The lamps are ingenious contrivances, whereby any number of thicknesses of paper or glass may be used and changed at will, or the whole arrangement may be detached instantly, leaving the ordinary white light. There is space left in this room for three more sinks, should it be found necessary to put them in. Going back through the finishing-room, one enters the studio and exhibition-room. It is 15×36 feet in size, making it sufficiently large for all purposes for which it is intended. It can also be used as a hall for public exhibitions, as has already been done, seating 100 persons. In this room is one of the best skylights in the city. The top light is 12×12 feet in size, and is at an angle of about 45°. The side light is 5×12 feet, and reaches within two feet of the floor. It is well provided with shades and curtains, so any desired effect in lighting may be produced. The room is well equipped with backgrounds and accessories, and the Club is now negotiating for the purchase of a portrait camera and lens, which will be added in a short time. One background is 10×10 feet in size, and has a lantern screen on the back, so that by simply turning the frame around, and placing the other backgrounds behind it, and out of the way, the room is ready for a lantern entertainment. The Club is fortunate in having the use of a 200 dollar dissolving stereopticon, the property of the President, which is always available for such entertainments. One more room is an extension of the dark room, and can be reached from the studio or from the finishing-room. It is a convenient place to change plates while using the studio, but it has been reserved for the enlarging apparatus, which will soon be in place. The rooms have all been newly decorated, the floors polished, and the woodwork refinished. The printing-room is on the next floor above, and has a capacity of about fifty frames. It is well provided with sinks and washing tanks. This gives the members all of the advantages of a well-equipped photographic studio, in addition to the many social features of the Club. The regular meetings of the Club are held on the second Wednesday of each month, and arrangements have been made for a series of lectures on various subjects of interest to photographers, which will extend nearly through the winter. There will also be a series of special meetings on the fourth Wednesday of each month, when some member will be selected to provide such entertainment as he is fitted for. The membership of the Club is divided into three classes—active, associate, and honorary. It is necessary that active members should be residents of Minneapolis, and over eighteen years of age. Associate members include ladies, non-residents, and stock dealers. The active membership is limited to fifty, the associate to twenty-five, and the honorary to ten. The initiation fee for active members is ten dollars, and the annual dues are also ten dollars. The associate members are required to pay one-half the above amounts. The Club extends to the members of other photographic clubs throughout the country invitation to make use of the rooms and all their privileges while in the city. A reception was tendered by the Club, Wednesday evening, September 14, to its many friends, in honour of the opening of the new rooms. The invitations were generously responded to, and a large number were present, when Ralph D. Cleveland gave an informal talk on *Pictorial Effect in Photography*, illustrated by about one hundred lantern slides. An admirable feature of the entertainment was the work of the members exhibited about the rooms. The walls of the rooms are hung with framed pictures taken by the members, all of which adds to the artistic effect. The membership is at present twenty-four active, and two associate, with an average of two new applicants each week. If the increase continues at this rate, it will not be long ere the limit to membership is reached. The officers are:—*President:* Mr. William M. Tenney.—*Vice-President:* Mr. William Channing Whitney.—*Treasurer:* Mr. W. C. Porter.—*Secretary:* Mr. A. L. Eidemiller. All the business of the Club is transacted by a board of ten directors, which include the above officers, and the following members:—Messrs. William T. Rolph, J. M. Greaves, E. H. Houlton, F. E. Haynes, Russell M. Bennett, Wayland B. Augir.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—October 27, Members' Open Night. November 3, *Rapidities of Various Printing Processes* (continuation), Mr. B. Foulkes-Winks.

Correspondence.

GELATINE PAPERS.

To the EDITOR.

SIR,—May we point out one or two errors into which "Cosmos" has fallen in your issue of yesterday?

First, we would say, that the "blue nuance" is not inherent to gelatine papers, but is due, in all cases, to the method of toning employed.

With the Ilford formula for P.O.P. this *nuance* is absolutely wanting, and evenness of tone is quite as readily obtainable as with albumenised paper, without any previous experience.

In proof of this we forward you a batch of fifty prints received this morning from a professional photographer; these are not picked prints, but the result of every-day printing-room work, such as we could obtain from fifty or a hundred professional studios to-day. We challenge the most experienced professional printer on albumen to equal these prints under similar conditions.

We would also point out that "Cosmos" is wrong in saying that all the paper which is used for coating comes from one source. We know at least five firms who supply such raw material, and have tried all their productions.

Possibly a little more experience of his subject will show "Cosmos" how much he is in error.—I am, yours, &c.,

For the Britannia Works Company, Limited,
JOHN HOWSON.

Ilford, October 15, 1892.

[The large collection of prints submitted entirely bear out Mr. Howson's statement relative to their absolute uniformity of tone.—ED.]

ENLARGING SMALL PICTURES FOR STEREOSCOPIC EFFECT.

To the EDITOR.

SIR,—An idea has occurred to me of having a quarter or 5×4 camera fitted, preferably with a roll holder and a blind shutter working close to the film, for use for single or stereoscopic pictures. The stereoscopic pictures would, I presume, be too small for viewing through the stereoscope; but could I not enlarge them either on paper or transparency plate, and by so doing transpose them at one operation to the proper position for the stereoscope without any intermediate copying?

I should use the camera for both hand and stand exposures, and by working with lenses at *f*-4, be able, I apprehend, to take snap shots in bright weather, without the brilliant glaring sunlight so necessary for most hand cameras. A horizontal level would be used for stereo snapshots.

Would you be so kind as to say whether in the above idea there is anything optically, or mechanically wrong or impossible, and if not, could you suggest any improvement for the purpose I have in view, bearing in mind that I expressly wish for a small camera. At the same time, kindly say if you consider there is really any ground for the statement frequently made, that enlargements from transparent films are coarse and grainy compared with those from glass negatives. With thanks in anticipation, I am, yours &c.,

INTENSITY.

October 15, 1892.

[No amount of subsequent enlargement of the small pictures would give the necessary stereoscopic effect. A stereoscopic angle, the base of which is less than the distance of the eyes apart, is unsatisfactory. Enlargements made from transparent films are not necessarily coarser than those made from glass negatives.—ED.]

AN AMALGAMATION OF SOCIETIES.

To the EDITOR.

SIR,—Will you kindly note that the amalgamation of the Chiswick Camera Club with the West London Photographic Society, has been accomplished, and that the official title of the Society, for the space of one year from the present time, will be "The West London Photographic Society, with which is amalgamated the Chiswick Camera Club."—We are, yours, &c.,

LIONEL CHARLES BENNETT,
Hon. Sec. West London Photographic Society.
H. HARDING MILLER,
Hon. Sec. Chiswick Camera Club.

October 15, 1892.

"COOL WATERS."

To the EDITOR.

SIR,—Messrs. Morgan & Co. may dismiss their anxiety; I do not want their money. I have attained my object, which was to make it known that they had no right whatever to be described as producers of the photograph from which the reproduction in the *Illustrated News* was taken, to which reproduction their name was appended.—I am, yours, &c.,

HENRY WHITFIELD,

October 17, 1892.

To the EDITOR.

SIR,—I have long since ceased to take any active interest in photography, and it was only by what I may term a most extraordinary incident that my attention was drawn to the correspondence respecting the picture *Cool Waters*, and, as my name has been used in connexion with the said picture, perhaps you will kindly allow me a hearing in the matter, *i.e.*, if you and your readers are not already tired of the subject.

Memory is proverbially treacherous, but I think I can safely say that the ticket in question does *not* bear the description which Messrs. Morgan say it does. What it does say, and what it was carefully and deliberately meant to say, was: *Cool Waters.* Photographed from Nature. Enlarged by J. Vaughan. The omission of the conjunction "and" makes all the difference in the meaning intended to be conveyed, so that Mr. Whitfield's contention that the ticket only "told half the truth" at once falls to the ground.

But, further, Mr. Whitfield says that "the enlargement merely was Mr. Vaughan's part." The *real* history of the picture in question is as follows:—Mr. Whitfield was fortunate enough to secure a negative of the cattle in the water; a print or two was struck off from it, and the negative stored away. One day, in looking through the negatives, I came upon this one, and I thought it would make a good picture if enlarged. I therefore took it in hand, *selected a suitable* cloud negative to go with it, and then made a combination carbon transparency. Only those who have had to make such combined transparencies can realise the care and difficulties involved; at least a dozen were made before one at all satisfactory was secured. It was then put in the enlarging camera and enlarged *so as to leave out one of the animals*, which, being somewhat separated from the rest, spoilt the balance of the composition. My partner, Mr. Whitfield, was then consulted, and he approved, the enlarged negative was then made, and copies printed, and *I* afterwards dubbed the picture *Cool Waters.*

By this you will see that not only was the enlargement my work, but also the combination transparency from which it was made, and also the title was my selection. I therefore leave it with you and your readers to judge who was most responsible for any merit the picture may have; but does not this reduce the previous correspondence to the *reductio ad absurdum?*

Apologising for troubling you with so long a letter on such a personal subject.—I am, yours, &c., JOHN VAUGHAN.

Edinburgh, October 15, 1892.

[This correspondence here terminates.—ED.]

THE LEYTONSTONE EXHIBITION.

To the EDITOR.

SIR,—Will you please give notice to remind your readers that October 25 is the last day for receiving entry forms in our forthcoming Exhibition.—I am, yours, &c., A. E. BAILEY.

Rose Bank, South-west-road, Leytonstone, October 17, 1892.

THE SOLUBILITY OF SULPHATE OF SODA.

To the EDITOR.

SIR,—My attention has been called to a paragraph in last week's BRITISH JOURNAL OF PHOTOGRAPHY, in which "Cosmos" criticises a statement which I made *re* oxidised sulphite of soda, at a meeting of the Hackney Photographic Society, held September 6, and states that sodium sulphate is about twice as soluble as the sulphite.

He is correct if he refers to the solubility of ordinary crystallised sodium sulphate in cold or warm water, but four forms are known—(1) anhydrous; (2) with 1 molecule of water of crystallisation; (3) with seven molecules of water; (4) with 10 molecules; the last is the ordinary commercial form, but I referred to the first (anhydrous) form, and its resistance to the action of hot water. According to Foureroy, sodium sulphite dissolves readily in an equal weight of water at the boiling temperature, whereas anhydrous sodium sulphate requires about two and a half times its weight of water at the same temperature (Gay Lussac), and then dissolves very slowly.

Sodium sulphate is more soluble in water at 33° C. than at any other temperature. When a solution, saturated at this temperature, is cooled, it deposits ordinary crystallised sodium sulphate (providing a nucleus is present); but when the temperature is raised, it deposits the monhydrated sulphate $Na_2SO_4H_2O$. If ordinary crystallised sodium sulphate be boiled with water, a portion of it soon becomes converted into white opaque masses, which are very difficult to dissolve. The member had used hot water (boiling, if I remember rightly); from his remarks, I concluded that the substance consisted chiefly of the sulphate, and, as sodium sulphate is completely efflorescent, there was probably a considerable quantity of the less hydrated forms; I therefore thought that the residue, as well as the failure to prevent stain, would probably be "due to its having been oxidised to sulphate."

Reports of meetings of societies are (generally) necessarily brief, and full explanations cannot well be given. "Cosmos" would do well to remember that many substances exist in more than one form, and that different forms often have different properties, also that the temperature often influences the result.—I am, yours, &c., W. H. SODEAU.

October 18, 1892.

FREE LANTERN ENTERTAINMENTS.

To the EDITOR.

SIR,—A society is being formed for the purpose of giving free lantern entertainments at the various London hospitals and charities. The first meeting is fixed for Thursday next, the 27th inst., at the above address, in room XL, for 8 p.m. sharp, when all gentlemen wishing to help in this effort to brighten the lives of our less fortunate fellow-creatures are asked to attend the meeting.

All who wish to join this society and cannot attend are desired to communicate with the undersigned.—We are, yours, &c.,

Y. M. C. A., 182, *Aldersgate-street, E.C.* B. FOULKES WINKS, F. SIMMONS, } *Secretaries.*

"NEGATIVES FROM NEGATIVES."

To the EDITOR.

SIR,—My attention has been directed to a communication on the subject of reversal, or "Negatives from Negatives," by E. Frewing, in last week's issue.

The following statement is the part which most interests me. He says: "If you begin with a short exposure, you obtain a transparency; continue the exposure, you get a negative; further expose, and you again find you have a positive; and these changes undoubtedly occur many times over." This statement does not in the least agree with the result of my experiments in the subject. I have not been able to obtain a positive after the first reversal. My experiments were carried out in the following way:—An opaque material was used to cover half-plate; ten diamond-shaped openings of half-inch side were cut in this screen, and put in front of an Ilford ordinary. The exposures were 1, 2, 4, 8, and 16 seconds to clear sky, and so on until 8 hours 59 minutes and four seconds were reached. They were developed with hydroquinone. I may just say that at the end of each exposure a piece of opaque material was gummed over the opening.

Now, all these diamond shapes are clear, the first one not quite so clear as the rest; but even this is as clear as the majority of negatives. Not being satisfied with this, I went further. With a plate behind opaque screen, I exposed openings from one hour to eight hours to the strongest sunlight in August, developed with hydroquinone, and still there is no change in the exposed openings. But, judging from the halos which appear round some of the openings, I think it is plain that even the protected part of the plate is becoming reversed by the spreading or scattering of the light. It is this scattered light which forms the image in obtaining a negative from a negative. To guard against any mistake, I have made the experiment described by Mr. E. Frewing, with result as I expected—no positive after the first reversal.—I am, yours, &c., J. S. TEAPE.

54, *Pearson-street, Kingsland-road, October* 18, 1892.

LANTERN POLARISCOPE AND ELECTRIC LIGHT.

To the EDITOR.

SIR,—In reply to Sir David Salomon's letter in last week's JOURNAL, I am very glad to learn such satisfactory results can be obtained with the polarising apparatus having small prisms, and that lecturers who have access to electric-arc lanterns will be able to avail themselves of moderate-priced polariscopes for projection work.

This subject is of so much interest that I propose later to refer to it in a separate article, also to the use of the incandescent electric light in ordinary optical lanterns. My own experience at first was, like Sir David's, somewhat adverse to the "focus" lamp; but, with modified apparatus, it answers capitally, and performs useful work in the drawing-room for projecting photographs, &c., and for lectures to small classes, without injuring the slides.—I am, yours, &c., G. R. BAKER.

London, October 18, 1892.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Technical Meeting, October 25 Subject: *Architectural Photography.* This meeting will be held at the Society's rooms, 50, Great Russell-street, *and not at the Gallery*, as previously announced.

AT the sixteenth annual Stanley Show of bicycles, tricycles, their accessories, cycle-making machinery and tools, and photographic apparatus by the leading houses in the trade, to be held at the Royal Agricultural Hall, Islington, N., from November 18th to 26 inclusive, there will be a photographic section. Fifteen medals (five gold) are offered for competition. The Judges are:—Mr. J. Traill Taylor, Mr. H. Sturmey, Mr. Andrew Pringle; and the Hon. Secretary is Mr. Herbert Smith, 29, Finsbury-pavement, E.C., of whom entry forms and all further particulars may be obtained. The following are the classes:—A. Instantaneous Cycling Subjects, sets of four. B. Instantaneous General, sets of four. C. Landscape or Seascape, with or without figures. D. Lantern Slides, sets of six. E. Pictures by Platinotype Process, any subject. Of these classes A and E are open; while B, C, and D, are open to amateurs only. In C and E, the medals being for single pictures, they should, if possible, be framed separately.

Answers to Correspondents.

PHOTOGRAPH REGISTERED:
John Anderson, Dalry, Ayrshire.—*Photograph of the Rev. J. L. Fyfe.*

W. H. FRYER.—No work is published on the subject.

R. N.—Employ thick starch paste. There is nothing better.

C. G. B.—The cause of the spots on the prints is being investigated.

F. BROMHEAD requires the address of Messrs. Mason & Payne, the makers of the Crystal Palace lantern screen.

W. W. N.—Supposing the wide angle and the rapid doublet be worked with the same ratio of aperture to their focal length, there will be no difference in their rapidity.

A. B. inquires: "Will some one kindly instruct me in the best way of enamelling photographs with collodion? I have tried squeegeeing them on glass, but find it is not a permanent enamel. Is the spotting done before or after enamelling?"

J. D. TRINGROE (Whittlesea).—By copying and selling the pictures you render yourself liable to prosecution. We gave you this answer on September 23. Why do you not read your JOURNAL? We do not undertake to answer letters through the post.

R. WADE.—A suitable gas engine for generating electric light for studio work would be a six or eight-horse power "Otto." It would be more economical to obtain the current from some local installation if possible. Surely the electric light is in your town.

A. WALTERS asks if there is any way by which sensitised paper that has become discoloured by keeping can be utilised?—The only way we are aware of is to add it to the residues, and thus obtain the silver from it. There is no way of using it for printing.

WILTSHIRE.—If the engraving is copyright, and there is very little question in the matter, it will be illegal to copy any particular figure in it for any purpose whatever. It matters not that the artist and engraver both reside abroad if the copyright is registered here.

INQUIRER (Liverpool).—The only suggestion we can make is to advertise for employment. You might also apply to the Photographers' Benevolent Association. The Secretary might have a vacancy on the register. Unfortunately, there are a large number of assistants out of employment just now.

A. W. J.—There will be no difficulty in enlarging on bromide paper from quarter-plates in a lantern with a four-wick lamp. Enlargements are made in this way by many amateurs during the winter evenings. One or two trials on small pieces of paper will give an idea of the exposure required. Experience in this direction is quickly ganied.

E. H. D.—It is impossible to say the cost of sensitising a quire of paper without knowing the amount of chloride with which it is salted, and the time it is floated on the silver bath. The only way by which the cost can be arrived at with accuracy is to prepare a bath of a given strength, sensitise a quire of paper upon it, then assay what bath is left, and see how much silver has been consumed.

QUIZ says: "How do you think, with regard to photographs taken while you wait, the ordinary dry plate would do developed up thin, and after washing immersed in a solution of chloride of mercury, which brings it up very near the glass positive in resemblance. As to its permanency I cannot speak?"—The idea might answer if the picture were backed up with a black substance; such an image would be permanent enough as things go.

S. W. says: "While intensifying a negative with mercury and ammonia I have unfortunately, through careless washing, stained it badly. If my memory serves me right, there was a bath of some kind mentioned in one of the ALMANACS for removing such stains, but I have looked through eight of the ALMANACS without coming across it. Can you help me?"—Probably by converting the image into pure silver chloride and dissolving off in hypo the stain will vanish. You will then need to reintensify the image.

PUZZLED writes: "Enclosed you will find a photograph, which you will notice has a yellow cast in one corner; it will spread all over the print in time. It has been finished about six months. I have been puzzled a great deal lately with my prints turning out like this. Of course, only some of a batch turn out like this. I would be glad of your advice as to the cause."—The yellowness complained of arises from the print being imperfectly fixed—time in the bath too short, bath too weak, or prints allowed to stick together while in the solution.

S. WILKINS says he has been making experiments in carbon printing by the single transfer method, and, intending to try the double, obtained some flexible support for the purpose. Being told to treat that like the single transfer paper, he finds, upon putting it in the cold water, that the surface behaves just as if it were greasy. He asks if this is as it should be?—Yes, the prepared surface has been treated with wax to prevent permanent adhesion of the picture. As our correspondent appears to require a little elementary instruction, we advise him to obtain a cheap work on the subject.

BHOOLIGHAN says: "I should esteem it a favour if you would state, in the 'Answers to Correspondents' column of THE BRITISH JOURNAL OF PHOTOGRAPHY, whether silver prints toned but very slightly (just enough to make them of a red brown tint) are likely to fade or otherwise deteriorate more quickly than if the toning process is carried farther towards the purple stage. I like the red brown colour best, but have doubts about the permanence of such prints which I should like resolved one way or the other."—Theoretically, the more the image is composed of gold the more permanent it should prove.

THE LANTERN SOCIETY.—Next Meeting, October 24. A new form of lantern in aluminium shown and worked.

PHOTOGRAPHIC CLUB.—October 26, Smoking Concert. November 2, Annual General Meeting (members only).

HACKNEY PHOTOGRAPHIC SOCIETY.—The last day for receiving entries for the Competition will be the 29th of the present month. Forms, &c., will be sent on application to W. Fenton Jones, Hon. Secretary. Among the apparatus section will be the following:—Marion's, Paget, Park, Platinotype, Wray, Photography, Platt, Wormald, Watson, Doublet, Grant & Cocks (electric lighting for dark rooms). Messrs. Elliott & Son will show their big 7×5 feet picture.

THE Tunbridge Wells Amateur Photographic Association holds its sixth annual Exhibition at the Great Hall, Tunbridge Wells, on Wednesday, Thursday, and Friday, November 23, 24, and 25, 1892. The following are the classes, for members only:—1. Architecture, exterior or interior. 2. Interiors, other than architectural. 3. Landscape and Seascape. 4. Genre. 5. Lantern Slides, best series of six, any subject. 6. Transparencies and Stereoscopic. 7. Scientific, or any subject not included in the above. 8. Four prints from negatives taken with a hand camera. 9. Four Lantern Slides. The following are open to members of any photographic society in Kent and Sussex, best set of four prints:—10. Figure Studies. 11. Landscape, Seascape and Architecture. And the open classes are:—12. Landscape or Seascape, amateurs. 13. Genre, amateurs. 14. Lantern Slides, best series of six, amateurs. 15. Architecture, exterior or interior, amateurs. 16. Landscape or Seascape, professional. 17. Genre, professional. 18. Lantern Slides, best series of six, professional. 19. Portraits, professional. 20. Enlargements. One silver medal will be given for the best exhibit of apparatus. A fee of 10s. 6d. will be charged for a space of twenty square feet. There will be lantern, musical, and other entertainments each evening. Further particulars may be obtained of Mr. Joseph Chamberlain, Hon. Secretary, 14, Calverley Park-gardens, Tunbridge Wells.

LANTERN PLATE VARIATIONS.—We have not for some time seen a small collection of lantern transparencies of more educational value than some shown us by Messrs. Mawson & Swan, Soho-square. They exhibit very plainly the difference of result obtained by slight modifications of the developer. The plates were all taken from the same packet of the "Mawson Lantern Plate," and were printed in the camera, being reduced from a 12×10 negative of Melrose Abbey. They each received an exposure of three seconds. The one which was immediately seen to be the finest of all was developed by hydroquinone, two grains, and potassium bromide two grains. This slide is as near perfection as one can hope to attain. The next best was developed by amidol and bromide, of each two grains. This scarcely equalled the former as regards tone, but still is of a quality that will satisfy the fastidious. In the next, the amount of bromide was reduced to one grain, which produces a sky slightly obscured. The obscuration of the lights is further increased when two grains of potassium ferro cyanide took the place of the bromide, the amount of amidol remaining the same. This veiling is still more pronounced when the amidol was used without either bromide or ferrocyanide. The conclusion we deduce is, that equal parts of hydroquinone and bromide, or amidol and bromide, give, at any rate, with the plates mentioned, singularly fine results, although the blacks obtained with the former of these are rather more delicate and warm.

FORTHCOMING EXHIBITIONS.

November 10–12..... *Leytonstone Camera Club. Hon. Secretary, A. E. Bailey, South West-road, Leytonstone.
" 15–17..... *Hackney Photographic Society. Hon. Secretary, W. Fenton Jones, 12, King Edward-road, Hackney.
" 17–19..... Brixton and Clapham Camera Club. Hon. Secretary, F. W. Levett, 74, Geneva-road, Brixton, S.W.
North Middlesex Photographic Society.
" 18–26..... *Stanley Show (Photographic Section). Hon. Secretary, Herbert Smith, 29, Finsbury-pavement.
" 23–25..... *Tunbridge Wells Amateur Photographic Association. Hon. Secretary, Joseph Chamberlain, 14, Calverly Park-gardens, Tunbridge Wells.
" 24–26..... *Exeter Amateur Photographic Society. Hon. Secretary, J. Sparshatt, Fairfield House, Alphington-road, Exeter.
*South London Photographic Society. Hon. Secretary, C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.

* Signifies that there are open classes.

THE ALMANAC.—NOTICE.

Intending contributors to THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC *for* 1893 *would favour us by taking notice that their articles should reach us not later than Monday, October* 31.

The publishers desire us to inform advertisers that it has been found necessary to fix Tuesday, October 25, *as the last day for receiving advertisements.*

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1695. Vol. XXXIX.—OCTOBER 28, 1892.

IMPROVING THE TONE OF BROMIDE PRINTS.

At the close of a recent leading article on the subject of *The Restoration of Faded Albumen Prints* we mentioned the treatment therein described as a possible means of remedying defects in the colour of developed gelatine prints. Since those lines were written an unusually favourable opportunity has presented itself of putting the process to a practical test in that direction.

In turning over a number of old prints we came across a parcel of pictures printed upon gelatino-bromide paper some four years ago, and representing the results of some experiments in obtaining "sepia" tones. So far as we can recollect without reference to an old note-book, the prints after development were treated with mercury or chloride of copper, and the bleached image then darkened by means of various agents, but so far as we remember sodium sulphite was the salt that produced the best results, and was that, in all probability, used in the case of all the prints found. The bleaching agents may have been varied; indeed, from the difference in their behaviour at the present time, it seems pretty clear that such actually was the case.

Whatever may have been the quality of the tones obtained at the time, either from change or from more recent improvements in methods, they did not now strike us as being anything to boast of, and some of them were stained and spotted as if from contact with moisture, though we know that to have been impossible. At any rate they seemed to offer a good chance of putting to the test the restoration method we recently published for albumen prints. The only doubt that presented itself was whether, after having been once submitted to the bleaching process by means of such substances as mercuric or cupric chloride, they would still be amenable to the newer treatment.

One of the worst prints of the batch was therefore selected for preliminary experiment, and was divided into several pieces for separate treatment. These were all bleached in the same solution of bichromate (as formulated in the article referred to), and after careful washing redeveloped with different solutions. The results varied slightly according to the developer used, but in every case the image obtained was of a most satisfactory character and an immeasurable improvement upon the original. Further, not only was that the case, but the irregular markings which had developed themselves since the former treatment entirely disappeared under the process of renovation, and so completely that it was impossible to detect the slightest trace of them after the prints had been dried.

The preliminary trial proving so satisfactory, the remainder of the pictures were bleached in the same manner, and, after washing, redeveloped with a solution containing half a grain of amidol and five grains of sodium sulphite in each ounce. The majority of them turned out perfectly satisfactory prints of the favourite cool grey tone, the exceptions—having evidently undergone different treatment previously—acquiring an increased density that rendered them too heavy in the shadows, though the general tone was a rich neutral black.

This experiment is interesting as showing that the previous treatment of the prints does not unfit them for restoration by the process we have described; and it is quite possible that by varying the redevelopment the darker prints might have been made to render a better result.

Another experiment shows the elasticity of the process. A developed gelatino-bromide print—the portrait of Princess May, published in our Almanac of 1889—was selected for treatment, the desire being to convert it to a *warm* tone. The result was attained, a light brown image being the result; but, as this proved to be eminently unsuited to such a delicate print, the treatment was repeated with the final result that the print is indistinguishable from others that have not been touched.

MYSTERIOUS MARKINGS ON NEGATIVES.

Since the publication of our article last week, and *apropos* Mr. Bennett's communication on another page, we have had brought before us a number of cases of markings that may well be classed under that heading; some of them remain mysterious still, while in others the enigma has been solved. Let us narrate the former instance first, and leave the solution to such of our readers as are able to accomplish it. A worker, whose ability, carefulness of manipulation, and experience none would be inclined to doubt, had in use a large batch of plates (half-plate size) which were admirable in every respect save for the appearance of a certain class of mark, which marred the appearance, and occasionally destroyed the value of sundry negatives. These markings took the appearance of arcs of a circle cut by the edge of the plate, and were almost transparent. It seemed fairly certain that they were drying marks in the manufacture of the plate, for they appeared nearly always on the narrow side of the plate, whichever might be the direction the finished negatives were racked for drying. Further, in some instances, plates of the same batch were noted, where two were evidently cut from one larger piece, and on them the markings were continuous when the two plates were placed together, as they were when in one piece before being cut into two. At least, three or four out of every dozen exhibited these marks, and ultimately a complaint was made to the manufacturer. At his request a dozen plates were initialled by the photographer, sent on to the maker, and by the latter exposed and developed. Result—not

a mark! a mere faint trace in one plate! Not satisfied, the photographer exposed a second dozen himself, and initialled and despatched them as the first. The result was identical—no stain or mark, or, if any, the faintest trace! The mystery to be solved is, "What variations in the modes of development could have resulted in these drying marks being developed up by one person and not by another?" The only feasible suggestion so far received is, that sulphite was used in one but not in the other case, and that its presence interfered with the penetration of the solutions, and so permitted irregular conditions of the film to more readily influence the development. We must confess, knowing as we do the *bona fides* and the skill of the photographer who had this experience, that we are quite at a loss to understand why the markings should appear under his hands and not under those of the manufacturer.

The next case is rather singular, and as it only last week met with an explanation, we at once put our readers *en rapport* with all the circumstances, as the experience is one that might happen in any studio and fail to meet with an explanation, and again a plate-maker be unjustly blamed.

In this instance it was a professional photographer, who uses a large number of plates, who underwent the annoying troubles we will narrate. He had been working with one make of plate for nearly two years without any fault to find, until, upon the receipt of a new batch, he found a great number of the plates were almost useless through the presence of a number of small semi-transparent spots, mostly uniform in size, though some few were larger and others smaller than this average size. He is not given to complaining of his plates when anything goes wrong, as, he tells us, a long experience has taught him that it is not often that the plate-maker is at fault, though he may appear to be. However, the defect continuing, he sent the plates back, and received in exchange a fresh batch. The first few plates seeming all right, he at once proceeded to work in the usual manner. It must here be noted that these spots were too small to be visible in the dim light of the dark room, and could only be discerned after fixing the negative. His alarm may be imagined when, out of a large batch of negatives, a considerable proportion were defective again, just as those first described. In sending an exchange batch, the maker had sent word he did not see much the matter with the plates, and, knowing his trustworthiness, our informant investigated the matter still further. He discovered on one plate a few minute brown translucent particles, which, at first glance, suggested the splashing of some chemical or varnish. This he was certain could not have occurred. A rigid scrutiny caused a suspicion to arise that these specks consisted of something of the nature of asphalt. Here was the solution of the mystery. The development of this gentleman's plates was performed in wood dishes lined with black japanned *papier mâché*, which had been in use about two years. A close examination revealed the fact that on two of these dishes the japan had apparently blistered off, and in exceedingly small blisters, which, each time they were subjected to slight friction, sometimes even the pouring on and off of water, broke away in small, almost invisible, fragments. During development, although the film was always brushed with a camel's-hair brush at the commencement of the operation, these particles attached themselves to the film and partially arrested the action of the solution around them.

This is one of the strangest tricks of development ever brought under our notice. It will be observed that the sinning particles were not visible before development, they were washed away before fixing, and nothing but chance led to their being discovered at all.

If a moral were to be drawn from this account, it would be that plate-users should be more careful than ever before complaining to the manufacturer of any defect in the plates the latter has supplied.

THE COMPARATIVE HARDENING EFFECTS OF COMMON AND CHROME ALUM.

A CORRESPONDENT, writing with reference to our leading article of August 5 last, on "Clearing Solutions," asks us to give him a rough idea of the strength of chrome solution that will harden gelatine films as much as a five per cent. solution of potash alum. The question is not an easy one to answer in a definite manner, since it would involve a careful examination of the precise effect produced by the respective salts under similar as well as under varying conditions, though, for all practical purposes, we may be able to give such information as may be useful to others as well as our correspondent.

We may premise, however, that our reason for recommending chrome alum in preference to ordinary or potash alum in the clearing solution for negatives or prints was that it seems to offer less chance of setting up injurious reactions that may lead on the one hand to immediate staining, or, on the other, to ultimate fading or destruction of the image. We have frequently directed attention in these pages to the decomposition that occurs when solutions of potash alum and sodium hyposulphite are mixed together, and have pointed out the danger that may arise from applying an alum solution—with or without the addition of acid—to a film containing unremoved hypo. But in addition to this, the presence of small traces of ammonia, or of alkaline carbonates, left in the film by imperfect washing after development, will suffice to cause a precipitate which is afterwards very difficult to remove from the gelatine.

Chrome alum, despite its name, contains no alumina, and is therefore free from these dangers, and though, under some conditions, its solution may be made to throw down a precipitate of insoluble chromium compounds, these conditions are not likely to arise in actual practice, and this, in conjunction with the fact that a weaker solution is equally effective, renders it, in our opinion, a more desirable agent than potash alum for most purposes where the latter is employed.

So far as the two salts have hitherto been used in connexion with gelatine for photographic purposes, chrome alum has been usually employed as an addition to solutions of that substance when a hardening action was necessary, while ordinary alum has generally been used as an application to films already formed, whether on paper or glass, to effect the same purpose. Thus chrome alum is added to gelatine emulsion to confer toughness on the resulting films, and prevent their softening during development, and it is also employed in the manufacture of the "single-transfer" paper used in carbon printing, and for a variety of similar purposes where an insoluble film of gelatine is required. Potash alum finds employment, on the other hand, for hardening and rendering insoluble Woodburytype and similar prints, as well as the different varieties of gelatino-bromide and chloride films of more recent introduction. This difference in their uses is justified in what we have already said, by the fact that common alum is more liable to produce insoluble compounds with gelatine than the chromium salt.

And now, with regard to their relative solubility. That of potash alum, as given in our list of solubilities in the ALMANAC, is, perhaps, rather below the mark. One part of alum is there stated to be soluble in 10·5 parts of *cold* water, which is a somewhat indefinite term; as a matter of fact, that is the degree of solubility at 50° Fahr., whereas a temperature of ten or twelve degrees higher is usually that accepted as the "ordinary" temperature in chemical matters. At 60° Fahr. it is soluble in, as nearly as possible, eight parts by weight of water, or one hundred parts of water will take up twelve and a half parts of potash alum; while soda and ammonia alums, which are occasionally met with in commerce, are much more soluble, especially the former. A saturated solution of potash alum, then, at the ordinary laboratory temperature, will contain about sixty grains to the ounce, though in the majority of photographic dark rooms the contents of a saturated solution will seldom be more than fifty grains to the ounce, and at the present season, in all probability, very much less. We have often spoken of the uncertainty that may arise from the employment of "saturated" solutions, and this is only one more instance of the unwisdom of the practice.

Chrome alum, which does not figure in our list of solubilities, requires a little over seven times its weight of water at ordinary temperatures to effect its solution, and for all practical purposes may be said to be of the same solubility as potash alum. But it differs from the latter in being far less variable in its strength with the temperature. A hot concentrated solution on cooling shows very little tendency to deposit any crystals, and a considerable time may elapse before any such are thrown down, while a solution saturated at sixty degrees would probably remain unchanged if the temperature were reduced nearly to freezing point; so that it becomes very necessary to consider the question of temperature in making any comparisons between the action of the two salts in saturated solution.

This, however, is scarcely necessary; for, though we have never made any attempt to gauge their relative strengths with any accuracy, we believe we may say with perfect safety that the chromium salt is very much the more powerful of the two. The ordinary alum clearing solution, as given in the text-books, consists of a saturated solution of the salt with an addition of either hydrochloric or citric acid; but, if a saturated solution of chrome alum were employed, the action would be so powerful that the gelatine film would be rendered almost, if not quite, impervious to any subsequent treatment that might be necessary. In other words, it would be rendered so hard and so completely waterproof that any fixing or intensifying solution afterwards applied would be unable to penetrate it. Such was our experience some years back when experimenting with concentrated solutions of chrome alum, besides which mechanical difficulties are introduced in employing this salt in too strong solution.

Roughly speaking we should say chrome alum is at least five or six times more powerful in its hardening action when applied in solution to a gelatine film than ordinary alum, and that a one per cent. solution will satisfy all the ordinary requirements for either plates or paper. When used in conjunction with an acid or an acid salt, as in the clearing solution mentioned in our article of August 5, its action may be to some extent modified, and it may possibly be desirable to slightly increase the quantity, the actual proportion of the constituents of that solution as we use it, being:—

Chrome alum	2 to 4 drachms.
Metabisulphite of potash	2 ounces.
Water	20 ounces.

the quantity of the first named being increased according to the hardening effect required or the "softness" of the film in use.

If the metabisulphite be not at hand, four ounces of sulphite of soda may be substituted for it, and sufficient hydrochloric or citric acid added from time to time to make the solution smell distinctly of sulphurous acid.

Tennyson's Portraits.—There was but one Tennyson; but, to judge from the portraits of him that have appeared in the various illustrated periodicals, he must have had many faces, so wonderfully unlike one another are some of the pictures. This, we suppose, will ever be the case while draughtsmen and hand engravers have to be relied upon. Unfortunately, "process blocks" in half-tone at present do not fulfil the conditions necessary for rapid machine printing.

Disused Methods.—Forgotten processes formed the subject of a paper at the last meeting of the Birmingham Photographic Society, and an interesting one it is. The officers of most societies find a difficulty in providing subjects for their meetings. Now there are many processes in connexion with photography that have become obsolete and forgotten, though they possess real merit. Papers or discussions upon many of them would prove exceedingly interesting, and often useful—useful if only in saving the time of some enthusiasts in reinventing them, as is frequently being done nowadays. There is little doubt that several processes become obsolete simply because they were introduced at the wrong time. Some of the photo-mechanical processes might be quoted as an example, also Aristotype paper.

Transformation of Gallic Acid into Pyrogallol, Melting Point of Pyrogallol.—M. P. Cazeneuve says that, if we add to gallic acid double its weight of aniline, the mixture, which is at first liquid, solidifies abruptly with a rise of temperature. Thero is formed, doubtless, aniline gallate. If the mass is heated, we observe at about 120° a regular development of carbonic acid without appreciable rise of temperature. At this temperature the whole of the gallic acid may be decomposed. On heating to 180° and cooling, aniline pyro-gallate is obtained in long crystalline needles very instable. Most of the liquid aromatic amines form an equally favourable medium for the transformation of gallic acid. The melting point of pyrogallol is 132° (not corrected), and not 115°, as asserted in the text-books.

A Suggestion.—The appeal of the Secretary of the Photographers' Benevolent Association for subscriptions—and it is to be feared that, from the present outlook, they will be sadly needed—comes opportunely at the time when the different photographic societies are arranging their winter programmes. Now, the suggestion we would make, and we have made it before, is that each society should devote an evening to an entertainment amongst its members and their friends for the benefit of this deserving institution. There are something like two hundred and fifty photographic societies in the United Kingdom, and, if each were the means of raising only a pound, the income of the Association would be more than doubled. No apology is necessary for once more directing attention to the subject, we hope with better result than hitherto.

Do Plates Deteriorate by Keeping?—"Prevention" writes to *Nature*: "I have found great difficulty in obtaining fresh photographic dry plates of whatever maker from dealers, who frequently pass off upon the purchasers packets of plates which have been in stock for a long time, and consequently unfit for use. It has therefore occurred to me that this trouble might be avoided by the

makers dating every packet as issued by them, thus following the custom of the Platinotype Company with their tins of paper. By such a system the purchaser would be able to protect himself, and many makers' plates would be found much more satisfactory." Underlying "Prevention's" idea, which most business men will be inclined, for obvious reasons, to regard as impracticable, is the oft-exploded fallacy that fresh plates are preferable to old plates for no other reason than that they *are* fresh. Provided the method of packing employed is unobjectionable, it remains to be proved that plates (as "Prevention" alleges) "which have been in stock for a long time" are "consequently unfit for use."

Retouching and Bad Trade.—At a recent meeting of one of the metropolitan societies, where Mr. Redmond Barrett discoursed on retouching, one of the speakers in the discussion said that he thought that, on the whole, retouching had been a great affliction to photography, and was the cause of the great depression in photographic portraiture. This statement will take many by surprise. Where is the photographer who would think of submitting a portrait if the negative had not been more or less dealt with at the hands of the retoucher, and what would be the result, from a business point of view, if he did? It is quite true that retouching has tended to the deterioration of the technics of photography, as now many negatives are passed which would be worthless but for the retoucher. The question is, however, one of demand and supply. The public demand highly retouched portraits, and the enterprising professional supplies them. In most instances it is simply a matter of £ *s. d. versus* rough truth. Attempting to educate the public, a well-known portraitist recently remarked to us, is not remunerative. It likes to be flattered, and is accommodated, adding, "We are not like the Chinese artist, who, when called upon to paint the miniature of an English lady, put the following query: 'Ladee, likee likee, or likee beautiful?'" We take the latter for granted. We fear that the cause of the depressed state of portrait photography must be sought for in another direction than retouching.

CONTACT PRINTING.

How simple, and yet how little understood by the great bulk of those who are daily to be found resorting to this method of producing lantern slides from their negatives.

Contact printing is generally understood by a great many who are not only beginners, but also by old and experienced workers, to mean the mere placing of a sensitive plate in contact with (or portion of) a negative for the purpose of printing a positive picture, and, doubtless, owing to the extreme ease of such procedure, the entire operation has come to be looked upon as one requiring little thought or akill on the part of those who are conducting the operation. It generally resolves itself into placing the two plates in contact in a printing frame, turning up a naked gas-flame at an ordinary gas-jet, holding the frame at an uncertain distance from the light (the proper distance generally being considered to be about twelve or fifteen inches from the flame), then to develop, and in ninety-nine cases out of a hundred trusting to luck for the results being up to the mark.

Such is, no doubt, the *modus operandi* followed by hundreds, if not, indeed, thousands of amateurs who take no small amount of pride in showing off their handiwork. True, some little thought on the surface of the operation seems to be bestowed on the question of how many seconds exposure ought such and such a negative to get, but otherwise the operations are very much as I have mentioned.

Now, this is not contact printing as it ought to be conducted, and is just about as careless or thoughtless a way of conducting the operation as it is possible to conceive; but, nevertheless, it is just a point where those who have not had the benefit of learning a trade or profession begin at the wrong end of the stick, or, in other words, attempt to learn an occupation by working downwards, instead of beginning at the bottom and working upwards.

Contact printing, properly understood, is not the simple matter that many suppose it to be, and I sometimes think that more thought and consideration is required in practising it than in very many other branches of photography. Doubtless, in many respects, such printing closely resembles numerous points that have to be observed in ordinary daylight printing, such as when albumenised paper is being employed in an ordinary printing-room of the studio (and perhaps the printing-room, all being considered, is the most important corner of any studio), and not, as many suppose, merely a secondary consideration in a photographic business. I look upon the head printer in an establishment as king over all others employed.

Now, what is the very first act of a printer who has sent up to him a batch of negatives to print? Certainly not hurrying such off into the printing frames, placing in contact with the paper, and without giving any heed or consideration to this or that particular feature in a negative, placing them all out to print in exactly the same light and under exactly the same conditions. Such is not the way an experienced printer sets about his work. He knows better than to follow such a happy-go-lucky style. With him each negative is taken singly and minutely examined, first for the merest flaw possibly overlooked by the retoucher. Then these are assorted into different classes; such-and-such must receive quite different treatment to those others—in fact, they are all subjected to a close scrutiny, and very possibly some may be printed upon paper of varying qualities depending upon their densities. Others, again, require thoughtful consideration in the way of being printed through varying depths of shields, sometimes ground glass or tissue paper; others, again, have to receive very careful attention in printing by being judiciously dodged—in fact, a printer's occupation is no sinecure, and, if such is necessary in the practice of slow or daylight printing, how much more so is it when such rapid work as contact printing by after development is being followed?

Here we are face to face with negatives of ever-varying density and colour, not two of which print alike, yet still, as we have seen, the common practice is to expose all such twelve inches from a naked flame; some, perhaps, a few seconds less or more than others, according to their appearance of density. Now, if the best results are to be obtained by contact printing, it certainly is not by following such a slip-shod method of working.

First in importance comes the nature of the light to be employed. Gas is perhaps, all being considered, the best light to employ, but certainly such should never (or very rarely indeed, if ever) be used as a naked flame. Let a beginner who cares to enter fully into the pleasures of contact printing begin by carrying out a few simple experiments on the following lines:—

First, let him provide an ordinary bat's-wing burner fitted to some suitable gas-bracket or stand, that will enable such to be placed on an ordinary kitchen-table, the centre of the flame when placed in a fixed position being about six inches from the bottom. Let the light be turned up at its best. Next, let him take the thinnest negative that he can obtain, and proceed to make an exposure after the method described, viz., by holding the frame in his hand for a certain number of seconds, judged to be about the correct exposure; then let the plate be developed, and it is just about a hundred to one the result will be declared not good, bad, or very likely useless. Why? Because a very thin negative has been employed, and the light used has not been suitable for such, neither have other necessary conditions been followed (conditions which I hope to allude to later on).

It is interesting to follow what would have been the procedure with such a negative were it placed in the hands of an experienced printer for daylight prints. Certainly such a negative would never have been placed out to print in the full blaze of sunlight, or diffused light either for that matter, without having received some shielding from tissue paper or ground glass. And why such treatment? Simply because an over-powerful light would completely drown, in this case, the meagre gradations of the negative, or, in other words, the denser and thinnest portions of the negative would go on printing in equal proportions simultaneously. To prevent this, the common practice of shielding, or of employing a weaker light to print does much in the way of permitting only just the correct amount of light being used as will permit of the denser portions of the negative being much more slowly printed than the thinner portions. When such is the method employed, a fair amount of contrast will be obtained—a result quite impossible to get when too much light is employed.

This is the first and most important principle to grasp in contact printing, and, once it is understood and acted upon, a marked improvement will be noticeable in the results turned out.

I veritably believe that every negative has a special light of its own, that is best suited for its peculiarities.

Bearing this in mind, next let the beginner take the same negative and proceed to print it under different conditions. Let him try the result of placing in front of the naked gas flame, at a distance of, say, six inches, a sheet of ground glass; then let the printing frame containing the negative and a similar plate in contact as was previously employed be reared on end at a distance of, say, two feet from the flame, and let the same exposure be given as previously. Now let the plate be developed by any formula the working of which is best known to the operator, and judge of the difference in the results. Very possibly a decided improvement in contrast will be the outcome

of even this the first experiment. If the plate develops up somewhat rapidly, it is but safe to conclude that still better results can yet be obtained; therefore proceed again, but this time turn down slightly the light, giving the same exposure and at the same distance, and further, when developing, add a grain or two more pyro (I am a firm believer in pyro for developing lantern slides), and a drop or two of bromide; watch closely on development. This time the picture will very likely come along more business-like, and an amount of contrast or building up of gradation obtained far and away in advance of anything ever dreamt of as being possible of attainment from such a negative. Doubtless, also, much power for good lies in the manner in which such an exposure be developed. Here we have a great power at hand.

Thin negatives, as a rule, require extra pyro and bromide, and when such are made to dovetail with exposure to just the correct amount of light, and only a very slow plate is employed, it is quite wonderful what results are obtained from negatives from which many are unable to obtain even passable results.

So much for the treatment of a thin negative. Now let us take the case of a very dense one. Here we have almost exactly opposite factors to work with. In the former case the high lights (dense portions of the negative) printed up too rapidly; now it will be the reverse. Provided the same conditions of lighting and distance be employed, the high lights will not print up in anything like the same time as the less opaque portions of the negative; in fact, it is just possible to employ such a weak light that would never penetrate through even some of the middle tints of a negative. Therefore, a more powerful light must be brought into play in such a case, and in very extreme cases of density a very rapid bromide plate will be found to yield even better results than a slow lantern plate, for in this case the chief aim is to keep down contrasts. I notice that rapid lantern plates are now on the market; doubtless these will be very useful in many ways, especially when negatives have to be reduced through the camera by artificial light.

In cases, therefore, of extreme contrast in negatives, the full flame of the gas-jet may be employed, always using the ground-glass intermediate screen, and frequently the frame containing the negative or plate may, with advantage, be brought much nearer to the light, and a weaker developer employed; by such means extreme contrasts will be avoided.

Contact printing, when properly understood and conducted, will often yield very good results, but at no time, in my opinion, ought such to be employed if the work is capable of being produced through the camera. I have repeatedly had cases of want of sharpness brought under my notice that were clearly attributable to uneven glasses, and sometimes, also, from faulty manipulation, by the printing-frame not being held steady during exposure. When such were printed through the camera, it was surprising to witness the great difference in sharpness of the slides.

Another oversight in the practice of contact printing is the non-employment of a suitable frame for printing in, and, in many cases, the non-preparation of a negative for a particular class of printing.

T. N. Armstrong.

AMERICAN NOTES AND NEWS.

A Real "Detective" Camera.—An alleged pickpocket, we read, recently arrested in Hartford, Conn., made it so difficult for a photographer to take his picture, that the officers hit upon the happy expedient of having a snap-shot taken, unknown to him, while walking through the street. The amateur who performed the operation succeeded in getting an excellent picture of the prisoner and of the officer who was with him. Needless to say, this happy result was not placed on exhibition in the rogues' gallery.

Starch as a Mountant.—"After many years' practice in photography," says Dr. Ellerslie Wallace in the *American Journal of Photography*, "and close watching of the behaviour of prints mounted with different substances, I feel perfectly safe in recommending simply starch well boiled in preference to anything else. I have been greatly disappointed in the permanency of prints mounted with gelatine in any manner, either upon cards or upon glass. Solutions of gelatine with alcohol are elegant preparations for mounting, and work very smoothly under the brush: the only drawback is the very serious one of affecting the permanency of the print. Mountants containing glycerine are even more to be feared, from the fact that glycerine always attracts water, and is sure to retain any dampness present in the print, even if the latter is seemingly quite dry."

The Hardening Effects of Chrome Alum.—According to Wilson's *Photographic Magazine*, Dr. J. J. Higgins, of Philadelphia, renders gelatine negatives absolutely insoluble with chrome alum "in proper combination." Immediately after fixing, it is said the plate can be freely flushed with boiling hot water without the least danger of its slipping or removal from the glass support, or affecting the image in any way. This remarkable phenomenon all hinges, we suppose, upon the use of alum in "proper combination." whatever that may be.

Departure of Miss Catharine Weed Barnes.—Miss Catharine Weed Barnes sails for New York on Saturday next by the Inman liner, *City of New York*. In taking leave of her a few days since, we were glad to hear that, although during her stay in this country she had accomplished an immense amount of photographic work, her visit had proved most enjoyable to her.

The Canadian Photographic Exhibition.—The first meeting of the Annual Convention of the Photographic Association of Canada was held on September 8, in Toronto. Over $495 in gold, besides trophies, &c., were offered for competition. Many of the principal American firms "donated prizes," and we read that the exhibits afforded an interesting proof of the rapid progress, in nearly all branches of photography, which has been made in comparatively recent years. Before the business meeting closed, Mr. Knowlton informed the members that the Stanley Dry Plate Company, Montreal, which he represented, would raise their donation from $100 to $250 for next year. Mr. Anderson, for the Eagle and Star Plate Company, caused some amusement by saying that he would go Mr. Knowlton ten cents better. American manufacturers are enterprising men of business!

A Difficult Sitter.—"Perhaps," says *Anthony's Bulletin*, "one of the most unusual subjects to be photographed, of which we have read, is a large South African crocodile, which was surprised by a party from one of the missions there while out on a sporting tour, and photographed by Mr. F. Moir. We may say that Mr. Moir was ably seconded by four native blacks, who assisted the subject to sit, as without their services he would have run off the plate before he could have been 'taken.'"

A Retouching Medium for Albumen Prints.—On the authority of the *Photographic Times*, a very good retouching medium for albumen prints is made by macerating half an ounce of soap bark (*Quillaija saponaria*) for two hours in boiling water. After filtering the infusion, add four ounces of alcohol and a quarter of an ounce of salycilic acid. When applied to albumen prints, Indian ink and water colours take well to the glossy surface.

The Photographic "Globe Trotter."—Our old friend, W. K. Burton, has a word or two to say on this subject in the pages of an American contemporary, to which he contributes a gossiping collection of "Notes from Japan." "Of the globe-trotting amateur," he says, "we have enough and too much at various times of the year. He is often an unmitigated nuisance; he knows little or nothing of photography, but has some hand camera or other with which he goes snapping about indiscriminately; he comes with a note of introduction or without: he has made 40 or 400 shots—'quite interesting, you know,' and 'would like to see what they are like.' 'Would you mind developing them for him?' . . . . This is one kind of the species. There is compensation for the multitude of him in the occasional arrival of an old friend, of one known by reputation, or of one whose fondness for knowledge of photography makes it a pleasure to talk with him. Especially delightful is it to us if a man comes from any of the far-away countries with all the gossip—nay, the slander—of the societies and clubs, the things that do *not* get into any of the photographic periodicals." Now, now, Professor!

YELLOW FOG.

The cause of yellow fog, says the *Photographic Times*, is now well ascertained. It is a dyeing action which occurs with pyrogallol, hydroquinone, and eikonogen, by using old oxidised solution, or by long development, the reagent being then in a state of oxidation. There are also other causes which influence the defect in question, but they are not known with certainty.

Sodium sulphite counteracts this phenomenon.

Washing in a solution of tartaric, citric, or oxalic acid, &c., before fixing, prevents the fog from occurring in the sodium thiosulphate (hyposulphite) solution.

Yellow fog can be removed before or after fixation. It can also be removed during the fixing process by the use of the so-called acid bath, one compounded with acid sodium sulphite.

To remove it before fixing, prepare the following solution:—

Sodium sulphite	1 ounce.
Alum	1 „
Hydrochloric acid	160 minims.
Water	8 ounces.

In this the plate, developed and washed, is immersed for a period of three or four minutes, then fixed in a bath of sodium thiosulphate at 1:4.

To clear the negative after fixing is often a difficult operation. Of all the processes which were published, one of the best is that recommended by Mr. E. Garbe. According to the author, it is based on the action of nascent sulphur dioxide generated by the influence of air and moisture on sodium thiosulphate. We think, however, that the decolouration is due to another cause, for the sodium salt, in the circumstances in question, is decomposed thus:—

$$Na_2S_2O_3 + H_2O = Na_2SO_4 + H_2S.*$$

* This we give on the authority of Wurtz. If sulphurous acid is formed, then the action should be represented as thus:—

$$Na_2S_2O_3 + O_3 + H_2O = Ns_2SO_4 + H_2SO_3.$$

Whatever it may be, here is the process of Mr. Garbe, described by himself in the *Photographic Gazette*:—

We prepare the mixture following:—

Glycerine and water, equal parts, in which is dissolved in the cold sodium hyposulphite to saturation (from forty to fifty per cent.).

This mixture is spread with a brush on the yellow negative, then the plate is set aside on a level surface, sheltered from the heat and dust. According to the intensity of the colouration, the yellow tint infallibly disappears in a more or less long period, which may vary from one to twenty-four hours. Here again, it is the *nascent* sulphurous acid which acts in consequence of the oxidation of the hyposulphite in contact with the air. This is so much more evident that the same negative is not discoloured if immersed in a bath of hyposulphite, because the action of the air does not exist on the surface of the negative.

The means which we speak of have already been indicated, but with a solution of hyposulphite in water only, and it happened that from the evaporisation of the water incrustations were formed on the surface of the gelatine film. The object of glycerine is to increase the proportion of hyposulphite dissolved, and to prevent the crystallisation even after a very long period.

By this process we have decoloured negatives which were so yellow that one could hardly see the image, and which were dry for more than two years.

SIMPLE CHEMICAL ANALYSIS.

[Holborn Camera Club.]

The subject on which I am going to speak this evening is one, I think, which should be of interest to all working photographers. The knowledge of chemical analysis to a photographer is a powerful weapon to fight the many difficulties in which the path of photography runs. And, again, this knowledge will give him the means to enable him to test his tools by which his work is produced. (In reference to tools here, I mean such solutions as may be used to produce certain results.) It is, I think, needless for me to dwell upon the many advantages which will arise to those who have the power of being able to detect any of the substances which they may use in their work. It will therefore be my endeavour to show you that this subject is not one which is beset with any great difficulties, but is one which is quite capable of being manipulated by any one who possesses an average amount of intelligence.

Hints to Tyros.

I will now proceed with a few short notes, which will be found of use to those who have not done any of this work before:—

(1) When adding a reagent to a solution and a PP* is formed, be sure to add sufficient of the reagent to insure that the whole of that particular substance is thrown down.

(2) Do not hurry therefore if a certain effect is not produced immediately. Do not imagine that the particular substance you are testing for is not there. Some reactions are at once apparent, and others take some little time.

(3) In commencing analysis, always analyse some substance, the composition of which you are aware, and note the effect produced by this of certain defined reagents.

(4) Always test an unknown substance for the base or metal first, and then for the acid which has combined with it. For example, in sodium chloride, the sodium is the base, and the chlorine is the acid which has combined with it. When you have detected the base of an unknown substance, this will give you some idea as to what acid it belongs.

(5) Always confirm the result given by one reagent by testing with another reagent for the same substance. For example, in adding a solution of $BaCl_2$ to an unknown solution, you may get a PP soluble in HCl, and yet it may not be a sulphite; therefore you must confirm the fact of its being a sulphite by the granulated zinc test.

(6) To test with borax beads, place a little borax on the loop of your platinum wire, and hold same in the Bunsen flame; it will boil up, and then fuse to clear glass. Now place a little of the substance to be tested on the bead; heat same, and allow to cool; then notice the colour of the bead. If the colour of the bead is too dark to make out the exact colour, add more borax and heat again; this will lighten the colour of the bead. Chromium is about the only element in every-day use in photography which gives a characteristic colour to the borax bead.

(7) The following is the method of using the platinum wire for flame tests: Hold the wire in the Bunsen flame until it ceases to give the intense yellow colour, then place a little of the substance to be tested on the wire, and hold it at the lower edge of the flame. Sodium gives a very strong yellow colour to the flame; potassium gives a pale lavender colour.

To make a platinum test-wire, take about two inches of platinum wire and double the same in half, then twist together, so as to leave a small loop at one end. Mount this in a small piece of glass tube, so as to form a handle. Taking a test-tube of about half an inch diameter, you fit a cork to it, and make a hole in the cork large enough to take the glass-tube handle. Push the handle through the hole in the cork, partly fill test-tube with weak hydrochloric acid, and, by putting the cork in the test-tube, you have your platinum wire always clean and ready for use.

Apparatus.

The following are the apparatus required for practice of analytical work: test-tube stand, test-tube brush, twelve test tubes, 5 × ½, six test-tubes on feet, one test-tube holder, spirit lamp or Bunsen burner, wash bottle, two small evaporating dishes, two small glass funnels, one packet of filter paper, three inches of platinum wire, two watch glasses, one nest of small beakers, retort stand, one piece of wire gauze, one piece of charcoal, and a blow-pipe. This may seem rather a long list; but, as the whole of the apparatus can be purchased for something like ten shillings, the list is rather more lengthy than expensive.

Reagents.

We will now pass on to the various reagents that we shall require:—Acetic acid, 1 oz. to 1 oz. of water; ammonia, 880 s.g. diluted with about twice its bulk of water; hydrochloric acid, strong; hydrochloric acid, dilute ½ an oz. of acid with 1½ ozs. of water; sulphuric acid, strong; sulphuric acid, dilute, ¼ of an oz., is made up to 2 ozs. with water; nitric acid, strong; nitric acid dilute, ½ an oz. to 1½ ozs. of water; ferric chloride, 20 grs. to 2 ozs. of water; lead acetate, 20 grs. to 2 ozs. of water, and a little acetic acid; barium chloride, 60 grs. to 2 ozs. of water; silver nitrate, 20 grs. to 2 ozs. of water; potassium ferricyanide, 20 grs. to 2 ozs. of water (this solution should be made up as required, as it does not keep); potassium ferrocyanide, 20 grs. to 2 ozs. of water; potassium iodide, 20 grs. to 2 ozs. of water; caustic soda, 40 grs. to 2 ozs. of water; ½ oz. of platinum chloride; lime water; a piece of lime about the size of a walnut should be well shaken up in about 10 ozs. of water, allow to settle, and decant the clear liquid off. With the following dry reagents in wide-mouthed bottles:—ferrous sulphate, sodium carbonate, black oxide of manganese, granulated zinc, together with some red and blue litmus papers, starch and lead papers, and a little borax.

* For explanation of abbreviations see end of paper.

The Detection of Bases.

1. *Silver and Lead Salts.*—All give a white PP when treated with HCl. Add ammonia, if silver PP will dissolve. If the PP is lead, on boiling the solution the PP will be dissolved. Sodium hydrate also dissolves the lead P P.

2. *Mercuric Salts.*—(*a*) Sodium hydrate, when added in excess, gives a yellow PP, soluble in HCl. (*b*) Pot. iodide gives a yellow PP, which changes to a bright red. This PP is soluble in excess of pot. iodide or mercuric salts. (These mercuric salts must not be confounded with the mercurious salt, which gives a white PP with H Cl, which is blackened on the addition of ammonia.)

3. From *Ferric Salts.*—(*a*) Pot. *ferric*yanide give a dark-blue PP, (*b*) sodium hydrate and ammonia a brown PP.

4. From *Ferrous Salts.*—(*a*) Ammonia hydrate gives a light colour green PP, which turns a dirty green and afterwards a reddish brown. (*b*) Pot. *ferro*cyanide gives a blue-green PP, which afterwards turns to a dark blue. (*c*) Boil a ferrous solution with a few drops of strong HNO_3. The liquid becomes black, effervesces, and, turning yellow, becomes changed into the ferric condition.

5. *Sodium Salts* give no PP with platinum chloride, but give the Bunsen flame a very intense yellow colour, which is quite characteristic of sodium.

6. *Potassium Salts.*—(*a*) Place a watch-glass on a piece of white paper, and place a little of the liquid to be tested on it; then add a few drops of platinic chloride and a few drops of alcohol. After a few minutes a yellow PP will fall if the solution is not too dilute. If no PP falls, allow it to rest for half an hour, giving the solution a stir now and then. (*b*) Potassium salts also impart a lavender colour to the Bunsen flame. This colour is not very intense, as the sodium in the air always gives the flame a little yellow colour, which tends to overpower the light colour of potassium. A piece of cobalt colour glass is sometimes used to cut off the sodium flame.

7. *Chromium Salts*:—(*a*) Treated with lead acetate give a yellow PP. (*b*) With silver nitrate a deep red PP is given which is soluble in HCl. (*c*) Chromium salts also give an emerald green borax bead when heated in the outer or inner flame.

The Detection of Acids.

8. *Acetic and Acetates.*—(*a*) Ferric chloride in neutral solutions produces a dep red colour, which, on the addition of HCl, turns yellow. (*b*) On boiling the red solution the iron is PP as a basic acetate, and the liquid becomes colourless.

9. *Citric and Citrates.*—(*a*) A fairly strong solution, if mixed with H_2SO_4 and heated, will blacken, and, if evaporated down, will leave a black syrupy residue. (*b*) Will also PP lead acetate soluble in HNO_3.

10. *Oxalic and Oxalate.*—(*a*) Barium chloride gives a white P P soluble in HCl and HNO_3. (*b*) Silver nitrate gives a white PP soluble in HNO_3 and ammonia.

11. *Hydrochloric and Chlorides.*—(*a*) When treated with silver nitrate it gives a PP which is soluble in ammonia. The P P turns violet if exposed to light. The PP is insoluble in HNO_3. (*b*) See test (1) for lead.

12. *Nitric and Nitrates.*—Take a weak solution of a nitrate, and add equal bulk of a solution of ferrous sulphate in a test-tube. Hold the tube at an angle of about forty-five degrees, and carefully pour down the side of the tube a few drops of strong H_2SO_4. After a few seconds a brown ring is formed at the junction of the two liquids. After it has begun to form, a little gentle shaking assists the formation of same. This is a very delicate test.

13. *Sulphureous Acid and Sulphites.*—(*a*) Barium chloride produces a white PP soluble in HCl. (*b*) Put into a test-tube some granulated zinc, add HCl, let it effervesce, then pour some of the liquid to be tested into the tube. The gas H_2S will be given off, which may be detected by the smell and by its power of turning lead paper black.

14. *Sulphuric Acids and Sulphates.*—(*a*) Barium chloride gives a white PP insoluble in HCl. (*b*) Powder a little of a suspected sulphate and mix with equal parts of powdered charcoal, stir into a paste with a little water, and place the mixture on a piece of charcoal. Heat in the reducing flame for a few moments and take a little of the residue, powder it, and place on a bright silver coin. Add a drop of water, and, if the substance tested was a sulphate, a brown-black stain on the coin will be the result.

15. *Carbonic Acid and Carbonates* (CO_3).—Carbonates, when treated with HCl evolve CO_2 (carbon dioxide). If this gas is led into a vessel containing clear lime water, and allowed to bubble through, the lime water will become milky, and a P P of calcium carbonate will be formed.

16. *Bicarbonates* (HCO_3).—The bicarbonates or hydric carbonates give off carbon dioxide on boiling solutions of these acids. The solids dissolve in boiling water with effervescence. The carbon dioxide may be detected as in the last test.

17. *Thiosulphates.*—(*a*) On adding HCl to a solution and gently warming, a P P of sulphur will fall, with a smell of sulphur dioxide. (*b*) Silver nitrate gives a white P P soluble in HNO_3. This P P is blackened on heating.

18. *Bromides.*—(*a*) On heating with H_2SO_4 and black oxide of manganese evolve bromine, which may be detected by its red colour and its power of turning starch paper yellow. (*b*) Will also P P silver nitrate, insoluble in weak HNO_3 and soluble in ammonia.

19. *Iodides.*—(*a*) Heat as with last test a mixture of H_2SO_4 and manganese, and hold a piece of wet starch paper in the tube. The paper will be coloured purple if iodine is there. (*b*) Iodine will also P P silver nitrate almost insoluble in ammonia.

20. *Ammonium.*—(*a*) All ammonia salts can be volatilised. For example, place a little of some ammonia compound in the end of a long test-tube, heat it, and a sublimate of ammonia will be formed at the other end of the tube. (*b*) To test a solution for ammonia, add caustic soda, heat gently, and ammonia is given off, which may also be detected by its action of turning wet red litmus blue. White fumes will also be given off if an open bottle of HCl is brought near.

21. *Ferrocyanides.*—(*a*) Silver nitrate gives a white P P insoluble in HNO_3 and ammonia. (*b*) Ferrous sulphate gives a P P of blue green.

22. *Ferricyanides.*—(*a*) Silver nitrate gives a P P of orange red, soluble in ammonia. (*b*) Ferrous sulphate gives a deep blue P P, soluble in sodium hydrate.

23. *Cyanides.*—(*a*) Silver nitrate gives a white P P, insoluble in HNO_3, soluble in ammonia. (*b*) Silver cyanide, when heated to red heat, is reduced to metallic silver.

I will now conclude with a brief review of the manner to go to work to detect any of the ordinary chemicals that may be found on a photographer's work-room shelf.

If the substance is a solid which you wish to test, dissolve about twenty grains of it in a test tube with about one ounce of distilled water. This solution is called the original solution. We will now proceed to test for the base. Before, however, proceeding to test the solution of the chemical, place a little of crystal on the platinum wire and heat in the Bunsen flame. Note the colour it imparts to the flame. Now we will proceed to test the solution. Take about one drachm of the original solution, pour into a test tube, and add a little dilute HCl. If you get a PP it may be lead or silver (1). If you do not get any PP, add to another portion of the original solution some ammonia sulphite. A PP in this case indicates iron (3 and 4). If no PP forms, take a few drops of the original solution, and use test for potassium (6). Then test for chromium and mercury (2 and 7). After having found the base, you must then test for the acid which is united with it. The knowledge of the base will give you some idea as to what acid you may expect. It is as well to always use fresh portions of original solution for every separate test you make.

In conclusion, I would ask every photographer who likes a little experimental work to give chemical analysis a trial, and I am sure that he will not only find the same very valuable in his ordinary photographic work, but also a source of pleasure independent of photography. I think an apology is due to you for the rather curious way this paper and tests are arranged. I will ask you to excuse me on the grounds that my aim in the paper has been to make it as simple as possible, and to avoid introducing those chemicals which are very seldom, if ever, used by the ordinary run of photographers. To those who wish to go into this subject deeper and in a thorough chemical manner, I can recommend the following works:—*Analysis of a Simple Salt* (price 2*s.*), published by Cliva & Co.; *Practical Chemistry*, by Tilden (price 1*s.* 6*d.*), published by Longman Green, & Co.; *Qualitative Chemical Analysis*, by Thorpe and Muir (price 3*s.* 6*d.*), published by Longmans; and a far more elaborate and difficult work, *Valentine's Analytical Chemistry* (price 7*s.* 6*d.*), published by Churchill. The following abbreviations have been made use of in the paper.

PP for ..... Precipitate HCl for ..... Hydrochloric Acid
HNO_3 ..... Nitric Acid H_2SO_4..... Sulphuric Acid.

Ernest Benest.

MYSTERIOUS MARKINGS ON NEGATIVES.

In your leading article under this heading last week, when speaking of those cases where fogging was traceable to the dark slide, you say: "As in all wooden shutters mahogany is employed, it can scarcely be imagined that it would exhale anything that would act injuriously

on the bromide film. Hence, if the evil arises from pernicious fumes they must be sought for in the material with which the inside of the shutter is blacked;" and in the two following paragraphs, that when fog only appears on those parts of a negative opposite the wood of the shutter, and the hinge has formed a protection, it is more probable that it is due to the shutters affording insufficient protection to a highly sensitive plate against a prolonged exposure of the slide to a strong light than to exhalation.

Having been occasionally troubled with mysteriously fogged plates for a considerable time after commencing to use a new whole-plate camera, I venture to submit the following facts to you, as they justify the conclusion that fog may be caused by the wood of which the shutter is made, although this may be well-seasoned mahogany.

The camera being frequently used under conditions that severely tested its safety, giving negatives perfectly free from fog, rendered it somewhat difficult to trace the cause, as the real origin of the trouble was not suspected until a plate showed a decided line corresponding to the hinge of the shutter, that part of the negative that had been against the wood being badly fogged, while that that had been opposite the hinge remained perfect. A series of tests were made, with the following results:—

The slides were perfectly light-tight under all reasonable conditions. They were filled with plates, and left out of doors for three hours in the brightest light possible, without allowing the sun to shine directly on them, on a clear day in August. Although the plates were subjected to a prolonged and strong development, they showed no trace of fog.

The plates were fogged if left for any length of time in the slides, though they were kept in the dark. The slides were filled, wrapped in several thicknesses of black material, and put away in a wooden box for three days. On development the plates were decidedly fogged. Others left for seven or eight days under identical conditions were very badly fogged.

The blacking, which consisted of a mixture of French polish and lampblack, was not the cause of the fog, as *only one shutter was blacked*, the other five having been left with the plain surface of the wood inside, simply smoothed with glass paper, and *all fogged about equally*. All the six shutters were made from one piece of wood, and, though the plates were fogged over their entire surface, they were worst at the part corresponding to one side of the plank, as traced by comparing the grain or "figure" in the shutters. The plates of one maker were more affected than those of another, though they were of equal rapidity.

It having been found that an ordinary coating of polish and lampblack afforded scarcely any protection whatever, it was considered necessary to adopt a far stronger remedy. After each shutter was made slightly thinner, a sheet of tested non-actinic paper (that used by Messrs. Wratten & Wainwright for packing their plates) was affixed with very thin glue, and three or four liberal applications of French polish were made with a small sponge at intervals of several days, the shutters being kept well exposed to the air in a warm, dry room. By this method the polish soaked well into the porous paper and wood, and dried with a very hard and fairly dull surface. There is not the necessity for a perfectly dead surface in a slide shutter as in the body of the camera.

Although this remedy sounds clumsy, it is not really so. The surface of the paper is so thoroughly protected by the polish, that twelve months' frequent use has not produced the slightest abrasion. As a cure it is perfect; plates have been kept in the slides for three weeks, then under-exposed and forced in development, without the slightest trace of fog.

Unfortunately, there seems to be a new source of imperfect negatives to be added to those generally suspected and guarded against.

HENRY W. BENNETT.

ON THE METHOD OF EXAMINATION OF PHOTOGRAPHIC LENSES AT THE KEW OBSERVATORY.

[A Communication to the Royal Society.]

THE Kew Committee of the Royal Society decided, about a year ago, to undertake the examination of photographic lenses, thus adding one more to the already numerous list of tests and certificates issued by the Kew Observatory. Captain Abney was the member of the Committee who originated the idea, and he was requested to organize the system in detail. This he undertook to do, but unfortunately it proved that official duties and his work in connexion with colour vision, &c., made it impossible for him to give the necessary time to the inquiry. In consequence of this, I was asked by the Kew Committee, with the full acquiescence of Captain Abney, to give my assistance in the matter, which I gladly consented to do; eventually the arrangements developed almost entirely upon myself, acting in co-operation with Mr. Whipple, the Superintendent of the Observatory, and aided by consultations with Captain Abney; but I should add that as to the arguments and discussion in this paper I alone am responsible. A very considerable amount of time and energy was expended by Mr. Whipple and myself before the final recommendations could be made, but now, since the whole of the proposals have received the provisional approval of the Kew Committee, it is open to any one to get a photographic lens examined at Kew on payment of a small fee.

It is important first to state clearly the general idea which the Kew Committee had in view when they undertook this new work, for, if the methods adopted are judged from any other standpoint, they will, no doubt, be found open to criticism. The object of the Committee was to organize a system by which any one could obtain, on payment, an impartial and authoritative statement of the quality of a lens to be used for ordinary photographic purposes, and that the fee, which had to cover the cost of the examination, should be moderate. This latter consideration acted as a serious restriction, and it was consequently necessary that all the tests should give results of undoubted practical value to the practical photographer; the certificate of examination must be recorded in the way most generally useful, and in language which could not fail to be understood. A complete scientific investigation of a lens from every point of view would occupy so long a time as to make the necessary fee quite prohibitive, and, moreover, the results would contain much information which would be quite useless to the ordinary user of the lens.

There are undoubted advantages in testing a lens by the examination of negatives made by it, but it may be here stated, once for all, that the question of expense rendered it impossible, for the present, to adopt any photographic method; eye observations alone have to be relied on.

The form of entry is made to state for what special purposes the lens is intended, whether for portrait work, for landscape views, or for copying plans, &c. Every lens for photographic purposes is more or less of a compromise. Great rapidity, great perfection in definition, and power of covering very wide angles are incompatible qualities, and one or other of them must be sacrificed. It is therefore evidently unfair to expect different types of lenses to give equally good results under the same test; for, if we select a lens excelling greatly in one of these qualifications, we must deliberately abandon the expectation of its attaining the highest standards in the others. For example, in a portrait lens great rapidity is required; but, on the other hand, a less high standard of definition near the edges of the plate can be tolerated than with a landscape lens. No opinion could possibly be expressed at Kew as to the wisdom of demanding extra perfection or powers in any respect, and it is therefore necessary that the lenses should be, to a certain extent, classified by the parties sending them in for examination.

The smaller the aperture of a lens, the larger will be the field of sharp definition covered by it, and a complete study of a lens would tell us the size of the plate which is properly covered when each of the different stops is used. Considering the restrictions necessarily imposed on the work, such a lengthy examination could not possibly be thought of. Hence, when discussing the programme of tests to be applied at Kew, it was soon evident that the time devoted to the examination of each lens had to be limited by making the person entering it state either the number of the largest stop by which it should be judged, or the size of the plate for which it would be used; on the first supposition, the Kew certificate would have given the size of the plate which the lens covered satisfactorily with the named stop; and, on the second supposition, it would have indicated the size of the largest stop that could be used to give results up to a certain standard, or the rapidity of the lens in normal cases when used for the plate of the named size. The latter of these two alternatives has been adopted, because it is considered that the owner or intending purchaser of the lens will, in most cases, have already decided on the size of the plate he intends to use, and that what he wants to know is whether it is suitable for that plate or not. When further information is desired, the lens may be entered for examination for two or more sizes of plates.

The following is an example of the Certificate of Examination, the part in italics representing the result of the testing of the lens.

KEW OBSERVATORY, RICHMOND, SURREY.

Certificate of Examination of a Photographic Lens.

1. Number on lens, 3876. Registered No., 95.
2. Description, *landscape lens*. Diameter, 1·5 inches.
3. Maker's name, *A. B.*

4. Size of plate for which the lens is to be examined, 6·5 inches by 8·5 inches.
5. Number of reflecting surfaces, 4.
6. Centering in mount, *good*.
7. Visible defects—such as striæ, veins, feathers, &c., *nil*.
8. Flare spot, *nil*.
9. Effective aperture of stops.

Number engraved on stop.	Effective aperture. Inches.	*f* number.	C.I. No.*
No. 7·5	1·32	*f*/5·6	1/1·38
No. 10	1·19	*f* 9·5	1/1·12
No. 15	0·97	*f*/11·7	1·35
No. 25	0·75	*f* 15·1	2·26
No. 50	0·49	*f*/23	5·3
No.	...	...	...
No.	...	...	...

10. Angle of cone of illumination with largest stop = 68°, giving a circular image on the plate of† 13·2 inches diameter.
Angle of cone outside which the aperture begins to be eclipsed, with stop C.I. No. 1/1·38, = 20°, giving a circular image on the plate of 4·0 inches diameter.
Diagonal of the plate = 10·7 inches, requiring a field of 51°.
Stop C.I. No. 5·3 is the largest stop of which the whole opening can be seen from the whole of the plate.
11. Principal focal length, † = 11·28 inches. Back focus, or length from the principal focus to the nearest point on the surface of the lenses, = 10·4 inches.
12. Curvature of the field, or of the principal focus surface. After focussing † the plate at its centre, movement necessary to bring it into focus for an image 1·5 inches from its centre = 0·02 inches.

Ditto for an object 3 inches from the centre = 0·04 inches.
" 4·5 " = 0·10 "
" 5 " = 0·15 "

13. Definition at the centre with the largest stop, *excellent*. C.I. stop No. 1·35 gives *good* definition over the whole of a 6·5-inch by 8·5-inch plate.
14. Distortion. Deflection or sag in the image of a straight line which, if there were no distortion, would run from corner to corner along the longest side of a 6·5-inch by 8·5-inch plate = + 0·01 inch.‡
15. Achromatism. After focussing† in the centre of the field in white light, the movement necessary to bring the plate into focus in blue light (dominant wave length, 4420), = + 0.01 inch § Ditto in red light (dominant wave-length, 6250) = − 0·01 inch.§
16. Astigmatism. Approximate diameter of disc of diffusion† in the image of a point, with C.I. stop No. —— at —— inches from the centre of the plate = 0·—— inch.
17. Illumination of the field. The figures indicate the relative intensity at different parts of the plate.†

With C.I. stop No. 1/1·38.		With stop No. 5·3.	
At the centre	100 :	Ditto	100
At 3 inches from the centre	67 :	Ditto	82
At 5·35 " "	28 :	Ditto	66

General Remark.—An excellent medium angle rapid objective, practically free from distortion.—W. Hugo, *Observer*.
Date of issue G. M. Whipple, *Superintendent*.
Leonard Darwin, *Major, late Royal Engineers*.

(*To be continued*.)

THE GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC EXHIBITION.

The members of this flourishing Association have again brought together in their own rooms at 180, West Regent-street, a large and interesting collection of photographs, the work being confined to members only.

The Exhibition comprises both non-competitive and competitive classes. The latter are all well filled, and in the classes for landscape, transparencies, and enlargements, the work shown is of a high order, the weakest class, as usual with most amateur exhibitions, being portraiture.

The arduous duties of judging the collection was intrusted to Messrs. Robb, Young, and Annan, and with the exception of their decisions in the Landscape Class, about which there seems to be a pretty widespread opinion that a decided error has been committed, their decisions are satisfactory.

In the Landscape Class Mr. John Morison, jun., stands out pre-eminently with an exceedingly fine exhibit of six 12 × 10 pictures in sepia platinotype.

This year Mr. Morison has visited that charming spot, the Trossachs, and has succeeded in bringing home some exquisite results. He takes the silver medal for frame No. 20, which include three views, *Loch Achray and Ben Venue, Loch Katrine and Ben Venue, Achray Church and Ben Venue*. The centre picture is a gem, and is generally considered to be far and away the best picture in the Exhibition.

Other prominent exhibits of great merit in this Class are those of Mr. J. C. Oliver, Mr. Stuart Smith, and Mr. Hugh Reid. In the opinion of most members, the bronze medal ought to have gone to one of the above three, and not, as the Judges have seen fit to ticket, No. 5, a collection of three half-plate landscapes from the camera of Mr. Adam G. Brown.

Turning from the Landscape Class to the Instantaneous, Mr. Snell Anderson again takes the silver medal with a charming collection of marine views printed in platinotype. Mr. Anderson's individuality is in evidence in the three little gems which are to be seen in frame No. 31. The bronze medal goes to Mr. A. Lindsay Miller.

Perhaps the most interesting class in the Exhibition is the lantern slide exhibit, in which we notice there are about twelve exhibitors, all being of great merit, and the Judges must have had some trouble to distinguish among so much that is excellent. The first medal goes to Mr. Arch Watson, and Mr. A. Lindsay Miller secures the bronze medal. In this class Mr. Snell Anderson shows a very charming collection of marine views.

In the Enlargement Class Mr. Arch Watson secures the silver medal for the same set of pictures that he exhibits in the Lantern Slide Class.

The Portraiture is the worst class in the Exhibition, and, although numerous, does not contain a single exhibit of special merit.

The space of the entire walls and pillars of the large room of the Association is completely filled, and, on the whole, the work shows a distinct advance on previous years.

Profiting by the success which attended the recent International Photographic Exhibition in Glasgow, the funds of the Association were largely augmented by the substantial surplus. The Council have been enabled to provide increased facilities in the way of comfort and utility in the fitting up of these rooms, which are now, perhaps, unapproached by any other Association in the kingdom.

At the first meeting of the members for the ensuing season no less than twenty-six new members were added to the roll, and the council are acting in a liberal spirit towards the large number of members who now make up the Association.

Quite recently the dark room has been entirely refurnished, and now it offers facilities to the members, which we question if any other society can offer. By an arrangement of the House Committee members are not only supplied with every necessary utensil for the development of the tiny quarter-plate up to an enormous enlargement, but they have likewise always at their command a supply of the ordinary chemicals required in development; the duty of the House Committee being to see that such are always kept in stock for the use of the members.

We noticed an enormous overhead development lamp that must be of great use when working on large subjects—a lamp that any professional must envy.

We understand the judges could not agree as to the best picture in the room, and so they awarded two silver medals in the Landscape Class, the second going to Mr. John W. Eadie. Altogether, the Glasgow and West of Scotland Amateur Association is flourishing.

"NORTH HOLLAND IN GLASGOW."

Messrs. Annan have very fitly inaugurated the opening of their new premises in Sauchiehall-street, by an exhibition which is somewhat out of the ordinary run of exhibitions, and one which, in many respects, may be considered unique. The results of a joint holiday ramble in North Holland are here gathered together, one artist giving his impressions of that quaint country by a series of etchings, while the other gives his through the medium of the camera. Mr. D. Y. Cameron, the well-known etcher, is responsible for the former, while the photographs are the work of Mr. J. Craig Annan. The collection contains some seventy-five examples, etchings and photographs being grouped alongside of each other. Mr. Annan worked chiefly with the hand camera, quarter-plate size, and the pictures thus obtained have been reproduced (enlarged) in

* C.I.—International Congress System.
† The lens is focussed on a very distant object.
‡ The sag or sagitta here given is considered positive if the curve is convex towards the centre of the plate.
§ Positive if movement towards the lens, negative if away from it.
‖ The lens is supposed to be perfect in other respects.
Note.—The following is the scale of terms used: excellent, good, fair, indifferent, bad.

autotype. It may safely be said that this is the first occasion on which photographs and etchings have been brought into such close relationship, and a very good opportunity is thus afforded how far photography can compete, if such a term can be applied.

After a careful inspection of the collection, the conclusion is forced upon one that photography, at all events, can hold its own. It goes without saying that artistic work in photography can only be produced by one having that innate feeling which suggests how and when a genuine picture is to be secured. The works shown by Mr. Annan abundantly testify to the fact that he possesses this faculty, and that in no ordinary degree.

Where all are so good it is difficult to single out specimens, but *A Utrecht Pastoral* (38), a truly characteristic Dutch landscape, is particularly fine. The high trees on one side of the picture, the sheep trotting along the road, the canal, and the grand masses of cloud all go to form a most pleasing whole, free from that hardness which is so often seen in photography. *Fishers and Wives* (40), an animated shore scene, where the disposition of the various baskets has helped the artist to no small extent. Another picture well worthy of notice is *Labour-Monday* (42). Here we have a phase of peasant life treated after the manner of Millet—three labourers hoeing in a field. *On the Nord Holland Kanaal* (12), the effect of swirling water in the foreground has been most happily rendered. Another curious effect of broken or rather disturbed water is to be found in the picture, *Reflections on the Rokin Gracht* (17). Dutch dogcarts, groups of peasants, scenes in the various markets, all the different phases of outdoor Dutch life have been faithfully and artistically portrayed by Mr. Annan.

A word remains to be said regarding the framing. Several of the pictures square in size have been surrounded by a square, flat, broad frame, the whole carrying out the idea of a Dutch tile. If the picture is printed in Bartolozzi red, a frame of material resembling ivory surrounds it. The variety of the tones employed in the reproduction of the pictures lends additional interest to this most interesting cabinet collection; greens, browns, reds, are all intermingled, so that there is a complete freedom from anything like monotony. *Near Ijminden* (54), a view on the beach has been printed in autotype, and the grey-green tint employed is particularly well adapted to the subject depicted. In addition to the pictures on the walls, a large series of photographs printed in platinotype are to be found lying in an album on one of the tables. The exhibition reflects great credit on the originators, and is well worthy of a visit from all interested either in photography or in art. A neat and artistic catalogue has been compiled for the benefit of the visitor.

TWO CONVENTIONS.

The British Convention, or, as its organizers prefer to call it, "The Photographic Convention of the United Kingdom," meeting in Edinburgh, has been, says "Watchman" in the *Beacon*, according to the unanimous opinion of the British press, not only the most successful of the seven, but a thorough success in every way. Comparisons, according to Mrs. Partington, are odorous, but duty will not let us overlook one question. Why is it that the great success of what should be the great American gathering, the Photographers' Association of America Convention, is generally confined to preliminary boasting of what will be, while that of its British sister, or more correctly, daughter, is realised as an actual fact? The British has been a great success in everything that goes to make a successful Convention at an expenditure of less than $200, while the Photographers' Association of America, at a cost of about twice that number of thousands, has been—well, not a great success.

Is it not just possible that the difference arises from the different ways in which the Executive of each goes to work? In the British there are no paid officers, and as all the work is a labour of love, every member puts his shoulder to the wheel as if its motion depended on his efforts. The authorities in the cities in which the meetings are held, recognising the non-commercial nature of the Convention, and appreciating the influence of photography as an educational agent, give the free use of the most suitable buildings under their charge; there are no medals or awards to produce heartburnings and disappointments, and while the professional and amateur meet on equal terms, or rather the distinction is altogether ignored, there is absolutely no flavour of the "shop" in all the proceedings.

Monday, October 31, is the last day for receiving exhibits (which must be accompanied by entry forms, if not previously sent) for the Exhibition of the Leytonstone Camera Club at the Masonic Hall, Leytonstone, November 10, 11, and 12. Lady Brooke will open the Exhibition at six o'clock on Thursday, the 10th inst.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 18,647.—"An Improved Photographic Camera." Communicated by J. Felter. H. H. Lake.—*Dated October* 18, 1892.

No. 18,733.—"Improvements in or relating to the Mechanism used in Grinding Machines for Producing Parabolic Conoidal Surfaces." Communicated by Messrs. Schuckert & Co. J. S. Fairfax.—*Dated October* 19, 1892.

No. 18,734.—"Improvements in Machines for Grinding Surfaces to a Parabolic Form." Communicated by Messrs. Schuckert & Co. J. S. Fairfax.—*Dated October* 19, 1892.

No. 18,769.—"Apparatus for Use in Developing, Fixing, Washing, and Printing from Flexible Photographic Films." W. G. Tweedy.—*Dated October* 20, 1892.

No. 18,838.—"Improvements in Optical Lanterns." W. Rice.—*Dated October* 20, 1892.

No. 18,899.—"Improvements in and relating to Photographic Cameras." R. Krügener.—*Dated October* 21, 1892.

No. 18,919.—"Improvements in Lenses for Telescopes, Photographic Cameras, and Magic Lanterns." Complete specification. M. J. Gunn.—*Dated October* 21, 1892.

No. 18,938.—"An Improved Sliding Curtain for Optical Lanterns." H. L. Toms.—*Dated October* 22, 1892.

SPECIFICATIONS PUBLISHED.

1891.

No. 17,744.—"Reproducing Drawings." Stubbs.

No. 20,346.—"Artistic Printing Surfaces." Herkomer & Cox.

1892.

No. 5922.—"Printing Surfaces." Claremont.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
October 31	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 31	Richmond	Greyhound Hotel, Richmond.
,, 31	Rossendale	Townsend-chambers, Rawtenstall.
November 1	Exeter	College Hall, South-street, Exeter.
,, 1	Glossop Dale	Rooms, Howard-chambers, Glossop.
,, 1	Herefordshire	Mansion House, Hereford.
,, 1	Keighley and District	Mechanics' Institute, North-street.
,, 1	Lewes	Fitzroy Library, High-st., Lewes.
,, 1	North London (Annual)	Wellington Hall, Islington, N.
,, 1	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 1	Rotherham	
,, 1	Sheffield Photo. Society	Masonic Hall, Surrey-street.
,, 1	York	Victoria Hall, York.
,, 2	Edinburgh Photo. Society	Professional Hall, 20, George-street.
,, 2	Photographic Club (Annual)	Anderton's Hotel, Fleet-street, E.C.
,, 2	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 2	Southsea	
,, 2	Wallasey	Egremont Institute, Egremont.
,, 2	West Surrey	St. Mark's Schools, Battersea-rise.
,, 3	Bolton Photo. Society	Baths, Bridgman-street.
,, 3	Brixton and Clapham	Gresham Hall, Brixton.
,, 3	Camera Club	Charing-cross-road, W.C.
,, 3	Dundee and East of Scotland	Lamb's Hotel, Dundee.
,, 3	Glasgow Photo. Association	Philoso. Soc. Rooms, 207, Bath-st.
,, 3	Leeds Photo. Society	Mechanics' Institute, Leeds.
,, 3	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 3	Oldham	The Lyceum, Union-st., Oldham.
,, 3	Tunbridge Wells	Mechanics' Inst., Tunbridge Wells.
,, 4	Brighton and Sussex	
,, 4	Bristol and West of England	Rooms, 28, Berkeley-sq, Bristol.
,, 4	Cardiff	
,, 4	Croydon Microscopical	Public Hall, George-street, Croydon
,, 4	Holborn	
,, 4	Leamington	Trinity Church Room, Morton-st.
,, 4	Maidstone	"The Palace," Maidstone.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

October 25,—Mr. Thomas R. Dallmeyer in the chair.

M. Boissonas' Tele-photographic Picture of Mont Blanc.

The Chairman referred to a tele-photograph of Mont Blanc by M. Boissonas, which he had brought with him, and which he asked members to compare with that in the Photographic Society's Exhibition, and they would find in the second picture (which was taken at a distance of forty-four miles) much finer definition. The weather was windy when the Exhibition picture was taken. In all tele-photography it was preferable to have calm weather, and in this respect the second photograph was taken under much more favourable circumstances than the first and was much more clearly defined. When using the tele-photographic lens any slight tremor made the nodal point move a good deal more than it would under ordinary circumstances, when using a lens in which the nodal point was within the lens system itself.

The Hon. Secretary exhibited and explained Messrs. Watson's new Alpha hand camera for use with double backs. The front let down, being supported

by a strut pressed into a notch—it was then drawn out and clamped. The parts were interchangeable.

Architectural Photography.

In opening this subject, Mr. F. P. Cembrano, jun., said it might be subdivided into three parts—Apparatus, process, and subject. Dealing with the first, he thought the tripod should be one with sliding legs, and rigid. He did not think it was a good policy to take the picture from a very high point of view. Photographs taken from a height of ten or twelve feet did not give one a representation of the subject as one was used to see it. The best point of view was the same height as one's eyes. The tripod was liable to slip about, and various devices had been suggested—such as corks—to prevent that. He thought Mr. A. L. Henderson's idea of struts fixed to the tripod a great convenience for this purpose. The best camera for use was one with a square bellows; the ordinary conical bellows was difficult to manage when used with short-focus lenses. Another point with regard to the camera was to have the back perfectly square, so that one could be able to draw the shutter from either the right, the top, the left, or the bottom. As to the swing front, he did not know how far it was essential or useful, but he himself seldom found any use for it. He preferred to tilt the camera and swing the back. For dark interiors, it was useful to oil the screen of the camera, which helped one a good deal in focussing. Some of his Spanish interiors were so dark that he could not focus even in that way, so that he had to ask somebody to hold up a light for him. As to lenses, he had used both Dallmeyer's and Ross' symmetricals with satisfactory results, and no doubt the newer lenses such as Zeiss, the Concentric, &c., would do just as well. A level to place on the top of the camera so that one could see the spirit horizontally, was essential in photographing interiors, especially when the buildings were not upright. Backed plates were admirable for interiors, although for ordinary work a plate that was rapid and that had plenty of emulsion on it would help one a good deal against halation.

A number of slides, illustrating points in Mr. Cembrano's address, were then projected on the screen. In reference to the first of these—a church interior at Bath—he said that having given about half the exposure required—twenty-eight minutes with *f*-45—he was told that the church would be required for a service; he then altered the diaphragm to *f*-16, and gave another fifteen minutes. Contrary to what might have been expected, there was no doubling of the image. Continuing, he said architectural photography might be divided into several branches—for instance, photography for architects in the rendering of small details, of which they saw plenty of illustrations and sets. He would point out that, where possible, objects near the camera should be avoided, especially with regard to interiors of private houses. Very often such pictures would be improved by moving a chair or a table which was quite close. Conspicuous things, indeed, should be avoided when using short-focus lenses.

Development of Interiors.

One often got strong contrasts, especially when photographing in the south, where buildings painted white were so abundant. Besides the importance of giving full exposure, one had to be very careful in the development. He found himself, when photographing in the south of Spain, that the only way to obtain a good result in the deepest shadows, as well as to get printing density in the highest lights, was to develop with a brush, starting with a weak developer to get the image out, and, when once it showed, washing the plate thoroughly, strengthening the developer, and with the brush developing up such parts as the dark parts of a ceiling, and, generally, the detail in the shadows. In the case of a negative where all the light the subject received came from the front, development in the ordinary way would be useless; in the way he had mentioned, no detail in the high lights would be lost. For such a picture, with an exterior view, one second, with *f*-32, would suffice for the exterior only; the interior, with the exterior showing, had half an hour. Where the light came in through two doors, he had seen an architect cover up one of them with black velvet, expose for the interior, take down the velvet, and then expose for a few seconds for the exterior view. In taking interiors, Mr. Cembrano continued, it gave pictorial effect to the picture, and gave better perspective, or better ideas of depth, if one managed to take the picture facing the light—having a window or door at the end of the picture. Of this effect he showed several examples from his Spanish Alhambra series. In exteriors, where possible, one should endeavour to wait for the sun to break up the shadows. Figures, again, often helped in architectural photography; so that what would otherwise be nothing but an uninteresting photograph, except to architects or archæologists, might be made quite pictorial. This point he also illustrated, and, going on to remark that architectural studies might also be improved by the addition of clouds, showed a slide of Salisbury Cathedral in proof thereof. In conclusion, he indicated the suitability of the optical lantern for showing architectural photographs, a large screen showing off the slides to better advantage than a small one. Thus, an amateur could always use a quarter-plate camera, and get the best results, trusting to the optical lantern for showing them on a large scale.

Mr. Chapman Jones showed examples of distortion by tilting the plate, and the partial cure by copying, the negative or the plate being then inclined. He had photographed a series of squares on a sloping plate, and pointed out that one not only got converging perpendiculars, but a larger and smaller scale of graduation. The convergence of perpendiculars might be cured by sloping the plate in the camera, but one effect of the distortion would still be left, due to the alteration in the scale of the squares, the image being lengthened in the direction of the tilt. If the distorted negative alone were tilted, and the plate in the camera kept vertical, the opposite effect would result, the image being shortened vertically. Mr. Jones observed that it had never been stated exactly how one could get over the difficulty.

Mr. T. Sebastian Davis said, with regard to Mr. Cembrano's method of development, there was a point of universal applicability. In taking ordinary landscape subjects—or rather the majority, to which his observations referred—they obtained a considerable portion of the parts which could not be brought out to the best advantage by uniform development, the lighter portions of the picture becoming too intense before they could bring out all the details in the shadows, more especially foliage and other dark parts of the picture. He himself had suggested Mr. Cembrano's method of development, in the first instance, for bringing out, as far as possible, the whole of the details of the picture before intensifying the other portions. They obtained a far wider range by washing away the developer, and then redeveloping those portions which are the darkests parts by the application of the developer with a soft brush to those particular portions.

Mr. Cembrano said he applied the method to landscape photography, especially where he wanted to secure the sky—developing the sky first, before anything else on the plate, and bringing out the rest with normal development. As to gauging what was going on during development (a point referred to by Mr. Davis), a thickly coated plate took a long time before the image got through, and was obliterated in brush development. He had never developed a plate altogether black. For architectural subjects and interiors, he advised a developer giving blue images as far preferable to one with which hardness might be got. He used pyro-ammonia, with plenty of sulphite. In some cases he washed as many as ten or twelve times, his object being to avoid markings. He would like to ask the Chairman whether there was any means of obviating the distortion which was inevitable in taking most architectural subjects—a high building, or an interior, where one had to tilt the camera and swing the back, and in doing so shortened the image and started distortion.

The Chairman, in reference to Mr. Cembrano's suggestion that the camera should not be raised above the level of the eye, would have thought that in architectural work it would not have mattered how high the camera was placed. It was certainly impossible to obviate exaggerated perspective which comes in tilting the camera, and having near foregrounds and distance. It depended upon true monocular perspective, which was an absolute science, certain laws being obeyed which could not be got away from. As regards architectural lantern slides, he thought such slides on a big screen were much more satisfactory than pictures of the same subject from a near point of view. By the employment of long-focus lenses such as are used in tele-photography, they were able to maintain the sensuous impression of the perspective, whereas the same picture if taken from a near point of view, would produce strained appearances. Most lantern slides seemed to lose a good deal of this forced appearance in projection.

After a vote of thanks to Mr. Cembrano the meeting adjourned.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

October 20,—Mr. C. H. Cooke in the chair.

Mr. C. G. Norton passed round several old and recent prints from the wet-plate negatives he showed at a previous meeting, and among them a print made in 1851 from a paper negative.

Amidol.

In the course of a short discussion on this subject, Mr. J. A. Sinclair observed that amidol might be used with rodinal without disastrous effects.

Mr. P. Everitt found that carbonate of soda accelerated the action of amidol.

Mr. E. W. Parfitt observed that he got more detail in a negative by developing with pyro-soda, rinsing it off, and then continuing development with amidol.

The "Frena" Hand Camera.

Mr. Bynoe exhibited and explained the principles of Messrs. Beck's "Frena" hand camera, exhibiting enlargements from negatives made therewith. He also showed the "Bynoe" printing frame, which he incidentally observed had been introduced for printing the "Frena" film negatives.

Mr. J. Weir Brown thought it a disadvantage that the lens of the "Frena" only worked at *f*-11, and suggested that other stops should be provided.

The decision of a lantern-slide competition and a miscellaneous display of slides concluded the meeting.

North London Photographic Society.—October 18, 1892, Mr. J. Traill Taylor in the chair.—Copies of Messrs. Catlett & Neall's new monthly paper, *Dry Plates*, were distributed. Mr. Mackie showed an advance copy of the Ilford *Year Book*, which was much appreciated. Nominations were received for election of Council at the Annual Meeting to be held on November 1. The Chairman then brought before the members a series of notes on the reproduction of photographs by means of printing ink, in which he dealt with the various photo-mechanical processes from the time of Nicephore St. Niepce to the present, the processes being not only described, but illustrated by specimens. A cordial vote of thanks to Mr. Taylor concluded the meeting.

North Middlesex Photographic Society.—October 24.—The first Members' Lantern Evening of the season was held. The President (Mr. J. W. Marchant) was in the chair, and about 120 members and friends were present. Messrs. Ainsley, Beadle, Chang, Fox, Gregory, Jones, Marchant, Mummery, Plunkett, Smith, Taylor, Littenoor, Wall, and Wynne contributed slides, and Mr. R. F. Wynne manipulated the lantern. The slides were of the usual varied character, some of the sets being of great beauty, and, as a whole, showed a marked improvement over last year's work. In nearly all instances much attention had been given to securing atmospheric effects, and in the majority with considerable success. The glittering black and white slides, with points of light spotted all over them, of early days, were conspicuous by their absence. The next meeting will be held on November 14, when Mr. J. Traill Taylor will address the Society on *Photographic Optics*. Visitors will be welcome.

Holborn Camera Club.—October 21, Mr. J. Havery in the chair.—Mr. E. Benest gave a lecture and demonstration on *Simple Chemical Analysis for Photographers* (see page 694). He experimented with various chemicals he had brought with him, and gave to the members present quite an instructive and unique demonstration. On Saturday last the Club entertained the members of the Holborn Cycling Club by giving a lantern show of slides made from negatives taken at the Southern Cyclists' camp, held at Dorking in August this year.

Lantern Society.—October 24.—Mr. Taylor exhibited an improved form of Lawson's saturator, which gave a very brilliant light. Mr. Askew exhibited his portable lantern and stand, of ingenious construction, and capable of being carried on a bicycle. It is made by Messrs. Newton. The Hon. Secretary then showed a lantern of a novel description, which he had designed for his own use. In its construction aluminium was used wherever practicable. Instead of the metal-lined mahogany body, there was a cloth curtain lined with asbestos; the condenser mounted in aluminium was held between two thin plates of the same metal; and the slide carrier was held rigidly in position by means of an aluminium plate and two screws. The lens was mounted in a plain aluminium tube, and was carried by a small saddle, moving along the front board by means of a rack and pinion, and connected to the lantern body by a small camera bellows. For packing away the whole thing folded up, and together with all the necessary fittings and two regulators stowed away in a box $18 \times 12 \times 5\frac{1}{2}$ in. The total weight, including the box and regulators, was about twenty-one pounds, the corresponding weight of the lantern which it has superseded being thirty-eight pounds. The space for the jet was practically the same as in an ordinary lantern, so that any jet, or an oil lamp, could be used with it

Hackney Photographic Society.—October 18, Mr. W. P. Dando in the chair.—Messrs. Cross, Green, and Dr. Vere-Nichol were nominated for membership. Work was shown by Messrs. Gosling, Puttick, and Beckett (portraits of the Exhibition Committee), S. J. Beckett, Funstough. Mr. S. H. Barton then gave a short paper with illustrations on *Portraiture without a Studio*. He had been fairly successful outdoors in taking portraits, and his method was to take them between two walls. He said it was advisable to not have too much top light. Portraits should be soft, and a formula he recommended to obtain softness was an eikonogen one, given by Mr. Chapman-Jones. The Society's blackboard was then requisitioned, and the Hon. Secretary proceeded to draw a design he had made for taking portraits in the open. It consisted of four uprights, after the fashion of an ordinary clothes-horse, and the lighting was subdued as required at top and sides by various kinds of calicoes, &c. Mr. Gosling had used a roll of Lancaster window-blind as a background and shield from the top light. The Chairman had found the ordinary brown paper used for putting under carpets of service. The Hon. Secretary said he had obtained good results with this. Mr. Beckett, in answer to various questions put to him, said he would have a fair amount of top light and a high shield at the back and side. As far as retouching was concerned, he advised it in a general way, but the likeness ought never to be sacrificed to the retouching. Mr. Gosling asked how to reduce a small dense part of a negative. The Chairman said he would use methylated spirit one part, and water two parts, gently rubbing in solution with cotton-wool. Mr. Beckett said he would use a knife, but with great care. The Hon. Secretary announced that the next meeting (Tuesday) would be a Flashlight Evening.

People's Palace Photographic Club.—October 19, Annual General Meeting.—The following are the officers for the ensuing year:—*President:* The Chairman of the Drapers' Company Institute.—*Vice-Presidents:* Messrs. C. W. Gamble, J. Osborn, and G. Hatton.—*Committee:* Messrs. R. Beckett, W. Barrett, G. Bolton, G. Clarke, G. Kendall, T. Lawday, G. Patten, and W. K. Walker.—*Hon. Secretary* and *Treasurer:* Mr. S. J. Beckett, The Grove, Hackney, N.E. Photographers (amateur and professional) desirous of becoming members are asked to write the Hon. Secretary for particulars.

Leytonstone Camera Club.—October 22, Dr. W. P. Turner (President) in the chair.—Mr. A. P. Wire gave a lecturette on *Stereoscopic Photography with a Single Camera*. Mr. Wire explained, very lucidly, the principles involved in the construction of the stereoscope, its lenses and pictures. A stereoscope was exhibited that was made by the lecturer, and made in such a way that the lenses could be taken out for examination. In explaining on what principles the pictures were made, Mr. Wire showed some line drawings made by hand, in which the stereoscopic principle was adopted, and which in the stereoscops showed the well-known solidity. Next were shown some photographs of still life—shells and vases of flowers—which had been made by the lecturer. The camera was fixed, and the object to be taken placed on a small turntable. Taking one view, and then moving the object and table slightly round, a second view was taken. In this way, by using ordinary quarter-plates, the two necessary views were taken, and capital stereo-photographs made. Mr. Wire having shown that his plan was only adapted to still life, Dr. Turner "took up the parable," showing a handsome little stereo-camera for outdoor work, with single lens and case-board so arranged that the two pictures can be taken on a stereoscopic plate by moving the camera along the case. A discussion followed, in which Messrs. Watson Brown, M.A., F. Wates, W. G. Roberts, and others took part.

Putney Photographic Society.—October 17, Rev. L. Macdona in the chair, the subject being, *How to Make a Lantern Slide*, by Mr. S. Herbert Fry.—Mr. Fry commenced by pointing out what qualities were necessary in good lantern plates, and in what particulars their treatment and the result desired differed from negative plates. The essential requirements of a good slide were that in some part of it there should be absolutely clear glass, and that the darkest shadows should be transparent. In order to secure these results a fairly correct exposure was necessary, and forcing of development should on no account be attempted; he therefore recommended a standard developer which, by experience, had been found to work well with the particular brand of plates in use, and that no modification of this should be tried in order to compensate for over or under-exposure. The use of such a standard developer naturally required a more correct exposure, relatively, than that necessary for a negative plate, where a modification of the developer was permissible; but, as the exposure of the lantern plate was under more perfect control, there would in practice be found little difficulty in giving the right time. The slides could be made in two ways, viz., by contact, or in the camera. Contact printing was, on the whole, best done by artificial light, and in the camera by daylight. Mr. Fry showed a printing frame in which a slide could be made by contact from any suitable part of a larger negative; he claimed no special advantage for the particular form of frame, but it was obvious that a contrivance of the kind was a convenience, not to say necessity, in successful working, as it was of importance that the edges of the lantern plate, *i.e.*, the thickness of the glass, should be protected against stray light; the omission of such protection was a frequent source of fog near the edges. With regard to the illuminant used during exposure, it was no doubt possible as a *tour de force* to use a wax vesta, but Mr. Fry said he would assume that the members generally worked with a paraffin lamp or gas-burner, and these would perhaps be found the most convenient in ordinary work. Weak negatives were best printed from by a weak light, or at a considerable distance from a powerful one, whereas plucky or dense negatives would give the best results when printed close to a good light. The time of exposure would, of course, vary with the character of the negative, but the correct exposure could be readily determined in the following manner:—Divide the plate approximately into, say, five strips, then shield four-fifths, and expose the one-fifth 10 seconds, the shield being then moved so as to screen only three-fifths, and kept in this position another 10 seconds, and so on until the whole of the plate has been exposed; one-fifth will then have been exposed 10, the next 20, 30, 40, and 50 seconds respectively. On developing this trial plate in the standard developer, it would at once be apparent which part of it had received the correct exposure. When the correct exposure has been once ascertained, it should be noted on the negative, together with the nature of the light and the distance from it, for future reference; the negative envelopes now commonly in use lend themselves conveniently for notes of this kind as well as for storage. The exposure being correct, the development in the standard developer would present no difficulties, it being only necessary to watch progress, and to take the plate out when of sufficient density. On the subject of exposure in the camera, Mr. Fry said this could be done either in daylight or by artificial light. When daylight was used, the negative could conveniently be placed against the window, and the camera pointed at it, and focussed to the desired size, care being taken that no buildings, chimneys, trees, &c., should appear behind the negative, as they would, of course, be reproduced on the lantern plate. It would not be necessary to exclude daylight from the room, but direct rays of light must be prevented from entering the lens, and this could be efficiently done by placing a piece of brown paper, with a hole cut in the centre for the negative, against the window, the paper being of such a size as to cover the cone of light entering the lens; no further covering between the negative and lens is necessary. Daylight being very variable, no rule as to the length of exposure could be laid down; generally a small stop should, by preference, be used in a fair light, so that the exposure might be well under control. As regards artificial light, the chief difficulty was to obtain even illumination of the negative. Mr. Fry said he had used, with satisfactory results, the following arrangement:—The negative is placed at the end of a suitable box or frame opposite the lens, which may be mounted in the usual way on an ordinary camera, and the lantern plate exposed in a double slide, exactly as when taking a negative; special apparatus for making lantern slides by reduction is frequently used, but, as will be seen, is no necessity. The illumination of the negative is obtained as follows:—A piece of white opal, white paper, or a whitewashed board, is placed at some little distance behind the negative and parallel with it. On *each* side, between the negative and reflector, is placed a lamp, or gaslight, or other convenient illuminant; the two lights should be placed near the negative, and as close together as possible, but without allowing any part of their images to enter the field of the lens. It has been found that by this system of using reflected light about forty per cent. of the total is utilised, and that the illumination is very even. In order to obtain the best results as large a stop as possible, consistent with the covering power of the lens, should be used. As an example, it may be stated that with a good light and an average negative, working the lens at *f*-16, an exposure of four minutes will be about right. One of the advantages of the reduction method in the camera is that, by the careful use of the swing back, divergent and convergent lines in the negative may be rectified on the slide. On the subject of printing in clouds, Mr. Fry said that the easiest method was to print them on a separate plate, and use this as a cover plate, due note being taken that when so placed the direction of the light would be reversed, and that, therefore, it was necessary to print from a cloud negative with the light coming from the right in order to suit a view which is lighted from the left, and *vice versâ*. The cloud print should be given a comparatively short exposure, and should not be developed far, otherwise there was danger of loss of transparency. During the lecture Mr. Fry illustrated his points by practical demonstration, exposing, developing, and fixing prints of views and clouds.

South London Photographic Society.—October 17, the President (Mr. F. W. Edwards) in the chair.—Mr. Arthur C. Baldwin opened *A Chat on the Eastman Products*, and dealt with the various methods for producing the stripping films formerly sold by the Eastman Company, which ultimately led to the manufacture of the rollable film, as now manufactured. The method of using the roll-holders was now explained, and specimens shown. The "Sol'o" paper was then dealt with, and explanation was given as to the means to be adopted for producing a variety of tones. The formula for the borax bath (blue tones), and the combined toning and fixing bath (warm tones) were given with the paper when purchased. For rich velvety black tones the following was recommended:—Phosphate of soda, 100 grains; chloride of gold, 5 grains; water, 40 ounces. The addition of a pinch of aluminium chloride to the ordinary alum bath materially assisted in the hardening of the gelatine film. Potash alum must always be used, as ammonia alum does not form in this case a good substitute. The combined bath was so simple "that a child can make and use it, is delightfully certain in its action, and is practically permanent." The proceedings terminated with the toning of several prints by the different baths, to show the tones obtainable. Attendance, forty.

West Surrey Photographic Society.—Usual fortnightly meeting at headquarters, the Public Library, Lavender-hill, Clapham Junction. Mr. Winsford in the chair.—The subject of the evening was a demonstration, by Mr. George H. James, of the *Carbon Printing Process*. Mr. James went fully into all the details of both the single and double transfer processes, illustrating his remarks by prints from some of his very fine snap-shot negatives. Mr. James, after having described the safe-edge necessary in carbon printing, and various forms of actinometer to gauge the depth of printing by, went on to describe the development of the image. He said that one of the peculiarities of this

process is that the development takes place from the back, this being due to the fact that the parts of the sensitive, bichromated gelatine acted upon by the light, are rendered insoluble in water, and, as the light never did penetrate right through to the surface of the paper, there was always between the insoluble gelatine and the paper a layer of soluble gelatine, which was dissolved out in developing; hence the necessity of fixing the print upon the temporary or permanent support before development. A large number of prints, made by the Woodbury Company, were passed round for inspection.

Brixton and Clapham Camera Club.—October 18, Mr. James W. Coade (Vice-President) in the chair.—The CHAIRMAN first referred to the Club Exhibition to be held on the 17th, 18th, and 19th of next month, and begged members to put their shoulders to the wheel, and to make the Exhibition a great success; he reminded them that the last day for receiving exhibits was the 8th proximo. Subsequently Mr. F. W. KENT gave a few interesting remarks on *Bromide Paper and Lantern Slides*, and, by making several prints, showed the different results which could be obtained by varying the exposure, distance from the light, and the developer. The paper used was Ilford Slow, and the developer ferrous oxalate. Mr. Kent also made some lantern slides from half-plate negatives in a reducing camera of his own construction.

North Surrey Photographic Society.—October 18.—Mr. FITZPAYNE read a paper and gave a demonstration of *The Method of Development of the New Cold-bath Platinotype Paper*. He commenced by stating that the paper was more convenient to manipulate than the hot-bath paper; that the results achieved were superior; that the film was not susceptible to abrasion; and that the liability to scald the fingers was, of course, entirely absent; and then proceeded to practically prove his assertions by developing several prints, during which operation the remarkable control which could be exercised over the action of the developer was very apparent. He explained the necessity for printing the paper until the whole of the details were out, in fact, that printing should be carried as far as possible without solarisation, but stated that, should this stage be reached, it was possible to print out with the paper, and then, of course, no development was necessary, the print only requiring to be fixed in the hydrochloric-acid bath. He drew attention to the necessity of using a much weaker developer than was required for the hot-bath paper, and recommended the use of the Platinotype Company's "D" salts in the proportion of a quarter of a pound to forty-eight ounces of water, and showed how, when mixed with an equal quantity of glycerine, the operation of development was most simply performed with a brush, the print being stretched on a glass slab or on the bottom of a dish. After developing a print, with the most excellent results, Mr. Fitzpayne explained the process of toning or, to describe it more accurately, of painting the platinum image with uranium, for the formula of which he referred the members to his memorandum on the subject in the *Camera Club Journal* for October. Numerous prints that had received this treatment were handed round for inspection, some showing the different shades that could be obtained—from light brown to a very deep red, and some the bad effect of not entirely eliminating the iron from the print before toning. In reply to a member, Mr. Fitzpayne explained why "painting" was an apter description of his process than "toning," as the whole resulting colour could be easily removed by immersing the print in a weak solution of ammonia.

Blackheath Camera Club.—October 4, first Annual General Meeting, Dr. Ernest Clarke, M.D., B.Sc., in the chair.—The officers for the Session of 1892-93 were elected as follows:—*President:* Mr. W. H. M. Christie, M.A., F.R.S., F.R.A.S. (Astronomer Royal).—*Vice-Presidents:* Dr. Ernest Clarke, M.D., B.Sc., and Mr. J. T. Field, L.Mus., I.C.L.—*Council:* Revs. W. P. McDonald, M.A., and W. K. Soames, M.A., F.R.A.S.; Messrs. Edmund Dashwood, M.R.C.S.; W. Claude Johnson, M.I.C.E., F.R.A.S.; Samuel E. Phillips; George Vesper, and E. J. C. Wiseman.—*Hon. Curator:* Mr. W. Farrington.—*Hon. Treasurer:* Mr. A. W. Young.—*Hon. Secretaries:* Messrs. T. R. Earle, The Cottage, Handen-road, Lee, S.E., and C. W. Piper, 46, Shooters' Hill-road, Blackheath, S.E. The report for the last Session, which was unanimously adopted, shows a good record of work done in the way of lectures, demonstrations, and summer excursions, while the balance-sheet shows that the Club is in a very satisfactory financial position, considering that it is only just entering the second year of its existence. The Council hope to be able in a short time to provide a dark room for the use of members, to many of whom it will doubtless be of great service. The first ordinary meeting of the present Session was held at the Art Club, Blackheath, on October 10, the Rev. J. H. S. Taylor, B.A., being in the chair. Dr. Ernest Clarke (Vice-President) gave a lecture on *The Eye as a Camera*, illustrated by lantern slides specially prepared for the occasion, and also by models. The lecturer described in detail the complicated structure of the human eye, pointing out the manner in which the various parts are reproduced in the camera. He explained that the lens of the eye can be separated into three distinct lenses—two divergent menisci with a double convex between—thus bearing a striking analogy to a photographic lens. The iris corresponds to the diaphragm or stops, but automatically adjusts itself, the aperture becoming smaller as the light increases, and larger as the light diminishes; it is in front of the lens, and both are protected by the cornea, which is simply a transparent cover to prevent dust, &c., from interfering with the delicate mechanism of the iris and lens. The retina corresponds to the sensitive plate, and consists of the interior coating of the back of the eye, which, under the microscope, is seen to be of a very complicated structure. From this sensitive surface the sensations of light and colour are carried by the optic nerve to the brain. The retina differs from the sensitive plate in having a curved surface, which at all parts is equidistant from the lens, whereas the photographic plate has, of necessity, a plane surface, the centre being nearer the lens than any other portion, and the edges being at a greater distance; this is the cause of what is known as curvature of the field—a defect which, of course, does not exist in the eye. The most remarkable difference between the eye and the camera is in the manner of focussing; this in the camera is accomplished by moving the lens either further from or nearer to the plate, but in the eye the lens itself is altered by a series of muscles, arranged so as to act upon it from all sides, which make it more or less convex, as required. In the normal eye, focussing is only necessary for objects within a distance of about twenty feet, for anything beyond that distance the eye is practically a fixed-focus camera. The whole interior of the eye is filled with a semifluid, transparent matter, and the retina is impregnated with a black pigment to prevent the reflection of light within the eye; the interior of a camera is, of course, blacked for the same reason.

Bournemouth Society of Natural Science (Photographic Section).—October 19, Inaugural Meeting of the winter session of this Section. The President (Rev. J. R. Husband, M.A.) took the chair.—A short address was delivered by the PRESIDENT, who referred to the work accomplished during the summer, also urging the members to renewed exertions in the direction of artistic photography as well as to excel in the working of the various processes. The President also gave some notes on the *New Cold Bath Platinotype Printing Paper*, during the reading of which the chair was occupied by Dr. H. Nankivell, one of the Vice-Presidents. Two prints were developed and fixed by the new process, and the simplicity with which the paper was worked recommended itself to all present. An album of interesting views on this paper was shown, and the President also announced his intention to give a prize to be competed for by the members of the Society who were beginners. Some notes on Ilford Printing-out Paper were also given by Mr. P. H. PRICE. The various results to be obtained by different toning baths, also the difficulties that could be overcome in numerous ways during the operation of printing and toning, &c., were well illustrated by some nicely finished views which were handed round for inspection.

Brechin Photographic Association.—October 19, Mr. H. Braid (Vice-President) in the chair.—The SECRETARY, as delegate to the Photographic Convention, gave a short report of the proceedings and exhibits, and exhibited the "Developan" and Beck's new metal printing frame. The developan having only come to hand that morning, it had not been possible to get a plate developed to show how it would work. Mr. J. D. Ross thereafter read a short paper on *Enlarging*, finishing up with a demonstration on Eastman's bromide paper. The subjects were a statue of Hamlet and a view of Brechin Cathedral. Both turned out very successful, and, on the motion of the CHAIRMAN, Mr. Ross was thanked for his paper and demonstration. Messrs. Gregor Cumming and Alexander McLeod were admitted members. The lecture and exhibition of slides illustrating linen manufacture was fixed for December 14.

Manchester Photographic Society.—October 13, Annual Business Meeting, marking the thirty-seventh year of the Society's existence.—Mr. George Hartley and Mr. O. H. Webb were elected members. The report of the retiring Council was read and adopted, and the Treasurer's balance-sheet presented. These recorded a successful year, and showed the position of the Society to be satisfactory. During the counting of the votes for new Council, a large number of members' slides were shown on the screen. The result of the election of officers was announced as follows:—*President:* Mr. Abel Heywood, jun.—*Vice-Presidents:* Messrs. Alfred Brothers, F.R.A.S., T. Chilton, T. R. Cobley, H. M. Whitefield, and J. Wood.—*Council:* Messrs. A. H. Beckett, W. Blakeley, F. W. Burt, C. H. Coote, F. Edwards, J. T. Hughes, G. J. Johnson, H. V. Lawes, W. Tomlinson, and E. G. Wrigley.—*Hon. Treasurer:* Mr. W. G. Coote.—*Hon. Librarians:* Messrs. C. H. Coote and H. V. Lawes.—*Hon. Curator:* Mr. E. G. Wrigley.—*Hon. Secretary:* Mr. W. H. Farrow. Abstract of report: The Council have to record that the interest in the Society has been steadily maintained amongst the members, the attendance at the ordinary meetings having been equal to the average of the past few years, although there are a number whose more frequent presence would be greatly appreciated. There had been no dearth of matter at the meetings, rather, on the other hand, have the subjects broached been both numerous and varied, and productive of both instructive and interesting discussions. The lantern meetings have been all of a popular character, and were well attended by members and friends. The outdoor meetings have not been very successful as a whole, although several pleasant rambles took place. A sub-committee appointed to consider the advisability of formulating recommendations as to the supply of compressed gas under Government regulations, had decided that very little action could be taken until after the Parliamentary elections. The Council recommended that an exhibition should be held next March. The Council tendered their thanks to the many firms and publishers who had contributed apparatus and matter during the past year. In retiring, the Council expressed the hope that the members would accord the same hearty support to their successors that had been given them, and which was ample thanks for the time they had devoted to the interests of the Society.

Sunderland Photographic Association.—The annual meeting of the above Association was held on the 19th inst., Mr. J. Lynn in the chair.—The report which was presented shows the Society to be in a flourishing condition, there being sixty-four members on the roll. The officers for the coming year were elected as follows:—*President:* Mr. W. Milburn.—*Vice-Presidents:* Messrs. J. Lynn and W. Pratt.—*Council:* Messrs. W. Bartram, J. W. Broderick, A. G. Boulton, E. R. Kirkley, Dr. Legat, W. J. Pope, A. Peddie, R. Stafford. *Hon. Treasurer:* T. Walton.—*Hon. Secretary:* C. E. Cowper, Thornhill-gardens, Sunderland.

ALDENHAM INSTITUTE CAMERA CLUB.—The following is a provisional programme for the coming winter:—*Developing* (Demonstration). *Retouching* (Demonstration). *The Human Eye as a Camera Obscura* (Continuation of Lecture by Mr. A. Hair). *Platinotype Printing* (Demonstration). *Gelatino-Chloride Paper* (Demonstration). *With the Convention at Edinburgh* (Lantern Evening). Lecture on *Optics*. *A Jaunt through Belgium* (Lantern evening). Other demonstrations, competitions, and excursions will be arranged, due notice of which will be posted on the notice-board.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

A BLACK SHEEP.

To the EDITOR.

SIR,—Under the heading, "A Black Sheep," you mention in your issue of last week the exposure of a professional photographer who seems to have certainly very much misbehaved himself, and deserves probably more punishment than he is likely to get.

My reason for referring to the paragraph is to emphasise your action in stating clearly the religion of the culprit. It must be of considerable interest to the public to ascertain this, and I think you might further add to your information a detailed list of the religions professed by Neill Cream, Deeming, the late lamented W. Palmer, and other offenders. You will then show clearly, what you were no doubt eager to do by your previous publication, what an extraordinary thing it is for a Jew to indulge in moral and legal turpitude!—I am, yours, &c.

HENRY E. DAVIS.

Camera Club, Charing Cross-road, W.C., October 24, 1892.

[Good friend, in stating that Sauvy was a Polish Jew, our intention was simply that of most persons who use that, or any similar phrase, namely, to indicate his nationality, not his religion. As a matter of fact, we gathered the information from *Spy*. The circumstance that some of the most esteemed friends of ourselves and of this JOURNAL are, as Mr. Davis himself is perfectly well aware, of the Jewish religion, should surely show that we are guiltless of any intentional impropriety in the matter.—ED.]

EXPANSION OF AMMONIA ON DILUTION.

To the EDITOR.

SIR,—In reply to Mr. Cadett's letter in THE BRITISH JOURNAL OF PHOTOGRAPHY of the 14th inst., allow me to draw his attention to what is said in Watts' *Dictionary of Chemistry* on the authority of the late Dr. Ure: "One volume of water by absorbing 505 volumes of ammonia forms a solution occupying 1·5 volumes, and having a specific gravity of 0·9. This, when mixed with an equal bulk of water, yields a liquid of specific gravity 0·9455, whence it appears that aqueous ammonia expands on dilution." Such a mixture ought, according to Griffin, to occupy a volume 2; but, if we calculate from the above data, we find that it occupies 2·0084 volumes, giving an increase of volume corresponding to 0·42 per cent. The number I obtained from the rough experiment I made lately gave an increase of 0·37 per cent., showing that I was not very far from the truth.

If Mr. Griffin's tables were calculated on the assumption that there is no increase in volume when ammonia is diluted with water, they must be wrong.

The whole matter can be easily settled by obtaining the reply to the following question: Does ammonia on dilution expand, or is the volume of the diluted ammonia the sum of the volumes of the constituents? I have given my answer above, and I hope Mr. Cadett will repeat that simple experiment I referred to at the London and Provincial Photographic Association, with all the necessary precautions, and report the result. I am convinced that, when he has done so, his faith in the particular tables will not be as great as it is at present.

The most recent researches on the connexion between specific gravity and percentage of ammonia in different solutions do not agree with the tables given by Griffin.

I never made any allusion to the expansion affecting results practically. All that I wished to draw attention to was the statement that ammonia differed from all other liquids in neither expanding nor contracting on being diluted with water, and that calculations based on that assumption must be erroneous; but this departure from the straight line may not introduce serious errors in practice.—I am, yours, &c., A. HADDON.

R. N. College, Greenwich, S.E., October 22, 1892.

"THE PHOTOGRAPHERS' BENEVOLENT."

To the EDITOR

SIR,—I thank you for the space you gave for my letter of last week, *re* the Benevolent. It may interest you to know that it has caused one case of apparently critical distress, which can be relieved by a temporary loan, to be brought before us. We have given temporary assistance in one or two other cases, and have several cases in our hands of assistants wanting places. One typical case is of an operator and retoucher, who has nearly twenty years' excellent testimonial from one of the best firms of photographers in the country. Over a year ago he emigrated on an engagement, and found, to his deep disappointment, that the firm to whom he had gone was "no good." He picked up a month's work as a temporary hand, was out of work for a week or two, and then, robbed of everything, including his specimens, worked a passage back to England, and has spent nearly a year answering advertisements and looking for work. No specimens, no good. Is now broken in fortune, and almost broken-spirited, but hoping against hope, and unwilling to take money from us, or to lay his case before the Committee at all. In seeking work, he has tramped as much as seventy miles, sheltering at night in coach-houses to husband his last shilling or two, which is rather hard on a man who has mixed with the best of photographic society.

This is one of the cases that ought not to occur if more general interest were taken in the Benevolent, and if photographers wanting assistants would apply to us. Is there any good house near London that will give this gentleman a week's trial even, or a temporary berth? His references are excellent.

We have another case, almost as bad, of a really good man who is working, and has been doing so all the summer, at a mere pittance—one of those places with a small salary and large commission (in theory), but with little or no commission in practice. We have almost all classes of assistants on the books.—I am, yours, &c., H. SNOWDEN WARD,

Memorial Hall, E.C., October 25, 1892. *Hon. Secretary.*

THE IMPERIAL PORTRAIT ASSOCIATION.

To the EDITOR.

SIR,—Every one knows that the final cause of hawks is pigeons; but, thanks to your pages, "The Imperial Portrait Association," with its respectably named and self-accredited President, hailing from Folkestone, and its generous offer of "an exquisite Fusain portrait, free of charge," will not find its prey in yours, &c., WM. C. LEDGER.

Lisnaskea, Iraland, October 24, 1892.

[Our correspondent encloses one of Mr. "Charles Beresford's" usual circulars.—ED.]

TUNBRIDGE WELLS AND EXETER ASSOCIATIONS.

To the EDITOR.

SIR,—Will you please announce that the following gentlemen have kindly consented to act as Judges at our forthcoming Exhibition, viz., Colonel Gale, Mr. George Davison, and Mr. William Mayland?—I am, yours, &c., JOSEPH CHAMBERLAIN, *Hon. Sec.*

Tunbridge Wells Amateur Photographic Association, October 24, 1892.

To the EDITOR.

SIR,—Will you kindly allow me, through the medium of your columns, to inform the numerous applicants for entry forms for our Exhibition, that the latter part of rule 2, prohibiting marks on the face of exhibits, is not intended to exclude the *titles* of pictures.—I am, yours, &c.,

JOHN SPARSHATT, *Hon. Secretary.*

Fairfield House, Alphington-road, Exeter, October 24, 1892.

HARDENING BY CHROME ALUM.

To the EDITOR.

SIR,—Referring to your second leader of August 5, can you give me a rough idea of the strength of chrome alum solution, which will harden gelatine films as, say, a five per cent. solution of potash alum?

The table of solubilities in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC does not give the figures for chrome alum. Can you supply the omission?

Would the solution of chrome alum and meta-bisulphite of potash, which you recommend as a combined clearing and hardening bath, be a stable solution, and what quantities of the two salts should it contain?—I am, yours, &c., S. A. M.

[See leading article elsewhere.—ED.]

AN ELECTRIC RETOUCHER.

To the EDITOR.

SIR,—Referring to your article in last week's JOURNAL, taken from *Anthony's Bulletin*, about "Retouching by Electricity," it presents a significant announcement in what direction the photography of the day is really travelling. Retouching is practised bad enough nowadays by girls and boys, bare of any knowledge of drawing &c., without wanting electricity. *Anthony's Bulletin* says: "A cabinet bust portrait may easily be completely retouched in fifteen minutes, entailing but little fatigue to the operator." Indeed? After this remark we may guess what sort of work here is referred to.—I am, yours, &c., F. B.

October 25, 1892.

MANUFACTURERS AND EXHIBITIONS.

To the EDITOR.

SIR,—The season has now approached when many exhibitions are taking place throughout the country, and manufacturers of specialities are requested to exhibit some of their latest goods. A great deal is usually

promised by the person applying as to the care that will be exercised in showing the articles and returning same; but my experience is a sorry one, for, if the goods have been fairly handled (I say nothing of soiling), the repacking is simply vile—possibly left to some person who never packed a box in their lives. Polished goods sent in tissue-paper will be returned bare, a burnisher tumbling about with mahogany cameras, and anchlike idiotcy. Perhaps others have experienced the same kind of thing, and, like myself, almost vow not to exhibit again. If secretaries of societies and others desire to show the goods of manufacturers, and there is constantly an incentive on both sides to be up to date, the least that can be done in common justice to the exhibitor is to see personally that goods are properly and sensibly packed, so that no loss or quibble arises in a mutual arrangement.—I am, yours, &c.,

57, *High-street, Aston, Birmingham, October* 20, 1892. WM. TYLAR.

Exchange Column.

**** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

An American hunting lever watch, cost 4*l.* 4*s.* lately; will exchange for whole or half-plate set.—Address, H. L. JEFFERIES, King-street, Maidenhead.

Will exchange Lancaster's Omnigraph detective camera for Thornton-Pickard shutter, two and a half inches diameter.—Address M., 2, Cheapside, Bolton.

Wanted, studio accessories in exchange for combined hot and cold roller, cabinet size, cost 10*l.*—Address, S. PATTERSON, Old Chesterfield Arms, Mayfair, W.

Wanted, developing and printing sets for half-plate camera; exchange, Rippingill's 50*s.* oil hot-water stove.—Address, A. H. SALMON, 29, St. Swithin's-lane, E.C.

Wanted, 9×7 Ross's rapid symmetrical, will exchange for first-class double canoe, paddle or sailing, complete.—Address, H. MOSEL, Market-place, Nottingham.

I will exchange violin and bow in ebonised case for a half-plate camera with all movements.—Address, R. MERRETT, Photographer, Russle-street, Stroud, Gloucestershire.

Will exchange four-back posing-chair, excellent condition, for half-plate camera and three slides; also studio stand in exchange for burnisher or printing frame 20×16; half-plate studio camera, bellows-body, rackwork adjustment, in exchange for quarter plate set or detective camera; also rustic studio set furniture for magic lantern.—Address, BEAVAN & Co., 11, Windsor-terrace, Newport, Mon.

LEWISHAM PHOTOGRAPHIC SOCIETY.—November 4, *Lantern Slides by Reduction.*

WEST LONDON PHOTOGRAPHIC SOCIETY.—October 28, Presidential Address and Lantern.

PHOTOGRAPHIC CLUB.—November 2, Annual Meeting (members only). 9, Members' Open Night.

PUTNEY PHOTOGRAPHIC SOCIETY.—October 31, Dr. Jeserich on *Photography Applied to the Detection of Crime.* November 7: Mr. Buchanan Wollaston on *Platinum Printing Processes.*

HACKNEY PHOTOGRAPHIC SOCIETY.—November 1, *Lantern Slide Making*, by J. Carpenter (flower-study fame). 8, Members' Lantern Night. 15, 16, and 17, Exhibition at Morley Hall. 22, Open Night.

MESSRS. MIELL & RIDLEY, 3, Victoria-buildings, Old Christchurch-road Bournemouth, have purchased the whole of the negatives and goodwill of the business, for the past eight years carried on by Mr. J. Vaughan, at Firs Glen Studio, Bournemouth.

LAST week, in criticising Mr. H. P. Robinson's charming landscape, *Midsummer*, now on view at the Camera Club Exhibition, the printers made us apply to it the epithet "extraordinary." The word, however, is not misplaced in regard to the excellence of the picture, which was the quality we, of course, had in mind and intended to express.

WE understand that Herr Anschutz, of Berlin, the inventor of the hand camera bearing his name, and whose clever photographs of animals have excited such general admiration, is on a visit to this country *en route* for the United States. Opportunity was recently taken of his presence here to invite several persons, well known in the world of photography, such as Miss Catherine Weed Barnes, Mr. L. Warnerke, and others, to accompany Herr Anschutz on a photographic outing up the Thames, when an agreeable time, pleasantly diversified by camera work on river scenery, &c., was passed.

IN the Queen's Bench Division, on Wednesday, an appeal was heard against the decision of the borough magistrates in the action of the Corporation of Leicester against George Brown, photographer, of London-road. It will be remembered that in May last Mr. Brown was summoned under the Public Health Buildings and Streets Act of 1888 for having, "without the consent of the Urban Sanitary Authority, erected a wooden building with a glass front in London-road beyond the main front wall of the house or building on either side thereof in the same street." A second summons charged Mr. Brown under the same Act with having, without the consent of the authority, built a "certain addition to a certain house" occupied by him on London-road. After a long hearing the Bench fined defendant 10*s.* and costs, but, on the application of the defendant, granted a case on a point of law. In the hearing of the appeal Mr. A. Toller (instructed by the Town Clerk) appeared for the Corporation, and Mr. Rawlinson (instructed by Messrs. Parsons, Wykes, & Davis) was for defendant. After a two hours' argument Justices Pollock and Hawkins upheld the decision of the magistrates.

GREENWICH PHOTOGRAPHIC SOCIETY.—A meeting was held on Wednesday, October 19, at the Lecture Hall, Greenwich, at which Mr. E. W. Maunder, F.R.A.S., presided, "to consider the advisability of forming a Photographic Society for Greenwich." After introductory remarks by the Chairman, Mr. Haddon gave a short account of method of procedure in such societies as he was acquainted with. The Chairman, resuming, pointed out that the project was warmly supported by the officials of the Royal Observatory and Royal Naval College, and by several local amateurs. A series of propositions having been put and carried unanimously, the meeting resulted in the formation of the "Greenwich Photographic Society." The Executive will consist of the following gentlemen:—*President:* Rev. Brooke Lambert, M.A., B.C.L.—*Vice-Presidents:* Messrs. A. Haddon and H. H. Turner, M.A.—*Committee:* Messrs. E. W. Maunder, F.R.A.S.; Arthur Martin; T. Lewis, F.R.A.S.; Dr. Waghorn; J. Q. Braidwood; J. H. Kingdon; G. S. Criswick, F.R.A.S.; R. Lewis, and W. Ellis, F.R.A.S.—*Hon. Treasurer:* Mr. Charles C. Churchill, 5, Annandale-road, Greenwich.—*Hon. Secretary:* Mr. Leon J. Atkinson, 193, Greenwich-road, S.E. Applications for membership may be made to Secretary or Treasurer. Subscriptions 5*s.*, payable to Treasurer. The first meeting of the new Society will take place at the earliest possible date. Upwards of forty ladies and gentlemen have already signified their intention to join the Society.

A FIRE IN PERTH.—On October 10 the studio and the whole of the contents, besides the stock, fittings, and many valuable prints on the walls, belonging to Mr. John Henderson, photographer, Hospital-street, Perth, were destroyed by fire. The scene of the fire, a large tenement of three stories and attics, fronts Hospital-street. One of the shops is connected with the studio by a covered-in passage. About eight o'clock Mr. John Henderson, jun., who resides in Hospital-street, noticed flames issuing from the studio, and at once gave the alarm, while word was sent to the Police-office for the fire brigade. As the studio was composed entirely of wood, and contained a quantity of chemical matter, the flames made rapid progress, and by the time the fire brigade arrived, under Captain Masterton, large volumes of flames were shooting up from it. It was some time before the water could be turned on, and then all that could be done was to prevent the flames extending to the front premises. In this the firemen were only partially successful, for the passage leading to the shop gave ready ingress to the flames; but, as soon as the fire was discovered to have penetrated into the shop, water was turned on to it. The large plate-glass window was entirely shivered by the force of the water, and before the fire was got out in the shop many valuable prints on the walls were burnt. In the studio were many negatives of considerable value, but, despite everything that could be done to save them, these could not be got out; and, although the water was kept pouring on the flames, it was seen that the task of subduing them was a hopeless one, and that the fire must burn itself out. Luckily, the wind was not very high, but the heat was very oppressive, and the firemen had great difficulty in approaching the fire. The door of Mr. Henderson's house, which stands detached from the studio a distance of about a dozen yards, was scorched. The fire brigade from the Queen's Barracks arrived when the fire was nearly over, and their services were not required. All that Mr. Henderson succeeded in saving was one or two cameras. In the studio were about 30,000 negatives, the gathering of a lifetime, for Mr. Henderson's business was one of the oldest-established in the city, and they were all destroyed. Also on the walls of the studio were a large number of prints, and they were burnt. After blazing for about an hour the fire burnt itself out. Nothing was left standing. The damage to the stock is estimated at nearly 1000*l.*, although many of the negatives were so valuable that a much higher valuation might be put upon them. The studio and the contents were uninsured, but the tenement in front was insured. The origin of the fire is unknown.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," 2, *York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

Mackintosh & Co., Kelso.—*Portrait of James Henry Robert Innes-Ker, seventh Duke of Roxburghe.*

Henry Buttrum, Stony Stratford.—*North Bucks Conservative Association. Meeting of the Council at Gayhurst House on September* 28, 1892.

** Various interesting communications, "Our Editorial Table," and several answers to correspondents are held over on account of the great press of matter this week. We hope to overtake the arrears next week.

A. CHARLES.—Communicate with the local superintendent of police.

OPTICIAN.—For soldering aluminium, try chloride of silver as a flux.

A. G. R.—1 and 2. All the lenses we have seen by the maker you name have proved excellent.

S. V. W.—The information is a little difficult to obtain, but we will endeavour to obtain it for you next week.

W. OUIN.—Thanks for portrait. We are always glad to have the "counterfeit presentments" of friends in our album.

RICHARD SCRIVERS.—Many thanks, but we scarcely think a description of the clock can be of any interest to our readers.

A. B. says: "Can any one please give me a formula for bath that will give red tones to the Ilford 'printing-out' paper, or the 'collodio-chloride' emulsion paper?"

A. NEVILLE.—Albumen transparencies do not require varnishing. Indeed, they are better without. In this respect they are totally different from collodio-bromide transparencies.

J. P. J.—Domestic animals may sometimes be photographed more easily by the flashlight than they can be by daylight. But usually the picture must be secured at the first shot, as they are generally too frightened to be tried again, for some time at least.

F. JOHNSON.—Sandarac alone makes a somewhat brittle varnish for negatives. Shellac is better, but a mixture of the two resins is better still. The "new methylated spirit," or rather that methylated under the new regulations, will do quite well as a solvent.

TOMPO says:—"1. How would you test a gas bag in order to find out whether it is free from leakage (oxygen)? 2. Would you consider whole-plate rectilinear suitable for lantern, long distance, with limelight?"—1. Simply with water. 2. No; better use a portrait lens.

W. L. CUMMINS.—By consulting pp. 856,857 of the ALMANAC for 1892, you will find tables that will enable you to convert the French into English weights and measures. The solution referred to is for development, the potassium chloride being used to influence the tone.

B. LABES says: "In your last issue I find an article about Retouching by Electricity. Being desirous of obtaining a pencil of that kind, I should be pleased if you would forward particulars, price, &c."—You had better apply to Messrs. E. & H. P. Anthony & Co., of New York.

R. W.—No special treatment or precautions are necessary in taking frost pictures beyond the adoption of the same care in the development that is always required to secure a good negative. Give a full exposure, but do not over-expose. If opportunity will permit, use the camera on a stand in preference to holding it in the hand.

OLD SUBSCRIBER says: "Will you say which of the mechanical processes you would consider best for a photographer to introduce, *i.e.*, for reproducing groups, photographs, or views in quantities from original negatives, both cheaply and expeditiously, consistent with best results?"—Undoubtedly th collotype process would be the most suitable for your purpose.

O. P. T.—Only duly qualified pharmaceutical chemists are allowed to sell the poisons mentioned in your list, and then only when certain conditions are complied with. The chemicals being employed for photographic purposes makes no difference whatever. Others certainly sell them, as some of them may be had at the oilshops, but the vendor does it at his own risk—a heavy penalty.

D. BARNICOTT says: "I notice in your issue of THE BRITISH JOURNAL OF PHOTOGRAPHY for September 16, 1892, No. 1689, you have a leader on a mountant, in which you mention Opie's Medium. Will you kindly inform me where I can obtain this?"—The "medium" in question is not, so far as we are aware, an article of commerce. It is known in the vulgate as "brains."

BEGINNER says: "Being interested in and desirous of obtaining a knowledge of the art of photography, I should feel much obliged if you would tell me where I could get a book on the subject—one that would give good information to a beginner, and that would be not too expensive."—Read the elementary chapters addressed to a beginner in the last volume of the ALMANAC.

H. SIMMONS.—We are not aware of any sponge lamps burning benzoline that are preferable to the ordinary ones consuming paraffin oil, or indeed that are at all suitable for the purpose. We have seen large lamps on the sponge-lamp principle with a multiplicity of wicks that give excellent illumination in a room. The light, however, was not nearly so well adapted for the lantern purposes as the usual ones with which it is usually fitted.

J. R. G.—It is somewhat difficult to say the exact cause of failure from the data given. It would seem, however, to be due to an unsuitable pyroxyline and an insufficiency of bromide of silver in the emulsion. The latter would be the case if the whole of the bromide salts did not dissolve. As you fail with the double salt, and succeed with the zinc bromide, we should advise you to keep to that, and try two or three fresh samples of pyroxyline.

T. HINE.—Plates that have been exposed to light can be treated so that they are again made fit for negatives; but, as plates are now so cheap, no one cares to go to the trouble of restoring spoilt plates. If it is not worth the while of makers, who have all appliances ready to hand, to do so, it may be taken for granted that it is not worth a photographer's while to fit up the necessary drying and other arrangements to deal with a few dozen injured plates?

PYRO sends a number of prints, several of which show large yellow patches on the surface, while others out of the same batch do not. He asks the reason. —The yellowness is clearly due to imperfect fixation. Most of the prints that our correspondent considers free from the evil are not really so, as they show decided yellow in places when examined by transmitted light. Either the time of immersion in the hyposulphite bath was too brief, or the solution was not strong enough. The remedy is obvious.

A. FLINT says: "Would you assist me by giving me the particulars, or let me know where I can obtain a good flashlight for studio work at a fairly moderate price, not to exceed ten pounds, or thereabouts. My studio is only about eight feet six inches wide by seventeen feet long, so I have not much width for reflectors. What I want is a lamp that will give first-class results.—There are several such on the market, but it is not our rule to give preference to any single one. Call at two or three dealer's, and you will no doubt be able to suit yourself.

B. M. (Auglet, France).—"May I ask your advice in a dilemma? I am greatly annoyed of late to find pinholes, and even large ones, on the surface of my plates after developing and fixing. I do not remark them until the plate has been fixed. I use the utmost caution both in developing and washing, and cannot see where these pinholes come from. In some cases the spots are as large as a pea."—The trouble arises from dust on the plates, or air-bubbles adhering to the film during development. Probably the two combined—the large spots from the latter, and the small pinholes from the former.

L. A. S.—It is perfectly true, as you have been told, that carbon pictures may, if kept against a damp wall, become mildewed; but the chances of their doing so are somewhat remote. Engravings kept under similar conditions may also become mouldy. Mildewed engravings are by no means uncommon. Under the conditions of moisture, assisted by warmth—the conditions of an ordinary dwelling-room that is damp—carbon pictures will suffer infinitely less than will silver prints, whether on albumen or gelatine paper. So far as permanency is concerned, there is no difference between engravings and photogravures.

H. SINGLETON complains that the oil lamp of his lantern gives off a very unpleasant odour when alight, and asks if this is common to all lamps burning paraffin oil.—It is, unless they are kept scrupulously clean. In most cases the smell proceeds from oil on the outside of the lamp and its fittings. In all cases every part of the lamp should be carefully wiped with a clean cloth just before it is lighted, and the wicks carefully trimmed. When the lamp is finished with, all oil should be drained out, to be refilled only when again required for use. If these points be attended to and good oil used, there will be but little, if any, offensive fumes given off.

A. C. says he cannot succeed in making a solution of indiarubber in benzole, although he has tried several kinds (not vulcanised) of rubber. The rubber, he adds, swells up something like gelatine does in water, but it does not dissolve.—All kinds of rubber do not dissolve readily in benzole; but, if what is known as "masticated rubber" be used, there will be no difficulty with ordinary benzole. The most convenient way to obtain a solution of indiarubber is to purchase a tin of the ordinary "solution," such as that sold by Hancocks and others for repairing macintoshes and suchlike things, and dilute it with benzole to the consistence required. This will sometimes save a deal of trouble.

REX says: "I purchased a lens (front) for magic lantern. Back lens is two inches diameter. It is one of the ordinary kind, with flap shutter. The focus is four inches. I am dissatisfied with its performance, as the picture, when projected on the screen, is not sharp at the edges or margin of the screen. When the centre is sharp the sides are blunt, and *vice versâ*. How can I remedy this defect, as the lens is new and cost about a guinea? If one of the lenses of the combination requires a new one, please say which, and the probable cost, and if a longer focus than the four-inch would be desirable."—No advice that we could give you would improve the lens. Return it to the vendor and endeavour to let him have one with a flatter field.

E. H. W. says: "I had in two reams of albumenised paper, from which I have been using for some time past. I now find that water from a leaky pipe has been trickling on to the bench where the paper has laid. The consequence is, that the wet has penetrated about half way up the lot, and stuck the sheets together, so that they can only be separated with difficulty, and then the surface looks dull in places when the paper is dried. What can be done, as, unless I can make the paper usable, the loss will be serious to me, as I am only in a small way of business?"—The circumstance is unfortunate, and we fear there is no remedy. Our impression is, that it will be cheaper in the end to discard the paper altogether than to sensitise it, as much of it will afterwards have to be wasted. When once albumen ha become damp, it is of very little use.

FORTHCOMING EXHIBITIONS.

November 10–12..... *Leytonstone Camera Club. Hon. Secretary, A. E. Bailey, South West-road, Leytonstone.
,, 15–17..... *Hackney Photographic Society. Hon. Secretary, W. Fenton Jones, 12, King Edward-road, Hackney.
,, 17–19..... Brixton and Clapham Camera Club. Hon. Secretary, F. W. Levett, 74, Geneva-road, Brixton, S.W.
North Middlesex Photographic Society.
,, 18–26..... *Stanley Show (Photographic Section). Hon. Secretary, Herbert Smith, 29, Finsbury-pavement.
,, 23–25..... *Tunbridge Wells Amateur Photographic Association. Hon. Secretary, Joseph Chamberlain, 14, Calverly Park-gardens, Tunbridge Wells.
,, 24–26..... *Exeter Amateur Photographic Society. Hon. Secretary, J. Sparshatt, Fairfield House, Alphington-road, Exeter.
*South London Photographic Society. Hon. Secretary, C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.

* Signifies that there are open classes.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1696. Vol. XXXIX.—NOVEMBER 4, 1892.

GELATINE *VERSUS* STARCH AS A MOUNTANT.

The majority of photographers employ starch paste for mounting pictures, while professional print-mounters, as a rule, use gelatine, or, more often perhaps, common glue. Several have at times remarked to us that they would prefer gelatine as a mountant if it were not so difficult to manage. In practice, however, when the proper conditions are understood, the difficulties prove more imaginary than real. It has frequently been stated that prints mounted with gelatine last longer than those mounted with starch. This is probably the case when the mounts contain injurious matters, as the layer of intervening gelatine is a better insulator than one of starch. This better insulating property is also a great advantage with some of the deeply coloured mounts in which the colouring matter is partially soluble in water. If with such mounts starch be used, there is a danger of the whites in vignetted prints becoming stained, whereas, if gelatine be employed, the trouble will, except in very bad cases, be avoided, because before the pigmented coating on the mount has become fairly wetted the gelatine has set, and, so to speak, formed a protecting layer.

Many who have tried gelatine as a mountant have failed to use it successfully. The failure, however, can generally be traced to one or other of two causes, or, perhaps, the two combined. The first is the employment of an unsuitable gelatine; the second, using too thick a solution. Some would consider that for the present purpose the highest class of gelatine should be employed. This is a mistake, for the very lowest is by far the best for the work. If a solution of one of the highest qualities of gelatines, such, for example, as those used for dry plates, be made and applied to the back of a print, it will be found that before the whole can be evenly coated, even when its dimensions are small, that which was first applied has set, and when once it has set it has lost the greater part of its adhesiveness, and can then only be made to adhere, if at all, by heavy pressure or hard rubbing. This trouble may to a certain extent, it is true, be mitigated by diluting the solution, but it does not overcome it.

If, instead of using a gelatine of the character just referred to, we take common glue, as sold in the shops at a few pence a pound, and make a solution of that of the same strength as the gelatine, and use it at a similar temperature, we shall find no difficulty in coating even large prints before any portions begin to gelatinise. For this reason common glue, in practice, proves more adhesive than the finest quality of gelatine. Reference has just been made to failures arising from the employment of too strong a solution. The stronger it is the quicker it will set, while very dilute solutions will require a comparatively long time before they will assume a jellied condition. So adhesive is this material, that those who have not tried it will be surprised how weak a solution of common glue will serve for sticking papers together.

Reference has been made to common glue; but, be it understood, only as an example of its properties as compared with those of the best gelatines. It will be manifest to all who know anything of the subject that its employment for mounting silver prints should be eschewed if their permanence is a consideration, owing to the impurities with which it is always contaminated. It is, also, almost invariably acid, as, indeed, are the highest qualities of foreign gelatine, which, quite apart from their quick-setting properties, render them unfit for mounting photographs. It will now be seen that what is required for the purpose is a pure kind of gelatine with the mechanical properties of the common glue. This we can obtain in some of the gelatines of British manufacture. They are known commercially under the name of "soup gelatine" or "soup strengthener." Nelson's, Cox's, and other firms supply such gelatines, and they can be relied upon, while, at the same time, they are very inexpensive. The first-named firm also supply a gelatine known as "No. 2 soluble." This is an excellent gelatine for the purpose, as it combines purity with slow-setting properties. It may almost be taken for granted that English gelatines of fair quality are always neutral, while foreign ones are invariably acid.

It is impossible to give a definite formula for making a solution, as different samples of gelatine vary so much; but the weaker it is, so long as it will stick, the more convenient it will be to use, and the less heat will be required to retain it in a fluid state. As a rough guide, it may be mentioned that such a proportion as will form a weak, though not too tremulous, jelly after standing in a cool place all night, will be found most convenient in every way. It may also be mentioned in connexion with the strength of the solution that the more dilute it is the shorter will be the time it will keep without decomposition. Hence it is desirable, when preparing several days' supply, to add an antiseptic, such as a few drops of oil of cloves, or, better still, a little methylated alcohol. Alcohol can not only be used as an antiseptic, but it can be made largely to take the place of water in the solution. An adhesive, so prepared, is extensively used for mounting prints on boards with a clear margin so as to avoid the cockling of the mount; but, as this portion of the subject has been so frequently dealt with, it need not be referred to on this occasion.

One other matter may, however, be alluded to in connexion with the use of gelatine—namely, mounting photographs in optical contact with glass. Some have employed the higher classes of foreign gelatines on account of their whiteness and trans-

parency. To this fact may be attributed the difficulties many have experienced in the work, and also the existence of so many fading pictures. These gelatines, as we have just said, are difficult of application, and, by reason of their acidity, conducive to fading. However, by employing the class just recommended these inconveniences are avoided, while the purity of the whites of the prints will in no way suffer from the apparent slight opacity and trifling tint of the gelatine.

DAMP AND GELATINO-CHLORIDE PAPER.

Since writing a fortnight ago on *The Storage and Treatment of Sensitised Paper*, the weather has been in every way favourable for experimenting on the effects of damp, and we have consequently been endeavouring to demonstrate graphically the deleterious influence of moisture in the atmosphere upon our more modern sensitised papers.

Selecting a number of felt pads of half-plate size, these were placed in the kitchen oven for several hours until thoroughly dry, and were then found to average very slightly over two hundred grains each when weighed. They were then hung up for a couple of days in a room without a fire in order that they might absorb as much moisture as possible, or acquire as nearly as might be the characteristics of carelessly kept pads. When again weighed they were found to have increased in weight to the extent of close upon thirty grains each, or nearly one-sixth of the total weight of the pad had been absorbed in the form of moisture.

To the touch there was no feeling of dampness nor any appearance to lead to the suspicion that the pads were anything but "bone dry" and yet when held to the fire, steam or vapour was given off freely and continued to be evolved for upwards of half an hour, showing how difficult it is to thoroughly eliminate the moisture from such thick material.

In order to practically test the effect of such damp backing upon various kinds of paper, samples of ordinary "ready-sensitised" as well as freshly sensitised albumen paper, two commercial brands of gelatino-chloride "printing-out" paper, and one of collodio-chloride paper were selected for trial, and as a contrast a piece of gelatino-bromide paper intended for development was put through the same treatment in order to demonstrate the influence exercised by the soluble matter contained in the various films.

Pieces of the respective papers were placed in printing frames backed up with the damp felt pads, but with a strip of tinfoil placed across the centre of each in order to isolate a portion of the surface from the possible action of moisture. The commercial papers were used in the state in which they came from the package, and those of home preparation were just thoroughly dried and then submitted to the atmosphere for a quarter of an hour in order to allow them to absorb the amount of moisture necessary for satisfactory printing.

With the exception of the gelatino-bromide paper, the other samples were printed in the ordinary manner, and under precisely similar conditions, and when the printing was finished the frames were set on one side for a week without removing the prints. The gelatino-bromide paper received an exposure to artificial light and was then placed with the rest, receiving precisely similar treatment.

At the end of the week the last-named paper was developed, and, beyond the fact that it was sensibly more "limp" than a fresh piece taken directly from the original packet, it differed in no way from the latter in its behaviour, showing that at least during the period of a week no ill effect accrued from the action of damp. This, it must be observed, is in the entire absence of soluble matter.

Turning to the printing-out paper, the two samples of albumenised were first examined. The ready-sensitised exhibited at this stage no visible traces of the effect of moisture, the preservative material employed in the manufacture sufficing to keep the colour of the paper intact; but the home-sensitised sample showed a very palpable band of purer colour where the tinfoil had protected it. Looking at the back of the paper, a very decided yellow colour pervaded the whole of the unprotected portions, while even under the tinfoil a slight yellowing had taken place.

In the case of the two samples of gelatino-chloride paper, the effect was somewhat different and rather curious. No discolouration in the sense of yellowing was noticeable either on the print itself or on the reverse side of the paper; but, on examining the gelatine surface, there was distinct evidence of a sort of "bronzing" or metallic iridescence on the unprotected portions, and showing clearly by a distinct line against the portion where the tinfoil had been. The effect was more marked in one case than the other, but was sufficiently plain in both to leave no doubt as to the protective influence of the tinfoil.

To show that the effect of moisture does not show itself only with such highly organic compounds as those of silver with albumen or gelatine, it may be recorded that the collodio-chloride paper was at this stage more strongly discoloured than any of the others; and not only so, but the injury produced proved to be more permanent, that is to say, the yellowing produced upon the albumenised paper disappeared in the subsequent toning, which was not the case with collodio-chloride, nor was the "bronzing" effect in the latter instance reduced to the same extent as with gelatino-chloride.

The whole of the prints were then toned and fixed, and the results were similar in character throughout. Where the protective tinfoil had been, the toning was not only more rapid, but a better colour was produced, and the protected portions were entirely free from a slight metallic surface lustre that pervaded the whole of the remaining portions. This was not so noticeable as the difference in tone produced by the damp, the latter being, of course, emphasised by the sharp line of demarcation; but both effects were sufficiently pronounced to spoil the quality of an otherwise perfect print.

We commend these experiments to the attention of our readers who may still be engaged in printing operations, and would strongly urge them to look carefully to the condition of their printing frames and pads.

The National Association of Professional Photographers.—We are informed by the Secretary that the Council of the National Association of Professional Photographers will meet on Wednesday, November 9, 1892, at Anderton's Hotel, Fleet-street, London, 7 p.m., for general business, and that the presence of *all members of the profession*, whether belonging to the Association or not, is earnestly desired and invited. The chair will be taken by Mr. Thomas Fall (London), the President, and the Secretary, D. J. McNeill, 47, Charlotte-road, Birmingham, will be pleased to receive communications and to reply to inquiries.

Glass-lined Tubes.—We recently chronicled a new variety of glass-ware in the shape of vessels of that material in which woven wire was embedded. The latest application of glass is in the manufacture of tubes, in which it forms the lining material. Messrs.

Dan Rylands & Co., Limited, are now making these tubes in a large variety of sizes. The tubes are made bent and T-shape as well as straight, and the company recommend them for household service, as by their use no danger of lead-poisoning can arise. They are stated to be safe from cracking by frost or any reasonable amount of hard wear. The joints between the lengths of tube when fitted are made by washers of guttapercha or other suitable material. It is evident that such tubes might be put to a variety of services of great value in photography.

A Discovery.—The Paris correspondent of the *Daily Telegraph* says: "Experiments in photography made by the Duc de Morny in his amateur studio at Levallois-Perret have led to a useful discovery. He has been able to photographically impress paper of any size or thickness. By this means a likeness can be fixed like a monogram on note-paper and on railway or other tickets. Eighty different *silhouettes* can be taken in a minute, and at small cost. The Duc de Morny has communicated his discovery to the Minister of War, who intends to utilise it in the 'books' carried by soldiers, and in which their descriptions, records of service, and so on are inscribed. The Russian Grand Dukes now in Paris have also decided to adopt the invention in the army of the Czar, and have asked the inventor to send one of his 'collaborators' to St. Petersburg." We await particulars of this "useful discovery," which, however, we conjecture is not new.

Discoveries in Astronomy by Photographic Means.—There is, however, no doubt that photography has recently played a very important part in scientific star detection, M. Charlois, of Nice, having discovered two more small planets, and Dr. Max Wolf, of Heidelberg, two others. Both observers made their discoveries on the same day, the 25th of September last. The aid of photography has been recommended to be called in with regard to the alleged newly discovered fifth satellite of Jupiter. It has been positively alleged that an additional satellite has been glimpsed in the telescope, but with regard to it, Mr. Plummer, the director of the Liverpool Observatory, says there are not wanting circumstances to make one hesitate before accepting its existence as a fact. Fortunately,' he continues, 'there remains one means of settling any ambiguity. It will offer a problem of no great difficulty to Mr. Isaac Roberts to take a few photographs of the district through which Jupiter has passed, and see what thirteen-magnitude stars lie sufficiently near the place of the planet to be mistaken for satellites on the night in question.

The Largest Telescope in the World.—There have been so many rumours about a new telescope, not to speak of the official notification recently described by us under the heading of "Wanted, a Big Telescope Donor," that there will be a certain amount of satisfaction in learning that it is an actual fact that the order is given for the "Largest Telescope in the World." It is for the University of Chicago, and is the gift of Mr. Charles T. Yerkes of that city, who said, "Get the best glass in the world, and send in the bill." It is estimated that this "bill" will amount to half a million of dollars, if not more. A very modest estimate, we should be inclined to say, when all the conditions and surroundings are taken into consideration. Mr. Burnham, Professor G. E. Hale, of the Kenwood Observatory, and Dr. Harper have consulted with Mr. Alvan G. Clark, and it has been decided to have a telescope with an object-glass of forty-five inches aperture, which, it will be seen, represents a light-collecting area about half as large again as the great Lick Telescope.

Noah's Ark.—Mr. Green, whose name is rather a suspicious one, writes to know if he can buy photographs of the original Noah's Ark. Lest our readers may not be aware what the reference amounts to we may say that the reverend gentleman named has written that on April 25 last he climbed Mount Ararat, discovered the Ark, walked round it with six companions, and contemplated it from various points of view. He was almost overcome, and was filled with gratitude. M. H. Cadoux ascended the mountain six weeks later, but found no trace of human work except what the Russian explorers had left, and he was further told that it was inaccessible in April. We really do not think we could give a better reply than a transcript of the words of the well-known scientific expert who writes to the *English Mechanic* under the pen name of "A Fellow of the Royal Astronomical Society." He thus says: "It seems to me a slight chronological mistake has crept into the account of Archdeacon J. J. Norris's discovery of the Ark . . . . Undoubtedly the discovery was made on the *First* of April, and not the twenty-fifth . . . . By a strange coincidence a gentleman named Annanias Okes on the very same day, after a gale of wind, picked up a dozen or two of the linch-pins out of Pharoah's chariots on the shore of the Red Sea; and by an even more curious coincidence a highly respectable tradesman in Wardour-street succeeded in securing the very sword that Balaam wished for." *Verbum sap.*

HAS ALBUMEN RECEIVED ITS DEATH-BLOW?

It will be remembered that three weeks ago, and as an append to a letter from the Britannia Works Co., relative to the uniformity of the tones obtainable on the Ilford Printing-out Paper (the 'P.O.P.' as it is usually termed), we spoke in terms endorsing their statement of this quality. This we did after a careful examination of from four to five dozen cabinet portraits which bore the name of W. H. Midwinter & Co., Bristol.

There was something so exquisitely beautiful and delicate, and vigorous withal about these pictures that we felt impelled to address a request to Mr. Midwinter for detailed information concerning his *modus operandi* for publication either in the JOURNAL or ALMANAC, or both, as we saw occasion. To this a courteous response was made, with an offer, should we find it convenient to visit his establishment, to afford us every facility for witnessing the whole of his operations from beginning to end, an offer of which we promptly availed ourselves.

From the high position Mr. Midwinter occupies in the profession and his long experience in photography we consider him, more than many others, entitled to speak with authority, a feeling that has been strengthened since we spent a forenoon in his admirably fitted-up ateliers in 48, Park-street, Bristol.

Conversing on the subject generally of our visit, we were informed that for a considerable time albumen had been entirely banished from his place, his printing now being confined to gelatine 'P.O.P.' and platinum. Information of this nature coming from such a representative man augured ill, we thought, for the long-continued tenure of the sway that albumen has had without any rival worthy of the name for these forty years past. Good old albumen! It has served us well during its reign; and, in the prospect of its being sooner or later deposed, we must endeavour to overlook demerits inseparable from its nature, and cherish its memory as that of an old friend who has rendered us good service. It is perhaps premature to cry, 'The king is dead! Long live the king!' but, remembering our forecast many years ago concerning the chances of collodion retreating in favour of gelatine as a factor in making negatives, we imagine that in course of time, and that too at a not distant period, albumen as an agent in printing will have to retire from the prominent position it has so long occupied.

Like so many other establishments, the printing room of Mr. Midwinter is covered in with glass, and it has the usual facilities for changing and filling the printing frames. It was, however, the subsequent treatment of the prints in which we were now more peculiarly interested.

Examining a few dozen prints as taken from the frames, we found that, contrary to the custom of some who use gelatino-chloride paper, these were slightly over-printed, not very much so, but to rather a less extent than adopted by experienced albumen printers. In the toning room, which is large and roomy, the utmost cleanliness and method prevail. Along one wall, that in which the windows are, there are ranged six slate tanks side by side. Above each there are water-taps, and in the bottom are two outlets, one to permit of relegating valuable waste to its suitable receptacle, the other communicating with the sewers. We observed that no sooner had a tank been done with than it was thoroughly washed, sides and bottom, with a large sponge; and we further observed that separate sets of

sponges and brushes are employed for the various tanks; thus, the brush for the hypo tank could not possibly be used in any but its own, unless one were wilfully to ignore the lettering on its back. This cleanliness and method are perhaps due to the fact of Mr. Midwinter having in early life graduated in a chemist's establishment, where, above all places, cleanliness and method must reign supreme.

The first operation was to immerse the prints one by one in a water bath, from which, after a good soaking, they were transferred to the alum bath. This consists of—

Alum	4 ounces.
Water	80 „

The chief printer—a most intelligent man—told us that he had at first adhered to the directions issued with the paper, which recommended *eight* ounces of alum to this quantity of water, but that he had reduced the strength to four ounces without any discoverable disadvantage. After remaining in the alum solution for ten minutes, the prints were then subjected to a wash in a succession of three changes of water. This washing was not done in a perfunctory, but in a thorough, manner. At this stage the prints had lost the purple tone they had when taken from the printing frame, and had acquired a red colour similar to that which albumen prints have at the stage after being immersed in a solution of chloride of sodium or acetic acid previous to being toned—a custom adopted by some.

The toning bath consists of—

Sulphocyanide of ammonium	30 grains.
Water	16 ounces.
Chloride of gold	2 grains.

Of this a quantity sufficient is poured into the toning dish to give the prints plenty of room in which to float about without danger of one sticking to the other. Mr. Midwinter strongly urged this as an important point both in convenience of working and as ensuring uniformity of tone. We noticed that in measuring out the toning solution two-thirds of the bath used the day previous were taken and refreshed with one-third of a new bath. This we think is an excellent system, viewed either economically or from the point of convenience, for in our estimation some of the toning baths employed with gelatino-chloride paper act too energetically to enable the requisite care to be taken in seeing that, when a considerable number of prints are being manipulated by one person, due care is taken in ensuring uniformity. How otherwise could it be when contrasted with the helter-skelter turning over of prints, accompanied by a fear to devote more than a very few seconds to the examination of any one print in case the others are in the meantime getting spoilt by over-toning? No occasion for such hurry when the toning solution is prepared as described. The printer here had time both to keep the prints in motion and to carefully and critically examine each one, which he did by transmitted light, holding it up against a gas-flame before him. The average time for a print to acquire a purple black tone is about from eight to ten minutes. During these various operations the prints were kept almost invariably face down in the various solutions.

The fixing bath consists of three ounces of hyposulphite of soda to the pint of water. The best quality of soda procurable, although costing somewhat more than that of average quality, is alone employed, as it is found cheapest in the long run, and Mr. Midwinter has been taught by experience that ten minutes in a solution of the above strength is sufficient to ensure the prints being thoroughly fixed. They are then washed for two hours in running water.

Let us pause for a moment to speak of the influence exerted by a bad sample of hypo upon the future of a print. Only a short time ago there was a perfect epidemic of spots on albumenised prints. Complaints respecting this reached us almost daily and from sources widely apart. No matter what care was taken or what brand of albumenised paper was employed, the plague prevailed. An observant professional friend in the North found that the prevalence of the spots in his case was concurrent with his using a certain kind of hypo which he had recently purchased. Acting on a surmise, he made two fixing baths, one with an old and the other with the new purchase. A brief period sufficed to establish the fact that the spots were attributable exclusively to the soda most recently procured. *How* it acted he could not tell; but that, in his case at any rate, it was the cause of the spotted prints he felt well assured. The subsequent employment of another sample ensured freedom from all farther annoyance. We have written this *apropos* of Mr. Midwinter's care in using anything but the best quality of hypo.

With regard to the toning bath, forty-eight grains of gold for toning forty-two sheets of paper, and toning them well, cannot be considered otherwise than as being strictly economical. This, we were informed, is the proportion indicated by experience. There was no mealiness or defects of like nature apparent in any of the work done under the conditions described; indeed, we were told that such is altogether unknown.

The mounting is performed in the manner in common practice by many, that is, the prints are taken from the water and piled, face down, one on the top of the other. The surplus water is removed by gentle pressure on the top, but not to such an extent as to cause adhesion between them; starch is applied to the top one, which is then attached to the mount, and so on to the end. After spotting, they are placed in a grooved box, to remain for burnishing, which is done the next morning. The grooved box has a perforated zinc bottom, and a drawer below in which two or more wet sponges are contained, the object being to prevent the prints becoming quite desiccated, which is inimical to their ultimately taking on the highest finish.

The burnisher, which acts the part rather of a hot roller than a burnisher pure and simple, is one of that form known as the Quadruplex Enameller, made by a Chicago firm. Having been passed through this a few times, the prints acquire a high glaze and finish; and to prevent any curling they are laid, face down, on a wooden table until cold; when taken up, they are quite flat. No lubricant is employed.

In the foregoing remarks we have given, in as brief a manner as possible, an account of the way in which we saw many gems of pictorial art produced. It is, however, proper that we should say that the negatives are pictorially and technically of great excellence. The former is doubtless owing to the fact that Mr. Midwinter, previous to becoming a photographer, had, on his return from the Crimean War, through which he had passed, gone in for an art education, and graduated as a painter; the latter is a consequence of care, method, and a knowledge of what a photograph should be.

Before leaving, we had a look over the studio and adjoining rooms. the studio has a "lean-to" roof, fitted with double—nay, with quadruple spring roller blinds, one pair of white and blue overlapping each other, and either of them capable of being raised or let down. There is also a side vertical light, looking on a garden the wall of which, with its trailing plants and boulders, seems well adapted for the posing of large groups against.

Mr. Harvey, the operator, a near relative of the proprietor, who has been since youth with the firm, seems to have the art of lighting and posing the sitter at his fingers' ends, for, in an incredibly short period, he manipulated the screens so as to produce any effect desired. The reception and adjoining rooms are decorated with the choicest examples of Mr. Midwinter's work, and forms quite an exhibition in itself.

The prices at this establishment are: 1*l.* a dozen for cabinets; 30*s.* for boudoirs; 2*l.* 2*s.* for imperials; and 3*l.* 12*s.* for panels.

In connexion with the finishing of gelatino-chloride prints, we have been shown some examples of a method adopted by Mr. W. Crooke, of Edinburgh, which imparts to the surface a delicate matt that for many purposes has a charming effect. We have not been apprised of the method employed in producing this matt, although the paper is of the same brand as that used by Mr. Midwinter. From some experiments of our own, however, since made, by interposing a film of matt celluloid between the burnisher and the photograph, which imparts the effect in question, we may suppose Mr. Crooke's method must bear some resemblance to this.

THE NEW DEVELOPER.

A FEW weeks' experience with "amidol" effectually convinces me that we have at hand still one more powerful and valuable addition to our list of photographic chemicals. Personally, I have never had

much respect for these "one-horse" developers, and having very rarely to complain of our old friend "pyro," they have not been favourite developers with me. Obviously, when working much with "shutters," something else is required at times—a developer, in fact, which may be allowed to remain on the plate, quietly doing its work, without unduly veiling the same.

The formula supplied by the makers is, I think, the best for the purpose, though, for those who have a fondness for the metabisulphite of potassium, *may* be used, if they wish, a small quantity of this salt, in place of the soda sulphite. A little experience here may not be out of place. The potass metabisulphite (80 grains in place of 800, of soda sulphite) was dissolved in eight ounces of water; eighty grains of amidol then added, the proper dilution followed, and a plate immersed—it remained submerged with the usual rocking for some fifteen minutes, when, no image appearing, the plate was removed, washed, and a sulpho-pyro ammonia developer mixed and applied. The result was satisfactory, but on getting into daylight I found my fingers badly stained a metallic-looking black stain, rather troublesome to remove. The amidol solution was neutralised afterwards with carbonate of soda, and has since developed several plates without trouble. However, I don't recommend metabisulphite in conjunction with amidol—it *will* do; but, if *fresh* and strong, it must be estimated to be twenty times the strength of sulphite of soda at least.

With the sulphite the developer is, in every way, as described by the makers, giving clear shadows a sufficiency of density, with a pleasing tone, conducive to quick printing, and is, without doubt, superior to pyro for certain exposures and subjects. As an instance, two plates, exposed on an interior, and receiving rather less exposure than would ordinarily be given, were developed, one with pyro and the other with amidol; the pyro was used in the way suggested by some years' experience, but there is halation and a want of detail in the shadows; the amidol-developed plate shows much less halation and more detail, but the development occupied perhaps twice the time. I find "rocking" still necessary as ever; it is not safe to leave the plate resting calmly in the solution; hence, unless one has a "rocker," it is tiring work; but all developers are much the same in this respect.

Finally, if any prematurely grey reader wants a good and cheap hair dye, let him try an amidol-meta-bisulphite-cum-pyrogallol-et-ammonia developer.

J. Pike.

CLOUD NEGATIVES, AND HOW TO RECORD THEIR LIGHTING.

[Greenock Camera Club.]

Every one has observed the unfinished appearance of an ordinary photographic print, because of the more or less flat white sky which surmounts it. This is, perhaps, all the more apparent when the subject-matter of the landscape has been well composed and lit. As the artistic sense increases, and we become more familiar with the camera, and acquire some knowledge of the various processes involved in the making of a good negative, we also become more and more convinced that the pictures we have made represent little more than half the picture presented to the eye at the time of exposure; in fact, we begin to see with other photographers, who are art critics as well, that, however beautiful the landscape may otherwise be, it wants that compliment—those beautiful clouds which stretch above the horizon and make the picture a complete whole.

No doubt there are times when the sky is cloudless, and when it would be improper to show clouds, but the reverse is generally the case in this rainy country of ours. Therefore when we strive to produce pictures true to nature, we should not forget the cloud effects with all their delicate tints and tracery. The combination is charming, as all who have examined such photographs will admit. When the clouds are well balanced and well selected for the landscape, a picture, which is otherwise not technically so good, will be more pleasing than another which is better in this respect, but which is surmounted by a white patch of sky. Hence the aim and ambition of most good photographers for some years back has been to introduce clouds into their pictures, thus reproducing scenes from nature in their best and most pleasing aspects.

Unfortunately there is considerable difficulty experienced when we try to represent clouds in our photographs. This is not quite apparent at first sight, but a little consideration will show that it must be so. In developing a landscape negative the sky is always the first to appear, and, if we watch closely, delicate clouds will be seen to make their appearance as development proceeds. Were we to wash and fix the negative at this stage, we would doubtless have a fair representation of the clouds, but unfortunately the rest of the picture would be hopelessly under-exposed. On the other hand, when we carry development to its final stage, so as to bring out all detail in the landscape, we get the sky black without any detail; or, perhaps, as is often the case, somewhat flat and thin. This is due to over-exposure, and cannot well be avoided, except perhaps in strongly lit instantaneous subjects. The fact is that so much more light is reflected from the sky compared with that reflected from an ordinary landscape, that when the latter is properly exposed the former is over-exposed, and *vice versâ:* when the sky is properly exposed, the landscape is under-exposed.

Numerous attempts have been made to overcome this difficulty. Doubtless the best method which has been suggested is to take two negatives of the subject—one exposed for the landscape, and the other for the sky or clouds. The sky is then blocked out from one negative and the landscape from the other; and the print made by exposing twice, once with each negative, due care being taken to ensure that the join of the sky-line will not be observed in the finished print. It sometimes happens, as I have said, that there are no clouds when the negative is taken; more often, that the clouds are wanting in roundness, or sharpness, or variety; or perhaps there are too many, or they may be too dense, or too continuous to form a pleasing combination; and we feel that, if the clouds were just otherwise than they are, we might be tempted to expose two plates.

But another consideration comes in here. The power and endurance of even the enthusiastic amateur is limited, and he objects to carry more than six plates (if the camera be larger than quarter-plate), even if he has more slides to put them in; and so he likes to carry home six landscapes instead of three, as he would do were he to expose two on each view. I know that many photographers would rebel at this dictum, because their motto is to produce a few pictures and do them *well*, rather than a great number only half done. And I am not going to quarrel with these gentlemen; in fact, I sympathise with them thoroughly. At the same time, the amateur whose only opportunity for practising photography is an occasional Saturday afternoon, and a few holidays, must be excused if he objects to expose his plates in this fashion; because, with his limited opportunities—even with the aid of exposure tables and meters—he generally finds that out of six plates he seldom gets more than three or four passable negatives, which would be reduced to one or two were he to devote half his plates to the clouds. The case may be different when one has a roll-holder capable of carrying twenty or thirty films. Then, I would say, make two exposures on each subject when necessary. But we do not all possess roll-holders, and we are at present only considering negatives taken on ordinary glass plates, although what is said with regard to the one is equally applicable to the other.

It has been said that with proper exposure and careful development it *is* possible to obtain clouds and landscape on one plate, but the difficulties are so many that I fear even the "old hands" would shrink from the necessary labour and manipulation. The method which has found most favour, and now generally practised, is that in which negatives of clouds are taken on favourable days independently of the landscape. These negatives are carefully developed and stored away, to be combined with any landscape with which they will harmonise by the masking system and double printing. Of course the negatives of clouds must be lit from the same side as the landscape with which it is to be combined, consequently we must have a stock of such negatives photographed with relation to the lighting in as many ways as we can photograph a landscape. Our stock must also be considerable to enable us to make a selection, and we will require to proceed in a methodical and systematic manner in order to secure it. Some have suggested that this may be done by pointing the camera out of an attic window, and photographing the clouds overhead. Such procedure might be excusable in the case of one confined to a large and smoky city, but most amateurs will prefer to go out into the country in search of cloud subjects. Zenith clouds, even although they may be good as landscapes, are quite unsuitable for combination printing, as they cannot exhibit the same atmospheric and horizon effect to be got from clouds taken in the position which they should occupy in an ordinary landscape photograph.

A good plan is to photograph a beautiful or striking mass of clouds in the open country when one sees it, just as one would a landscape, noting carefully the cardinal direction of the clouds and the sun with relation to the camera at the time of exposure. Or one may set up his camera on a day when the clouds are suitable, and expose several plates, whilst the camera stands in the same position, allowing a certain interval of time to elapse between each exposure, so that there may be a marked difference between each cloudscape. Yet another method is to erect the camera on an elevated position, sufficiently removed from other high ground, and expose one plate in a northerly direction, slewing the camera round, and exposing another in an

easterly direction, and so on round all the points of the compass. Of course it will be necessary, when doing this, to see that only those points are chosen where suitable clouds exist, and that the position of the sun and cloudscape, with relation to the camera, is duly noted for future use.

It is best in taking cloud photographs to make certain that the camera is truly level, and the swing-back standing plumb, to insure that they combine easily with an ordinary landscape. And it is well to take them from an elevated position, so that the horizon line comes down to the middle of the plate, or even lower. The combined print will then show rather less of that dense bank of cloud which overhangs the horizon of many landscapes, an effect which will be enhanced by reason of the horizon line of the landscape coming above the centre of the plate.

With these precautions there is no great difficulty photographing cloudscapes. A small stop must be used with a quick exposure on a slow plate. The development is the same as for an ordinary landscape, taking care not to make the negative too dense. The negatives on the table were taken in the way I have described, some from a window in my house, where the camera remained pointed in one direction, allowing a sufficient interval of time between each exposure to introduce new forms as the clouds rolled past. Others were taken from the top of the Lyle Road by levelling the camera and slewing it round several degrees of arc for each exposure. I cannot say that I have been very successful in securing good effects, but the negatives serve to illustrate my remarks.

If cloud negatives are not difficult to manipulate, the case is different when we try to combine them with a landscape in one print. This is where the difficulties begin. One writer says regarding it (British Journal Almanac, 1888, p. 366, G. Smith), that "the number of prints which are spoiled before a satisfactory print is obtained is only known to those who have had their tempers tried by repeated failures." "One of the greatest difficulties in the printing in of clouds is," he says, "to prevent a sort of halo, or border of light, showing at the junction of the landscape with the sky, or round any object which may project into the sky;" and he goes on to show how this may be avoided by blocking out with opaque water colours, &c., the horizon line and such objects as rise above it. I have not tried this process of combination printing, and cannot speak as to its merits; but I have made several efforts with another process, the results of which fully confirm the remarks just quoted, for my prints were more or less failures. But I must not forget that my remarks to-night are confined to the making of cloud negatives, so I will refer those who wish to prosecute this branch of the subject further to the various excellent articles to be found in the photographic journals and almanacs, assuring them that perseverance in this direction, as in so many others, will doubtless lead to ultimate success.

Meantime we will proceed to consider another factor in taking cloud negatives, at which I have merely hinted, viz., the angular position of the cloudscape with relation to the sun, for cloud negatives would be of little use for combination printing without a proper method of recording the lighting. Photographic authorities and critics have laid down the rule—and with great reason I think—that the clouds to be printed into a landscape must be lit from the same side as the landscape itself. Unless therefore a record is kept of the compass position of the sun and clouds, our negatives will get so mixed that we will not know which to select in order to make a proper combination. In all probability the wrong negative will be chosen, and one of those combinations produced, in which the clouds are lit from the east when the landscape is lit from the west, so offensive to the eye of an artist. All that has been said with regard to the cloudscape is equally important with regard to the landscape when it is intended to print in clouds. Its relation to the sun must also be noted. Now it may be thought from this that I advocate the necessity for the photographer adding a compass to his already numerously stocked kit of accessories, to measure the angle subtended by clouds or landscape and sun. But this is not so. I wish rather to direct attention to a method by which an instrument we all carry in our pockets may be used for this purpose, with almost as much accuracy as a compass. I refer to an ordinary watch. The only condition necessary is that the watch shall be going, and keeping fairly good time. A newspaper paragraph which I read some time ago, was the means of directing my attention to the method of determining the compass points by a watch; and it is so simple that one is surprised it is not more generally known.

At noon the sun is in the meridian, which is due south from Greenwich, and therefore very nearly due south from any place in the British Isles. In the same way midnight is due north, as the sun travels twelve hours while the earth makes half a revolution. There are therefore twenty-four hours in the day. The sun travels one hour of the watch circumference for every two hours of time. Hence, to find the true north by the watch, it is only necessary to note the time in hours counting from midnight and divide by two. If now a line drawn from the centre of the watch through the hour indicated by the quotient be pointed towards the sun—or the sun's position when it is not visible—at the time of observation, twelve on the watch indicates the true north. Thus, suppose we wish to know the north at ten a.m., we divide ten by two and get five. If, now, the watch be placed horizontal, in such a position that an imaginary line projected from the centre through five o'clock points to the sun, twelve o'clock on the watch is due north, and the sun would be in the south-east by south *nearly*.

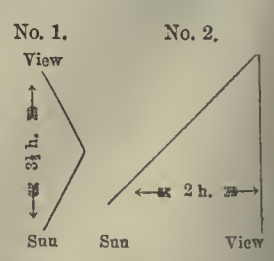
Suppose, again, that it is six p.m., counting from midnight we have eighteen hours, the half of which is nine. Again, placing the watch horizontal, and in such a position that a line radiating from the centre through nine o'clock points to the sun, the hour twelve points to true north, and the sun will be due west. Of course, when one has got the true north, all the other compass points are easily read on the watch face, and we can note at once the cardinal position of sun and cloudscape or landscape, as the case may be.

I hope I have made this plain; it is much more simple to perform than to describe the manipulation, one or two trials will make one quite familiar with it.

We have seen that it is the horizontal angle, subtended by view and sun, which is required, and the finding of the compass points by the watch is only a means to this end. Instead, therefore, of reading the angle in degrees, as might be the case were we working with a compass, and were it necessary to be very accurate in our measurements, it will be found much easier, and sufficiently accurate for all photographic purposes, to read the angle in hours of the watch, thus reducing the measurement to its simplest form.

It is best to note the position of sun and cloudscape with the watch at *the time* the cloud negative is taken, and afterwards, when the negative is developed and dried, to attach a label with all the data recorded thereon for future use. But one should also draw a small diagram on the label, showing the angular position of sun and view *in hours of arc*. This graphic method of recording the lighting makes it particularly easy to select a suitably lit cloudscape for combination with a landscape view, especially when a graphic diagram is also made of the angle subtended by sun and *view*. It is not necessary that the sun and view, and sun and cloudscape should occupy the same *absolute* positions with regard to the horizon. As long as they have the same *relative* positions, the lighting will be right in the finished print. Suppose, for instance, the sun was in the south-west when we photographed the clouds in the south-east, the angular distance would be three hours. Such a cloudscape might be combined with any landscape taken in the east when the sun was in the south, or with one taken in the south when the sun was in the west, because the angular distance between all three is just three hours, and *all are lit from the same side*. It is necessary to emphasise the last remark, for, unless the lighting of the landscape is from the same side as the lighting of the clouds, erroneous combinations will be obtained. For instance, we have seen that, with the sun in the south when a view is taken in the east, the angular distance is just three hours. But it is also three hours when the view is in the west with the sun in the south. And two such landscapes would not *both* combine with the same cloudscape whose arc was three hours, because, whilst one would be properly lit, the other would have clouds and landscape lit from opposite sides, and produce a combination quite unlike anything to be found in Nature. There are, then, right and left-lit cloudscapes for every arc, as there are right and left-lit landscapes, and we must be careful in making our selection that the lighting of both is on the same side.

We have now, I think, gone over most of the ground covered by my subject. I hope I have been able to make myself understood. The operations are all very simple, and any one with a slight knowledge of photography, bestowing a little time and consideration to the details, will soon master them. Let me conclude by referring to the diagram on the blackboard, which will enable me to supplement what I have said regarding angular distances as found by the watch and the graphic method of recording the lighting of clouds and views.



The following are two examples of the method of labelling the negative:—

No. 1.—Cloud negative. Thomas T.C. land plate. 3.40, p.m.; 14 May, 1892. Sun, about S.W.; view, N. by W.

No. 2.—Cloud negative. Paget XXX. plate. 4.5 p.m.; 14 May, 1892. Sun, about S.W. by W.; view, S.

T. L. Patterson, F.I.C., F.C.S.

SMALL LANTERNS AND DISSOLVING VIEWS.

[Stereoscopic Club.]

The practicability of reducing the size and diminishing the weight of magic lanterns occupied my attention many years ago. In The British Journal of Photography of May, 1878, I published a description, with illustrations, of two small lanterns which I had constructed. They were very little larger than cigar boxes. The fronts for carrying the objectives were made to disconnect and to pack up inside the bodies when not in use; chimneys were dispensed with in favour of flat tops; they could be used separately as single lanterns, or together side by side or one over the other. The illustrations and descriptions were republished in the *Magic Lantern Manual* of the same year. Thus it will be seen that contracting the size, dispensing with chimneys, and packing the front inside the body, is not the new idea many people suppose it to be. With those little lanterns I have given dozens of successful exhibitions at the Manchester Photographic Society and elsewhere, showing the pictures to twenty feet square.

But for a long time, and down to a few years ago, the biunial lantern —*i.e.*, two lanterns in one body, one over the other—was the prevailing design for so-called high-class lanterns, the object of two lanterns being, as everybody knows, for the production of "dissolving views;" and, in these days of lenses of various foci or long-focus objectives, the biunial lantern has grown into a very heavy, elaborate, and expensive instrument. The triple lantern is a higher development of the biunial, and, by reason of unnecessary elaboration and inconvenience, both triple and biunial lanterns have fallen into disfavour of late years.

There are, however, other uses for a double lantern, or two lanterns, independent of dissolving views, as, for instance, one lantern may be used for the projection of ordinary slides, whilst the other may be employed for the projection of scientific experiments, the lantern microscope, polariscope, &c.

But to return to dissolving views. It has been said that this way of exhibiting improves poor slides, and also helps out a weak lecture, and that it is a very pretty effect; so, if people want dissolving views, they must have them.

What is meant by dissolving views is that one picture fades away, or "dissolves" simultaneously with another picture being made visible—*developing* on the screen.

To produce this effect two lanterns are indispensable; with a single lantern we may have quick-changing carriers, panoramic carriers, or others to produce an out-of-focus effect, or an eclipse, or semi-eclipse, during the change from one picture to the other. But the true dissolving effect is only possible by two lanterns, as has already been said.

Now, it matters not what form these two lanterns take. They may be placed side by side diagonally, as in Dancer's lantern, or one over the other, as a biunial lantern. The idea that a biunial lantern is more conveniently manipulated by one operator may be entirely dispelled. The proper place for a lanternist to stand is at the back of his instrument, and with a properly constructed pair of lanterns everything is within reach, and the opening and closing of side doors and constant adjusting of the objectives for focussing the slides is rendered absolutely unnecessary.

The contrivance for dissolving one picture simultaneously with the developing of the next was originally a "comb" or serrated "fan," worked in front of the objectives by a mechanical arrangement for gradually cutting off the rays from one lantern with the gradual opening of the other lantern.

The late M. Noton, of Manchester, used an iris diaphragm in front of each lens, and by a lever communication one was closed as the other opened. By these arrangements it was necessary to maintain the full light in each lantern during the exhibition.

Mr. Dancer, of Manchester, conceived the idea of turning down the light of one lantern simultaneously with turning it up in the other lantern, and constructed a series of taps actuated by one lever, and immediately after this M. Noton combined the use of these several taps in one plug and body.

Since then the dissolving tap has been slightly modified in design, but it has never been improved; on the contrary, durability and effectiveness have been sacrificed for fine appearances, in some of these fancy-looking taps, six ways are opened and closed in line, on the circumference of a plug three-quarters of an inch in diameter, the object being to get a short plug for compactness, and the very thing that ought not to be. Every mechanic knows that a long plug like a long bearing works better and holds the lubricant. With six ways in so small a circumference there is too little room for tap to keep tight, the slightest dust or grit cuts the plug, and soon it becomes stiff and jambs, or permits the passage of gas from one side to the other, and as a result little explosions, by the mixing of the gas in the tap, are not unfrequent. A well-made dissolving tap ought to be provided with a long plug with the oxygen openings separated from those of the hydrogen by at least an inch in the length of the plug, and between these there ought to be a groove turned in the plug, say one-eighth inch wide and deep, with a hole to correspond in the body of the tap, so that, in case the plug did not fit tight, the gases could not mix, but would escape by the hole in the body; and in this arrangement there are only three openings in the circumference of the plug, therefore more tap and more surface to hold a lubricant. In some of these elaborate-looking taps two bye-passes are provided, one on the oxygen side and another on the coal-gas side; the latter is necessary to maintain a light, but the former serves no purpose whatever, unless it be to increase the expense.

Another method of changing the pictures, and which is a pleasant change from dissolving, is that of one picture rolling up from the bottom displaying another underneath; this is called the roller-curtain effect. In a biunial lantern it is produced by a thin metal shutter passing between the face of the condenser and the picture. The length of this shutter is just in excess of the distance between the optical systems, so that, where the light from one lantern is shut off, the other is open; thus, where the shutter is half way, the sky of the top picture is covered and the sky of the bottom picture is showing on the screen. Of course, where this is used, the light in both lanterns must be at full.

Now it will be seen that when dissolving from one picture to another this curtain shutter must be entirely removed from the lantern, and when we desire to introduce the curtain effect the shutter must be introduced when the top light is turned down; but as soon as the shutter covers the top condenser the light must be turned up, and as the shutter is lowered the picture in the bottom lantern has the appearance of rolling up from the bottom, displaying another under it (shown by the top lantern). At this stage we have the bottom lantern shut off, and the only way to open it is to draw it up again after the picture has been changed. Thus the effect of rolling must always be done *twice* together every time it is used, owing to the fact that the shutter can be removed only from the top.

In a pair of lanterns working side by side a similar effect can be produced; but, instead of rolling up and down, the pictures are introduced sideways, and have the appearance of an unfurling panorama; and, as the shutter may be introduced or withdrawn from either side, the effect may be produced at any time, and for once only and done with, as, for instance, when we wish to skip from one subject to another, or from one part of the country to another.

But the finest effects in changing may be described as a cross between dissolving and the roller curtain. This method was adopted by Mr. Kirnon, the skilful operator to Mr. Rajan, the American lecturer, who visited this country in the early part of the present year.

In the Great Free Trade Hall, Manchester, these lectures had a run of some weeks, and, so far as lantern manipulation, I have never seen that excelled if ever equalled. The screen was thirty-six feet square, and the pictures shown to thirty-three feet square, brilliantly illuminated by limelight.

As seen by the audience, whilst one picture was on the screen another began gradually to develop, and when this was full out the departing picture was not dissolved in the usual way, but, as a friend of mine expressed, it seemed to "fly away," or to be "blown away." Sometimes its departure commenced from the bottom and finished at the top, sometimes it flew away from one corner and then from another, and in a variety of ways it mysteriously vanished; at other times they were quietly and steadily dissolved to the end, and at other times by an instantaneous flash from one to another.

By the kindness of Mr. Rajan and his clever operator I was permitted to see the whole manipulation of these effects.

Two lanterns were used placed side by side, the space between the condenser and the objectives was entirely open, whilst a picture from No. 1 lantern was showing the dissolving tap was turned until the next picture was fully developed; then by a gentle sweep an ordinary lens cap was applied to the back of the objective of No. 1 lantern, and, depending upon the way in which this cap was applied first from one side and then the other, so the picture vanished; the dissolving tap was then turned farther to shut off the light of No. 1 lantern, a new slide introduced, and so the whole goes on with variations at the discretion of the operator.

Now, it will be seen that capping the lens from the back of the objective is very different to the rapid or abrupt cut off by capping in front of the objective. I shall now have pleasure in exhibiting a few effective changes such as I have described.

W. I. Chadwick.

LIGHT IN DARKNESS: INTRODUCING THE STUDY OF PHOTOGRAPHIC METASTASIS.

In 1886, I think, certainly not later, for my own satisfaction, and in order to make sure of my ground in the future, I verified the accuracy of Professor Janssen's sequence of the phases of negative half-tone, positive half-tone, and negative "images" of the sun. Early in the year 1887 I set myself to discover the relation between the times required (= exposures) and the phases produced (= densities 0 (+1), 0·5 (+0·5), 1 (+0), 0·5 (+0·5) and 0 (+1)).

In this I succeeded, but only after making a vast number of experiments, and on January 13, and again on November 16, 1888, in THE BRITISH JOURNAL OF PHOTOGRAPHY, I published, in addition to my general deductions, a typical series of figures (*ex grege gregum*) showing the connexion between the period employed and the phase produced that is between exposure and density. The substance of this article was translated into more than one foreign photographic periodical, and the *Journal of the Photographic Society of India*, in a historical review of the progress of research on solarisation, took special notice of my labours in this field. Later (after May, 1890), I was now and again surprised at coming across, in the *Amateur Photographer* and elsewhere, what I took to be laudatory commentaries, explanatory extensions, and mathematical dissertations on my work. A closer perusal of the articles, however, showed me that while really dealing with my law, they referred to solely the supposed discoveries of investigators other than myself.

Now, although experienced photographers are well acquainted with the more salient characteristics of halation and solarisation, yet are there very few indeed, professional or amateur, who are familiar with the momentary changing details which mark the stages by which, under varied, but for the time being constant, conditions, a negative passes first into a neutral (= no "image" at all), then into a positive, after that into a neutral again, and then once more into a negative. Fewer, still fewer, are they who have timed by the second many thousand prolonged exposures, and photometrically measured the various densities produced in a number of chips of the same plate simultaneously developed by an equal immersion in the same chemical solution.

It is not, then, difficult to see that those who do not read much, or who ignore voluntarily or involuntarily what they have read, form, when they come in contact with a few specimens of halation or solarisation, whether by accident or design, very crude and frequently erroneous impressions.

It is by no means my intention, however, to combat any impression on this subject, either hastily or laboriously deduced, but simply to describe some of the less-known appearances presented by developing plates submitted to different sources of illumination and under various forms of image or screen when abnormally exposed; to expand my original discoveries; and lay special stress upon one or two important facts, which, if observed, have hitherto escaped comment, to suggest a working hypothesis by which much that has remained obscure even to this day may ultimately be theoretically made clear.

HALATION AND SOLARISATION IN GENERAL.

As the present article is primarily put forward for the consideration of experts, it is unnecessary to define either the fuzzy darkening known by the name of "halation," or the clearing of what would naturally be expected to be always the densest portion of the image, to indicate which the terms "solarisation" and "reversal" have in turn been assigned. At the same time, as the ground has been but little trodden, it may be as well to try to guard against obscurity or liability to misapprehension by a preliminary recapitulation of the circumstances under which the salient and best-known features occur before touching upon the modified conditions which render certain details prominently manifest, details probably always present.

In this attempt I will begin with one of the first stages of solarisation, although not yet recognised as such, viz., "halation."

As every one knows, then, halation is most commonly noticed when photographing great or abrupt contrasts of light and shade, and it is habitually assumed that, when present, part of the subject has been "over-exposed," or, which comes to the same thing, disproportionately developed. Figures and groups, in which white and black fabrics are brought together, machinery with strong reflected lights, windows and skies, ere solarisation proper is recognisable, afford the most familiar examples of this "pest," as the practical man calls it. For reasons which will shortly appear, we will not consider self-luminous bodies at present.

Now, generally speaking, halation ordinarily takes the form of a softly fading dark halo surrounding the whole, or extending along one or more of the edges of the image of the brightest part of a natural contrast or series of contrasts. This halo is, as I have just said, dense, but in every-day work is invariably, or almost invariably, less dense than the portion of the image with which its darkest "edge" is in contact. It is in this respect, or in this aspect, more particularly that it has been considered by those who have attempted to trace the course of the effect, propound a theoretical explanation, or propose a cure. To the best of my knowledge, only two causes have as yet been advanced. One of these—to wit, reflection from the back surface of the glass support—is that which most obtains: and, while I grant that this is frequently a potent factor, I hold that it is an insufficient explanation in so far as halation, and even reversal, occurs in films exposed and developed on white and even red paper. The other hypothesis—offered first, I believe, by Captain Abney—is that the effect is due to the scattering of the light by reflection from the individual agglomerated particles of silver haloid constituting, together with the suspending vehicle, a translucent film. I devised and carried out, however, an experiment which proves that this action, if existing at all, has an almost imperceptible effect.

Beyond these two formulated hypotheses regarding the nature of halation I known of none. It is true, however, that the trained scientist who dabbles more or less in photography talks equally learnedly and vaguely of "a molecular action which precedes the chemical one," and I for long held—and I am not sure that I do not still hold—that the alternate power to attract and repel the metal supplied from the solution of silver salt thrown down by the depositor was due to an electrical action and to a form of electrical polarisation. Suffice it to say here, however, that as yet halation has been treated as something distinct from solarisation.

Solarisation is still more seldom encountered, still less understood, if that is possible, than halation. I have read, here and there, at rare intervals, summaries of all we are supposed to know about it, and for all the information imparted, either historically or scientifically, they might as well have never been written.

In 1839 Fyfe, Lassaigne, Talbot, Herschel, and Hunt observed, in the words of the last named, "a singular property in the hydriodate of postash of again whitening the paper darkened by exposure, and also that the bleaching process was very much accelerated by the action of light." . . . . "The most extraordinary character of the hydriodic salts is, that a very slight difference in the strength of the solutions, in the composition of the photographic paper, or in the character of the incident light, produces totally opposite effects; in the one case the paper is rapidly whitened, in the other a deep blackness is produced almost as rapidly. Sometimes these opposing actions are in equilibrium, and then the paper continues for a long time perfectly insensible."

Now, although this property forms the basis of the production of positive images in silver-salt photography, it has only an indirect bearing on solarisation, although, much later, Abney employed the same principle, namely, that of dosing a darkened silver salt, insolating it, and obtaining a positive by this means, argued therefrom as to the nature of true solarisation proper.

Although the term solarisation was at first simply confined to actions analogous to the partial *darkening* of skies in Daguerreotype landscape, and in no wise implied complete reversal, yet one of a series of experiments, made by Shaw and Percy with the object of seeing whether the sensitiveness of an exposed Daguerreotype was restored by the action of mixed vapours of iodine and bromine, abundantly proves that complete reversal was obtainable by the development with mercurial vapour under circumstances entirely in accord with the phenomena of to-day, in which the period of exposure is only variable. I copy the paragraph *in extenso* from Hunt's *Photography*, second edition, pp. 194, 195.

"A prepared plate was exposed to light and afterwards to the mixed vapour; mercurial vapour was found to have no effect upon it; the plate was then partly covered with a metallic screen, fixed close to, but not in contact with it, and the whole was exposed to light. On placing the plate in the mercury box, a broad white band, nearly corresponding to the edge of the defended part, made its appearance; the whole of the defended part (excepting the band in question) was unaffected, and the exposed part exhibited very little change. By a careful examination of the plate after it was removed from the mercury box, the white band in the middle appeared to be produced by the feeble light which had passed under the edge of the metal plate which had screened the light from part of the prepared surface; *and the very dark, and apparently unaltered appearance of the exposed part, was occasioned by an excess of action, for mercury was found to have condensed on that part in large quantities, and to have produced the dark lead colour which is commonly called solarisation; but which effect, in the case in question, was so excessive, that the colour of the part on which mercury had condensed differed but very slightly from that on which no light had fallen.* It was now evident that *the apparent absence of effect* in the last experiment *was in reality* occasioned by *an excess of action;* and by repeating that experiment and making the time of the second exposure to light much shorter than before, the plate

assumed, under the action of mercury, an intense and beautiful whiteness." [The italics here are mine.]

For the next fifteen years the subject seems to have attracted but little attention, but 1855–6–7–8 were fertile in observations on the "Alternating Action of Light" (Hardwich, *Journal of Photographic Society*, vol. ii. p. 211); the "Reversed Action of Light" (Jackson, *Ibid.*, vol. iv. p. 76); the "Reversed Action of Light" (Hardwich, *Ibid.*, p. 82); "Reversed Action of Light" (Craddock, *Ibid.*, p. 144); "Reversed Action of Light" (——— *Photographic Notes*, vol. iii. p. 92); after which, to leave my note-book and quote from memory, the papers of outstanding importance have been, first, that of Prof. Janssen, who, as I have already more than once stated, was the first to give the true order in which the phases followed each other, and who was also the first to establish the fact, that in addition to the neutrals other phases occurred and recurred; and second, that published by myself in 1888, in which, after showing in the first, second, and third paragraphs that the superficial degradation first formed by light, either on ordinary silver paper or on a gelatine dry-plate, forms an obstacle to the penetration of the light which falls upon the film afterwards, a degradation palpable after fixing; in paragraph D. I said: "If the normal be produced with an exposure x, and the first neutral (invisible) with an exposure nx, then the first reversal will be obtained with an exposure n^2x, the second neutral with an exposure n^3x, the second normal with an exposure n^4x, and, presumably, so on, *e.g.*:—

Normal	5 seconds
Neutral	90 „
Reversal	1,620 „
Second Neutral	29,100 „
Second Normal	524,880 „

which is, *I think*, equivalent to stating—

That the numerical expression of the given density (1·0,0·5,0·0,0·5, 1·0) corresponds *in a certain manner* to the number expressing the exposure.

This, *I again think*, is equivalent to saying that "the logarithm of a number is the index or exponent of the power, to which a given constant base or root must be involved, to be equal to that number."

And either expression of my law, *I again venture to think*, is precisely the same thing as saying that "the densities are proportional to the logarithms of the exposures." This last quotation is taken from Messrs. Hurter & Driffield's paper, published in the *Journal of Chemical Industry*, May 20, 1890.

I would here remark that, as I acknowledged at the time, the numbers I employed to express the exposures corresponding to the given densities dependant upon them were not directly found by experiment, but were deduced from a mass of more or less conflicting testimony.

My figures were, I acknowledge, deduced, not found for me, mechanically by a machine, and were given by myself purely and simply to convey my impression as to what the *exact* relationship between time of exposure and density of deposit should be, bearing in mind, as I pointed out, that there was always a slight excess of density or decrease of attractive or repulsive power as estimated by the exposure, due to the printed-out degradation of the film, for which allowance had always to be made.

While this determination of the sequence, and the periodicity of the sequence, must of necessity be put prominently forward as of special practical or theoretical value, it must not be forgotten that much more light was cast upon this obscure question, among which may be cited as pre-eminent Abney's previous approximation to the sequence, his experiments—aiming, however, at an explanation of the phenomena of halation, defined as distinct from solarisation—with apertures of different shapes, his experiments on and the evidence led by the spectroscope as to the refrangibility of the rays producing reversal.

Neither must I omit my own independent experiments verifying or denying the truth of Captain Abney's conclusions, nor those in which I demonstrated that *thio*-sulphate of sodium added in excess to a ferrous oxalate developer produced reversals with normal or under exposures. Colonel Waterhouse's discovery that *thio*-sinnamine tended to produce reversals with exposures of similar duration, and his far more crucial researches on the evidence, led by the galvanometer on reversed electro-magnetic currents, induced by reversing exposures, must not be forgotten.

This latter form of experiment, I may say, I have over and over again repeated, and have invariably confirmed the reliability of Colonel Waterhouse's results. At the same time, I confess that my researches in this direction have been only partially published, and that my results remain unclassified. HUGH BRENNER.

ON THE METHOD OF EXAMINATION OF PHOTOGRAPHIC LENSES AT THE KEW OBSERVATORY.*

In considering and in recording the results of examinations, it has been found convenient to give more exact meanings to certain expressions than have as yet been assigned to them. The following definitions have therefore been adopted at Kew:—

A narrow-angle lens means one covering effectively not more than 35°.

A medium-angle lens means one covering between 35° and 55°.

A wide-angle lens means one covering between 55° and 75°.

An extra wide-angle lens means one covering more than 75°.

With regard to the wording of the "General Remarks" in the certificate, it should be remembered that the lens is judged entirely with reference to a plate of named sized; the lens is therefore classed as above by the angle of field which is given as the last item but one in test No. 10. If the same lens is examined for plates of different sizes, the certificates would be worded differently in each case.

The C.I. No. of a stop means the number which indicates the intensity of illumination produced by it on the plate according to the system proposed at the International Photographic Congress of 1889

The *largest normal stop* means the largest stop that can be used with the lens so as to produce definition up to a selected standard of excellence all over a plate of given size, the objects whose images are seen being all equally distant.

A slow lens means one of which the largest normal stop has a less diameter than has C.I. No. 6.

A moderately rapid lens is one of which the largest normal stop is C.I No. 6, or larger than that size and less than C.I. No. 2.

A rapid lens is one of which the largest normal stop is C.I. No. 2, or larger than that size and less than C.I. 2/3.

An extra rapid lens is one of which the largest normal stop is C.I. No. 2/3, or larger than that size.

For convenience of reference, these definitions will in future accompany the certificate, probably in the form of additional notes.

No doubt most lenses are supplied with stops larger than the ones here called the largest normal stops, even if it is not intended to use smaller plates than those under consideration; this is, of course, very right, for in many cases the photographer will be willing to sacrifice the definition near the edge of the plate for the sake of increased rapidity.

It now remains to be shown in what way the above certificate of examination would be useful to the practical photographer, who has sent his lens to Kew for the purpose of being tested. It may, we think, be assumed that he wants answers to the three following questions:—1st, Is the lens a good one? 2ndly, Does it properly cover the plate of the named size? And 3rdly, What exposure must be given when using the different stops.

With regard to the two first questions, the result of the examination is recorded in such a way that he may either rely on the "General Remarks," or he may form an independent judgment from the results of the tests.

In order to decide himself, from the records in the certificate, whether the lens is, generally speaking, a good one, he should first look to test No. 13 to see if the definition in the centre of the plate with the largest stop is "excellent," as should always be the case; he should then consider test No. 15, by which he will see what are the faults introduced by the lens not being properly corrected for chromatic aberration. With regard to the second question—that is to say, when considering whether the plate he intends to use is properly covered or not, he should chiefly look to the results recorded under test No. 13, where is given the size of stop or the rapidity of the lens for a given standard of definition up to the edge of the plate. If the definition at the centre is "excellent," then any want of definition at the margin will be chiefly due to curvature of the focal surface or to astigmatism, and therefore the results of tests Nos. 12 and 16 should be considered at the same time as test No. 13. He must also look carefully to the result of test No. 14, which shows the maximum distortion produced in the image. It will depend for what class of work the lens is to be used whether he should consider the amount of curvature in the image of a straight line near the edge of the plate, which will be there indicated, is objectionable or not.

The "General Remarks" are recorded as the result of exactly similar considerations to those discussed above, the experience gained by the examination of lenses of undoubted quality giving an idea of what standard of excellence should be required.

With regard to the third question, as to the exposure to be given with the different stops, it may be hoped before long that the C.I. numbering will be generally adopted by all practical photographers, in which case the results of test No. 9 will give the information required.

* Continued from page 697.

In many works on photography, the view is expressed that the practical photographer also wishes to know from what point on his lens he should measure or adjust the distance of any object so that, by reference to tables, he can obtain definite enlargements or reductions; this is, in fact, urging that the position of the principal planes should be marked on the mounting of all lenses. According to our experience, this is a want in reality very seldom felt in practice. The tables are, no doubt, sometimes used to get approximate results, the fine adjustment of scale being afterwards done by measurements on the ground glass; but if the slot between the two lenses of a doublet is used as the point from which the measurements of distance are made, the results will be quite near enough to the truth to serve as a first adjustment, and for this purpose nothing will be gained by marking the exact position of the principal planes; it should, however, be stated that the omission to mark them is merely made in consequence of the necessity felt of minimising, in every possible direction, the time spent in the examination.

Each test to which the lens is subjected will now be described in detail, together with such discussion as to the reason for its adoption as may appear necessary.

The first four headings of the certificate deal with the numbering of the lens, the maker's name, the size of plate for which the lens is to be examined, &c., and as these do not form part of the results of the examination, no remarks are necessary with regard to them.

5. Number of Reflecting Surfaces.

In most cases the number of reflecting surfaces of glass is known at once from the type of lens, but, if in doubt, a simple experiment will settle the point; the room is darkened, and the reflection of a lamp is observed in the lenses; each of the surfaces of the lenses will give one direct reflected image, and the number can thus easily be counted. The amount of light which reaches the photographic plate decreases with an increased number of lenses, because of this reflection, and this circumstance should not be forgotten in estimating the suitability of a lens for any special purpose. Surfaces merely separated by Canada balsam reflect little light, and need not be considered from this point of view.

6. Centering in Mount.

Two different errors might be described under this heading: either (1) the optical axis of a perfect lens may not coincide with the axis of the mounting, or (2) the axes of the different lenses of a doublet or triplet may not all be in the same straight line. As to the first of these errors, we believe it would never be sufficient to have any appreciable effect on the practical value of a lens, and therefore no test for it is considered necessary. With regard to the second error, Wollaston's test is the only one applied; this consists of looking at the flame of a lamp or candle *through* a compound lens, and noting if all the different images of the light as seen by successive reflections from the surfaces of the glass can be brought into line by a suitable movement of the whole lens, which should be the case if the component lenses are arranged about a common axis.

It may be remarked that the nodal points may be shifted away from the mechanical axis of the lens in consequence of either of the above-mentioned errors, and also, on the other hand, that the second error may exist—that the axes of the component lenses of a doublet may not be coincident—and yet one or both of the nodal points may conceivably be found on the mechanical axis of the mounting; it follows, therefore, that to estimate the distance between the nodal points and the mechanical axis, which has been suggested as a means of detecting any want of centering, does not answer that purpose very well.

7. Visible Defects, such as Striæ, Veins, Feathers, &c.

Under this heading any faults detected by a careful inspection are given.

LEONARD DARWIN, Major R.E.

[To be continued.]

A PHOTOGRAPHIC GUIDE BOOK.

A RECENT journey amongst a few of the central Italian cities has given me some experiences which I feel disposed to turn to the profit of the craft, professional or amateur, and the practical nursing of which to maturity I would recommend to the Camera Club, which has the best appliances for its actuation. It is the editing of a guide to photographers who wish to profit by the short and sometimes hurried visits they may make to the picturesque cities all over the world. There will always be a great pleasure in the hunting out picturesque bits for the sake merely of their picturesqueness, and the taste of men, and women, will differ as to point of view and attractiveness of subject, but there are certain points on which the agreement will practically be complete. These are on the value of historical monuments, celebrated buildings and localities, &c., &c., and these are in most cases to be best seen under aspects which do not depend so much on the taste of the photographer as on the points of the compass.

My plan is this, Let every tourist-photographer who has made a stay in any attractive city, likely to be much visited by his *confrères* make a careful and exhaustive study of the monuments and subjects in it, and note the point of view and hour of the day which show them to the best advantage, if possible to be accompanied by a small map of the city with the monuments indicated, the hour of the day at which the light gives it the best effect, and shows best the character of the architecture. Let the Camera Club appoint an editing committee whose business it shall be to collect and examine these reports and amending one by another if feasible, make a thoroughly practical guide to the tourist which shall save him the trouble of examining the cities included at all times of the day and at more or less varied seasons of the year, and in case of hurried and necessarily limited visits, enable him to use his time with the greatest economy. Like Baedeker or Murray, this should be overhauled and added to as occasion offers and contributions permit, from time to time, and new editions issued as may be needed.

I offer an example, not as a specimen of what the plan ought to be so much as to show the direction of the instructions, because the city which I use as illustration is one I have not been long enough in to do all that it needed, neither having been in it at the best season. In fact, I was too late in the year to get some of the most important monuments, and these I indicate by general knowledge of what the situation demands. It is a sketch of a section of the book.

PERUGIA.

On the railway between Florence and Rome *viâ* Terontola. Hotels recommended, Grande Bretagne, Albergo di Belle Arti, Grand Hotel di Perouse, dearer and much resorted to by season visitors. Objects of photographic interest: The great gate, locally known as the Etruscan gate, one of the ancient gates of the city, and the only one in a state approaching that of the Etruscan epoch. It is only to be taken with any effect of sunlight in the early morning of the long days of June and July, as it faces the north and the surrounding buildings interfere with the morning light. In the month of September the light only falls on it from 7 a.m. to 7.30, but too red to give any effect of light and shade even with orthochromatic plates. Palazzo Communale, the ancient town-hall on the principal square of the city; two views, one from the north-east, only to be got in the morning light and not later than August, when it is available about 7–8 a.m., and the other of the principal façade on the main street of the city, comes into the best light about 10–12 a.m. The fountain of Fra Benvegnati in the main square is best at about 2 p.m. The Church of St. Angelo (an ancient temple turned into a church) is most available at 8-10 at any season, and the gate of St. Angelo, close by, a fine example of the military architecture of the 12th-13th centuries, is to be taken in the afternoon of any month, 3 to 4. The church of St. Bernardino, one of the most important works of Agostino di Duccio, should be taken in the hours between 10 a.m. and noon. There is a most interesting view of a part of the city to be taken from the viaduct which crosses the valley between the University and St. Agostino, looking toward the south-west, with the ancient gate of the city (restored in the middle ages and with a Gothic arch) up a long flight of steps; at the right is seen a long piece of the Etruscan walls of the city. The Porta Eburnea offers a picturesque as well as archæological interesting subject in the morning, about ten o'clock, from the street below the terrace in front of the Grand Hotel di Perouse. The Porta Marcia, a gate removed from its ancient position by San Gallo to make room for the citadel (now demolished) comes into light in the afternoon, 2 to 4.

To the east of the city, from various points beyond the walls there is an interesting view of the great plain of the upper Tiber with Assisi in the distance, to be taken in the late afternoon of very clear days. The upper Tiber presents some most picturesque points lower down, in the vicinity of the first station towards Assisi, Ponte S. Giovanni and from the villages of Ceppi, Bicocca, Fratta, &c., and a beautiful view of the valley of the Tiber is seen from Sta. Petronilla, two miles beyond Perugia on the road to Umbertide.

This is not intended to exhaust the example I have taken, as there are many things of interest to the photographer in Perugia, but it will serve to illustrate my idea. With such a guide in hand the tourist goes at once to the points which he may be most interested in, at the proper hours of the day, and studies his point of view and effect to suit his own taste. He knows when the sun illuminates the subject he wants, and, if by chance he has but limited time to give to the place,

he makes the most of it. In short, it would do for him what Baedeker does for the hurried tourist, saves him the trouble of exploring the locality without a previous idea of what he may find of interest, and, if he must hurry, enables him to do so with the least loss of his opportunities.

W. J. STILLMAN.

Rome, October 27, 1892.

Our Editorial Table.

VARIOUS PRINTING PAPERS.

MR. OTTO SCHÖLZIG, 31, Binfield-road, S.W., sends samples of a new paper he is about to bring into the market under the name of Schölzig's enamel paper. It is a salted, hardened, gelatinised paper, to be sensitised by the photographer himself, and toned and fixed in the usual manner. The sheet is 20×24 inches. The samples sent are tinted, one sheet a mauve and the other rose, both very delicate.

A SPECIMEN of double albumenised, sensitised paper, received from Mr. W. Webber, Bristol, printed with a fair degree of rapidity, and took a good tone in the acetate toning bath.

CELLOIDIN paper, a Continental production, has been introduced into this country by Messrs. A. & M. Zimmerman, Cross-lane, St. Mary-at-Hill, E.C. The printing process is the same as that for albumenised paper. The toning and fixing are recommended to proceed simultaneously, a formula for the combined bath being given.

HARTLEY'S CELLULOID DEAD BLACK.

THE Anglo-American Varnish Company, Birmingham, has submitted a sample of the above black varnish, which may be applied cold to wood, leather, or metal. It dries dead, and adheres well.

METAL LANTERN-SLIDE BINDING STRIPS.

WE have received from the Photographic Enterprise Company, Birmingham, specimens of their "Enterprise" lantern-slide binding strips. They consist of a strip of tin, having the edges turned over, and capable of bending and holding together the slide, the matt, and the covering glass. They will be useful in the extemporising of mounts.

NOXINOL AND THIOTONE.

THESE preparations are introduced by G. Wright & Co., Hopwood, Lancashire. By the addition of a little of the former to the developing solution, it assumes a non-actinic colour of such a quality as to prevent freedom from such fogging as might result from developing plates in tents, or other places where it is possible there may be such a degree of light as would cause fog. Thiotone (for which a patent has been applied) is a toning solution for producing rich, warm tones on gelatino-chloride printing-out papers.

THE POLYTECHNIC INSTITUTION.—The following lectures commence on November 8:—*Art in Relation to Photography, with Examples.* Six weeks' course. Mr. Valentine Blanchard. *Technique and Practice of Studio, Landscape, and Architectural Photography, with Examples and Demonstrations.* Six months' course. Mr. Howard Farmer. *Science and Technique of Photography* (City Guild's programme). Mr. A. W. Dollond. The Practical Classes commence on November 8, and comprise Studio Posing and Lighting, Studio Posing and Lighting (Electric Light), Finishing Enlargements in Black and White, Wet Collodion (for Photo-Mechanical Processes, Copying, &c.), Photo-Gravure, Enlarging, Lantern Slides and Lantern Work, Collotype, Silver, Carbon and Platinotype Printing, Retouching, Photo-Lithography and Zinc Process Work. Prospectus and syllabus of either of above classes on application to Mr. Robert Mitchell, Secretary, at the Institution, 307, Regent-street. The programme, it will be seen, traverses practically the whole field of photography, and to any one in search of instruction provides all the opportunities needed. The Polytechnic has been so far very successful in teaching photography, and doubtless will continue so.

THE Photographic Society of Great Britain had 1213 visitors to the Exhibition last week, making a total of 7490 since it opened to the public. The Lantern Evenings especially have increased in popularity this year, and, with the single exception of the Inaugural Exhibition, up to the present this year's heads the list.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 19,237.—"An Improved Photographic Stand, which may also be used as a Lady's Companion." W. B. GRIFFITHS and J. WOODLEY.—*Dated October* 26, 1892.

No. 19,251.—"Improvements in and in connexion with Photographic Cameras." E. H. MICKLEWOOD.—*Dated October* 26, 1892.

PATENTS COMPLETED.

IMPROVEMENTS IN CLAMPS OR CLIPS FOR USE IN PHOTOGRAPHIC COPYING PROCESSES.

(A Communication by Alois Delng, Munich, Bavaria.)

No. 865. WILLIAM PHILLIPS THOMPSON, F.C.S., M.I.M.E., 6, Lord-street, Liverpool, and 6, Bank-street, Manchester, Lancashire, and 323, High Holborn, Middlesex.—*October* 8, 1892.

THE clamps or clips employed in copying processes in photography have the drawback of hindering the passage of the light at the points where they grip or touch the plate to which they are applied. The consequences resulting therefrom have been long known to every practical man.

This invention has for its object to provide a clamp or clip which, when used in photographic copying processes, will produce as little injurious a shadow as possible. This is attained by constructing the upper arm of the clamp or clip in a peculiar manner, and more particularly by causing the same to come in contact with the plate at one point only.

The invention may be carried ont in various ways. For instance, the clamp or clip may consist of a stirrup springing outwards, which is formed either of a sheet spring or a wire. The lower jaw of the clamp or clip is attached to the upper arm of the stirrup, and is bent off at right angles downwards, whilst the upper jaw is attached to the lower arm of the stirrup, and is bent upwards. The upper jaw is, as already previously mentioned, constructed in such a way that it stands as little as possible in the way of the action of the light, and only grips the plate above at one point. It is, therefore, preferably constructed of wire, which stands vertically on the plate, bends round further above, and extends downwards, where it is attached to the lower arm of the stirrup. The lower jaw may have a correspondingly broader surface, or may come in contact with the under part of the plate at only two points. The stirrup with its two arms may be constructed ont of one piece of wire, on which suitable finger plates, for convenience of handling the clamp or clip, are soldered or otherwise suitably fastened.

In another pattern of clamp or clip two plates may be connected by a spiral spring, and acting with a spring pressure against each other, something after the fashion of a clothes peg, the upper one of which receives the clamp or clip jaw, hereinbefore described.

As this latter stands as upright as possible on the plate, and only bends further upwards, it becomes possible that the rays of light will fall during the entire duration of the exposure on all points of the plate with the exception of the points of contact of the upper clamp jaw.

APPARATUS FOR DEVELOPING, FIXING, AND WASHING PHOTOGRAPHS.

No. 19,471. JULIUS WAGNER and GEORGE BIEDIG, both of Zeitzerstrasse, 27, Leipzig, German Empire.—*October* 8, 1892.

OUR invention has for its object to provide a box or tray which serves not only to receive the developing or fixing liquid, but which is constructed in such a manner that the negative may be securely held in the box and easily examined or observed from both sides, without pouring out the liquid and without admitting the full daylight.

For this purpose we form the developing box of two principal parts, namely the lower part, serving to receive the developing liquid, and the upper part, serving to receive the negative, the two parts being separated from each other by a grate or other suitable means, and the whole having preferably the shape of a shallow rectangular trough or box placed upright, that is, on one of its narrow sides, and closed on all sides except at the top, which is provided with a hermetically closing cover.

The front and back of the upper part of the box are made of red glass or provided with red glass windows, through which the negative can be observed when it is not surrounded by the developing liquid. The liquid is admitted through a funnel placed at the top of the box and communicating with the lower part of the box through a vertical pipe situated along one of its narrow sides. A draw-off cock and short pipe placed at the bottom of the box serve to discharge the spent liquid.

To develop a negative by means of this apparatus, we proceed as follows:—

After removal of the cover, the negative is introduced into the box so that it rests with the lower edge upon the grate mentioned above, while the top is held by the cover (which is now closed) and a narrow guide slot.

The developing liquid is now poured into the funnel, the feed-pipe leading down from the funnel is closed by a stopcock, and the liquid is brought in contact with the negative by holding the box upside down, horizontally or in any other suitable position. In order to observe how far the image has been developed, the box is placed upright, so that the liquid runs into the lower part, while the negative remains in the upper part, so that it can be easily examined through the windows.

To many of those who are conversant with the early annals of gelatine dry plates, it will be interesting to know that Mr. Peter Mandsley is to revisit this country early in November. He has long been resident in Rochester, New York, and has not been making dry plates for several years, although, as a landscape and general photographer, he has been a user of them.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
November 7.....	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 7.....	Halifax Camera Club.....	
,, 7.....	Peterborough	Museum, Minster Precincts.
,, 7.....	Richmond	Greyhound Hotel, Richmond.
,, 7.....	South London	Hanover Hall, Hanover-park, S.E.
,, 7.....	Stereoscopic Club	Brooklands Hotel, Brooklands.
,, 8.....	Derby	Smith's Restaurant, Victoria-st.
,, 8.....	Great Britain	50, Great Russell-st. Bloomsbury.
,, 8.....	Manchester Amateur	Lecture Hall, Athenæum.
,, 8.....	Newcastle-on-Tyne & N.Counties	Mosley-st. Café, Newcastle-on-Tyne.
,, 8.....	Paisley	Committee Rm., Free Lib. & Museum
,, 8	Stockton	Masonic Court, High-street.
,, 9.....	Ipswich	Art Gallery, Ipswich.
,, 9.....	Leicester and Leicestershire ..	Mayor's Parlour, Old Town Hall.
,, 9.....	Munster	School of Art, Nelson-place, Cork.
,, 9.....	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 9.....	Putney	High-street, Putney.
,, 9.....	Reading	
,, 9.....	Stockport	Mechanics' Institute, Stockport.
,, 10.....	Birkenhead Photo. Asso. (An.).	Association Rooms, Price-street.
,, 10.....	Birmingham	Lecture Room, Midland Institute.
,, 10.....	Bradford Photo. Society	50, Godwin-street, Bradford.
,, 10.....	Camera Club	Charing-cross-road, W.C.
,, 10.....	Cheltenham	
,, 10.....	Hackney	206, Mare-street, Hackney.
,, 10.....	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 10.....	Manchester Photo. Society	36, George-street, Manchester.
,, 10.....	North Kent	Gravesend.
,, 10.....	Oldham	The Lyceum, Union-st., Oldham.
,, 11.....	Cardiff (Annual)	
,, 11.....	Holborn	
,, 11.....	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 11.....	Maidstone	"The Palace," Maidstone.
,, 11.....	West London.....	Chiswick School of Art, Chiswick.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 27, Mr. R. Beckett in the chair.—Messrs. R. Bartlett and H. Bremner were elected members of the Association.

QUESTIONS.

The following question from the box was read: "A lantern is fitted with twelve-inch Petzval objective and four and a quarter inch condensers, meniscus (near the light), and plano-convex. A flat field cannot be obtained. Either there is a ragged edge on the disc, or a dark ring round the centre. Making the meniscus more concave has been tried, but does not improve it to an appreciable extent. What is the remedy?"

It was suggested that the condenser was unsuitable, and that another had better be obtained. No other "remedy" was given.

Question No. 2 inquired for a means of getting rid of the yellow stain remaining on gelatino-chloride paper after the combined toning and fixing bath and alum solution had been used, and was deferred to another meeting.

TEMPERATURE AND DEVELOPMENT.

Mr. A. COWAN stated that, the rapidity of a certain plate having been called into question, he had exposed two pieces of one of the plates side by side behind a series of tints, and had developed them in the same solution, but at different temperatures—58° in one case, 70° in the other. The former then only appeared to be a fifth or sixth of the rapidity it ought to be, development occupying exactly the same time in both cases. Three pieces had also been identically exposed and developed, one for ten minutes at 58°, one for two and a half minutes at the same temperature, and one for two and a half minutes at 70°. The first and third were practically identical in regard to the number of tints brought out. Mr. Cowan had confirmed the effects of temperature on development by exposing several plates and developing the first one, which had the appearance of being under-exposed. Upon testing the water, he found it to be 54°; on warming it up to the proper temperature—70° (which, he said, was conveniently obtained in either summer or winter)—the remaining three plates came up all right.

DO PLATES LOSE SENSITIVENESS IN VOLCANIC REGIONS?

Mr. J. WEIR BROWN presented a communication from a friend who had been travelling in Costa Rica. At an altitude of 4000 feet above the sea level he had used films of 18° and 24° (Warnerke) sensitiveness respectively, in a good light at *f*-11, with an instantaneous exposure, found that he was under-exposing. A professional photographer there told him that he had to give longer exposures after plates had been in the country three weeks, which he attributed to the sulphur in the air, sufficient of this being present to at times blacken plates. Mr. WEIR BROWN quoted Mr. Howard Farmer's experience in Egypt (as given at a previous meeting of the Association) of having found his pictures under-exposed in the shadows, notwithstanding the bright light. It had also been suggested that, at a high altitude, a pure blue sky was non-actinic.

Mr. T. BOLAS observed that the presence of carbon dioxide would weaken the actinic power of the light.

Mr. W. E. DEBENHAM thought the particulars given might be the result of "mistaken observation."

Mr. A. HADDON said the matter could be tested in the laboratory, a film being exposed to the action of sulphuretted hydrogen, and then developed side by side with one that had not been treated with H_2S. He thought iridescence due to sulphur in the air.

The CHAIRMAN said iridescence on the negative could be removed by means of a tuft of cotton-wool and a little methylated spirit.

A passage from a work by the late Robert Hunt having been quoted at a previous meeting to the effect that, in the presence of a relatively large amount of red light, a small amount of white light was inactive on a sensitive surface, the following experiment was undertaken:—A sensitive plate, secured to the blackboard, was, in darkness, subjected to the action of three kinds of dark-room glass—red, deep orange, and ordinary ruby—projected from the upper lantern of a biunial, the white light, cut down by means of a diaphragm, proceeding from the lower lantern. Three different exposures were made, and on development it was found that the first plate was much over-exposed, but in the other two it was seen by the developed images that in no case did either of the varieties of the "red lights" diminish the effect of the white on the plate.

After further discussion the meeting closed.

Hackney Photographic Society.—October 25, Mr. F. Houghton presiding.—Mr. GOSLING asked for experience of gelatino-chloride paper. The CHAIRMAN was rather in favour of over-printing and long toning. Mr. BECKETT said plenty of gold should be used. A discussion then ensued on the new platinum paper. Mr. GRANT found it required more printing than the hot bath. Mr. GOSLING asked for a better mountant than starch for printing out paper prints. Mr. BARKER advised Houghton's "Excelsior," as being always ready for use. Mr. R. BECKETT then proceeded to give a demonstration on flashlight photography. He did not recommend such explosives as chlorate potash, as it was apt to cause the sitter to start. Portraiture was not eminently adapted for flashlight; it did not come near electric light. For interiors, such as churches, it was quite at home, so to speak, and for caves and subterranean matters invaluable. Its defects were that it was apt to cause people to blink their eyes; another was getting rid of the smoke; and, again, there were generally unburnt particles flying about, which would grind into carpets, &c. Demonstrations were then given, and the lecturer showed the way of placing lamps, using two pairs of steps, reflector, &c. The lights must be placed so that there was softness in the shadows, and reflections in the eyes avoided. Mr. DANDO had seen good pictures obtained by using platinotype lamps. Mr. Hudson showed his flash-lamp (continuous). He used magnesium powder, which was blown through the centre of a spirit lamp, and gave a continuous and powerful light.

Aldenham Institute Camera Club.—October 25, Mr. W. Vere Mingard presiding.—Mr. Allan Hair gave the second of a series of lectures on *The Eye as a Camera Obscura*. The lecturer briefly recapitulated the substance of his former address, and then proceeded to compare the receptive power of the retina with that of the sensitive plate in the camera. A very interesting account of the "visual purple" theory, tracing optical impression on the retina to the chemical decomposition of this substance by light, seemed to show a still closer likeness to the photographic process; but, when the lecturer stated that the eyes of the dove and the bat possessed no "visual purple," and that the yellow spot of the human eye was without it, the theory fell hopelessly. The subjects of distinctness and persistence of vision were next discussed, and the lecturer finished with a theory respecting the ability of the eye to appreciate colour, and its bearing on colour photography.

Harlesden (Willesden) Photographic Society.—October 25, Mr. J. Naylor in the chair.—Mr. Woodbury gave a demonstration on *Gelatino-chloride Printing Processes*. The Secretary handed round some samples of the new Paget prize lantern plates, kindly sent by the Company, and instructed the members in the methods of making lantern slides by contact and reduction. The next meeting, on the 22nd inst., will be a Lantern Evening.

West London Photographic Society (with which is amalgamated the Chiswick Camera Club).—October 27, Mr. W. A. Brown in the chair.—The CHAIRMAN introduced to the meeting the new President, Mr. J. A. Hodges, who then proceeded to deliver his inaugural address. After referring to the valuable services of the late President, and having given a word of welcome to the Chiswick Camera Club (now amalgamated with this Society), Mr. HODGES suggested that more useful results would ensue if members more generally joined in the discussions on technical papers. He then suggested that the Society might undertake a photographic survey of western London, and, after some advice to beginners to strike out a line of work for themselves and not to dabble in many processes, Mr. HODGES enumerated some of the most important photographic inventions of the year—viz., the photo-telescopic and concentric lenses, Van der Weyde's device for correcting exaggerations in portraiture, Willis's improvements in the platinum process, the Sandell plate, and improvements in celluloid films.

Richmond Camera Club.—October 24, the President in the chair.—Mr. G. Ardaseer showed Cowan's lantern-slide printing frame, a most convenient piece of apparatus for making slides by contact, and very suitable for collodio-bromide plates, as with it there is little risk of damaging the film by abrasion. Mr. F. P. CEMBRANO, jun., gave a demonstration of *Transparency-making without a Dark Room*. He said that it was his aim that evening to demonstrate that no dark room, nor even a developing lamp, or the use of non-actinic media, were at all necessary for the pursuit of that fascinating branch of photography, transparency-making. The reproach that amateurs were selfish because, no sooner they returned home from work, they shut themselves up in their dark rooms, could no longer be cast upon them. Long winter evenings could be sociably spent at home without giving up lantern-slide work, and, provided a little care was used when developing and the table was covered with a piece of oil-cloth, no damage need be feared for the furniture or carpets. Mr. Cembrano followed his remarks by developing several plates by the light and within three feet of an ordinary Argand gas burner, several of the gas jets in the room remaining alight. An ordinary dish was used, and the plates, while in the developer, were not screened from the light. The resulting transparencies showed absolutely clear glass in the parts that had been protected by a mask during the exposure. The exposure (contact) was one inch of magnesium at distances from three to ten inches. The first slide was made on a Cowan chloride plate, and was developed with pyro and carbonate

ammonia, and bromide and acetate of soda. The second one, also a Cowan's chloride plate, was developed with hydroquinone, caustic potash, and carbonate of ammonia, the resulting colour being a nice brown. A collodio-bromide plate gave also equally good results. The demonstration was brought to an end by exposing two of Marion's Bartolozzi opals, one of which was developed with amidol and the other with hydroquinone. The former gave a black image, while the colour obtained with the second developer was light sepia. Mr. ENNIS asked which would be the best way to obtain warm tones on slides. Mr. CEMBRANO replied that, with gelatine as well as with collodion, plates any colour, from black to red, could be obtained. He had not been able to get warm tones with eikonogen, but with pyro or hydroquinone a good rich colour could be got by giving a prolonged exposure and using a well-restrained developer containing carbonate of ammonia. Mr. ABDASKER added that he had obtained a warm tone with eikonogen by using carbonate of ammonia. The subject for discussion at the next meeting will be on *Preparing Work for Exhibitions*.

Croydon Camera Club.—October 31, Mr. Maclean in the chair.—Messrs. Diamond and J. B. Hartland were elected members. In consequence of gas supply failing, the showing of members' slides was postponed to Wednesday, November 2. Mr. C. E. Whitaker exhibited a large number of views of good quality (notably some toned by the Weir-Brown process), and Mr. Bray a strikingly original example of "picture-making," entitled *The Hay Nest*. On Friday, the 4th, the Robinson slides will be shown at Braithwaite Hall. Monday, 7th, Mr. Charles Hussey lectures on *Stereoscopic Photography* at the Club Rooms.

Aston Photographic Society.—At a meeting of photographers, held on Friday last at Burlington Hall, High-street, Aston, it was decided to establish a Photographic Society for Aston and district. Mr. Councillor SYDNEY FISHER presided, and spoke of the desirability of forming a means of social and mutual intercourse between those who practise the "dark art." There were also present Messrs. Tylar, Cracroft, Wollaston, Priddin, Casson, Cole, Wimwood, Dent, and other gentlemen. Among resolutions passed were the following:—"That a Photographic Society be formed." "That it admit amateurs and professionals." "That it meet fortnightly." "That it meet at Burlington Hall." "That we approach the Aston Natural History and Microscopical Society with a view to affiliating the Photographic Society with theirs, but taking alternate Thursdays for our separate meetings." The meeting was then adjourned until Thursday, the 10th inst., to decide upon future business then, and, after a vote of thanks had been passed to the Chairman, the company dispersed. Twenty members actually joined. Fee: 5*s.* per annum, or 2*s.* 6*d.* half-yearly, payable in advance. Communications to Fred. W. Pilditch, Acting Secretary *pro tem.*, 133, Wills-street, Aston.

Liverpool Amateur Photographic Association.—October 26, the President (Mr. W. Tomkinson) in the chair.—Messrs. A. Bradbury and E. V. Swinden were appointed to audit the annual accounts. Mr. R. J. Sayce exhibited two fine platinotype pictures of *The Strid* and *The Meeting of the Waters*, Bolton Woods, from negatives taken direct on 25×23 plates by Mr. Wm. Brown, of Leeds. Mr. C. B. Reader brought before the meeting an invention by himself and Mr. Potter, consisting of a new method of artificial lighting, specially adapted for enlarging and reducing. Taking equal quantities of magnesium powder and chlorate of potash, Mr. READER explained that, by means of a piece of perforated zinc, he distributed it equally over a sheet of pyroxyline paper, and upon this he pasted another sheet of the same paper. A piece of this preparation, about ten inches square, produced, when ignited, a flash sufficiently bright and lasting to make a lantern slide by reduction from half-plate. Mr. Reader showed a slide made in this way, which was equal in all respects to those made by daylight.

Stereoscopic Club.—October 28, Mr. James Whitelegg (President) in the chair.—Mr. W. LEACH read a paper on *The Projecting Polariscope*, with practical demonstrations in its use, showing that Nicol prisms of large size were no longer necessary, and that prisms having one inch or one and a quarter inches field, used in the lantern microscope, were sufficient to exhibit the maximum-size objects—viz., one and three-quarter inches—and also that, when even this size could not be obtained (for at the present day they were somewhat precious articles), a bundle of thin glass plates, using transmitted light in the lantern microscope, was a splendid substitute, and capable of producing results that could only be identified by experts in the science, and far surpassing the possibilities of the elbow or reflecting polariscopes, even when of the largest size. During the demonstration Huyghen's double-image apparatus was exhibited and explained, as was also the heating and compressing of various glasses, crystallisation, selenite, quartz, and mica objects, Norremberg combinations, &c. During the discussion which followed the lecture a member expressed himself deeply interested in the beautiful phenomena that had been shown upon the screen, but he confessed to not understanding "what it was all about." In the first place, he would like to know what was meant by polarised light? Mr. W. I. CHANWICK said the term "polarised" was not a happy one, and thought that, if the phenomena had to be rechristened a better term might be found. It was difficult to convey a clear understanding of the meaning of polarised light in a few words, especially to those who had not studied the nature of ordinary light. If a rope were stretched across a room and vibration be given to one end of it, say, in an up-and-down motion, the vibration would proceed to the other end as waves or undulations; if now vibrations were given to the rope sideways, say, from right to left, these would proceed as waves or undulations at right angles to the first series of waves; and, if a multitude of such ropes were made to vibrate in every possible plane transversely to the length of the ropes, they would represent the vibrations of a ray of common light, light being the vibration of an elastic medium which pervades all space, as sound is the vibration of air. But, when these ropes are caused to vibrate all in the same plane, they would represent polarised light. In other words, common light has all its vibrations in every possible plane transversely to the path of the ray, but in polarised light the vibrations are all reduced to one plane. A hearty vote of thanks was passed to Mr. Leach for his paper and demonstration. Mr. W. I. CHANWICK read a paper on *Dissolving Views* [see page 711], and gave a limelight exhibition of various modifications of what is generally understood as dissolving views. Some charming pictures were shown, and the apparatus much admired for its simplicity and efficiency.

Leith Amateur Photographic Association.—October 25.—The President (Mr. Dougall) introduced the lecturer for the evening, Dr. HUGH MARSHALL, who had taken as his subject *Lantern Work*. The Doctor, in his opening remarks, stated that the general consensus of opinion was in favour of wet plates, as producing in skilled hands the highest class of work of this kind, and with that he was in full agreement, but at present gelatino-bromide plates were in the ascendant, and in careful hands they *almost equalled* those of wet plates. Taking the popular gelatine plate as the key, he went fully into the chemical constituents and conditions of the lantern plates of that class as supplied to the amateur and professionals, and proved the possibility of having a perfect gelatine plate. Printing by contact for this purpose ("lantern slides") he explained and demonstrated, as well as copying from larger sizes by the camera. A simple but efficient apparatus of the kind, of his own construction, was shown, explained, and demonstrated. Another mode, he stated, of making either enlargements or reductions was by the optical lantern, a very simple form of which of his own make, recently devised, being shown, and by it he demoustrated his methods of making enlargements from quarter-plates or portions of larger plates. The making of slides from beginning to end was also skilfully shown, the Doctor showing himself to be a skilled mechanic as well as a high scientist in this department. In treating of the production of transparencies for other uses than the lantern, he was decidedly in favour of the use of matt varnish on the film side of the plate rather than the ordinary method of using ground glass, the latter being so variable in its character, the finest being very expensive, and the examples shown, were certainly good proof of the Doctor's skill in the use of his favourite medium. Thereafter he treated fully on the various developers for transparency purposes, explaining the qualities each had for giving tone, colour, delicacy of shade, and other qualities, demonstrating these without a hitch, using the ordinary gas for the light and his own apparatus for the other parts of the demonstration. At the close of this most successful meeting, and after lucid answers to many questions, the thanks of the body were tendered in most grateful fashion by the President for the delightful evening they had enjoyed, especially from its educational point of view. Before closing, the SECRETARY stated that he had been supplied with samples of the new developer, amidol, and related his experiences with it, and distributed them to those desirous of trying it. The next meeting is to be occupied with the annual exhibition of members' work for the past season, and in this connexion would it not be well for this and other Councils to consider the desirability of altering the annual meeting for the appointment of office-bearers to such a date as would allow the names of the newly appointed body to be printed in the current year's ALMANAC, instead of being a year behind date, as some of them are at present?

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

THE MEASURES OF DRY PLATES.

To the EDITOR.

SIR,—I do not know of any small matter that makes so much trouble to a man on a journey as the irregularities in the sizes of dry plates. I do not allude to the unpardonably careless cutting, by which the angles of the plates are not always right angles, or of an occasional neglect to cut in the right place, so much as to the want of a general understanding as to the measure. I have recently had some trouble with discrepancies between the ideas of the camera maker and the dry-plate manufacturer, due to the amiable mutual disposition to make way, each for the other, the former making a little allowance for the plate being not exact in its dimensions, and the latter calculating that the holder would be exact in its accommodation, and so cutting his plate a little short in measure, the consequence of which was that my plates went through the holder in some cases, and generally left one edge uncovered. With glass plates this is not so much matter, but when one uses celluloid films, as I am largely doing now, the edge that is not held in the frame of the holder gets out of the focus as well as out of the plane. Why should the societies not take up the matter and try to establish a general rule that the plates shall be in all cases cut to the *exact* nominal measure, and the camera makers make the slight allowance needed for the occasional, perhaps unavoidable, errors in cutting? For the carelessly cut plates there is no excuse, and the seller of them ought to be denounced and avoided; for, with the mechanical appliances now at hand, the cutting of plates to exact measure, barring variations in the fracture of the glass, is as easy as to cut carelessly and inexactly, but I have had celluloid films of an excellent and well-known make recently which were all cut the sixteenth of an inch short in both dimensions. The holders gave a sixteenth of an inch play, and the consequence is that there is the eighth of an inch to spare on both dimensions. The sight-measure of the holder is correct, but the play in the holder becomes too much, and the film sometimes misses its hold. If the plate makers will use the practicable appliances for cutting their plates with precision, and the camera-makers will leave play to the amount of one-sixteenth of an inch, it would be a great convenience for at least one experimenter who has not much time or patience to waste.—I am, yours, &c.,

NOV. 1, 1892. A WORRIED AMATEUR.

SILVER STAINS ON UNVARNISHED GELATINE NEGATIVES.

To the EDITOR.

SIR,—Gelatine negatives may be printed from without being varnished. This has been so written in many works on Photography. Quite right, they can; but in nine cases out of ten it means ruin to the negative later on. There must be many thousands of negatives apparently spoilt and useless for printing in the hands of professionals and amateurs, suffering from what I may best describe as silver measles, and put aside as worthless.

Several formulæ have been published to remove the same. Some will do so, but they have one little drawback, they generally remove the subject also. I recently had a charming series of negatives by a deceased amateur; many of them were very badly stained. Not liking to destroy them, I made a very exhaustive series of experiments, and at last was awarded for my pains by finding that by the aid of a very old and valuable chemical I can in a few minutes remove the silver stains without injury to the negative in any way. No previous soaking or after-washing is necessary; the solution is perfectly harmless to the negative, and does not contain any cyanide, acid, hypo, or anything that I have ever seen mentioned.

Now, as the proof of the pudding they say is in the eating, I make the following offer. I invite any and every professional or amateur photographer to send me during this next fortnight a negative such as mentioned by parcel post, and enclosing a properly directed card, with the necessary stamps for the return postage (without which I must respectfully decline to forward the same), and I will without charge send the negative back, and I think there will be no sign of silver measles. After that, if satisfactory business, I will call and show you some very bad samples with stains partly removed, and I will remove the other portion in a few minutes; but you will, I am sure, excuse me not showing "how it's done." I look upon it as a very valuable discovery, and in this instance I think I must keep it a secret, and try, while helping others, to help myself.—I am, yours &c., HORATIO NELSON KING.

4, *Avenue-road, Goldhawk-road, Nov.* 1, 1892.

[We may say that our friend, whom photographers generally will recognise as one of the few remaining clever veterans to whom the art owes so much, practically demonstrated the method at the Editorial offices, and we can testify to its efficacy and success. It should prove an idea of great value in actual practice.—ED.]

THE IMPERIAL PORTRAIT ASSOCIATION.

To the EDITOR.

SIR,—I was pleased to see the letter from your correspondent, William C. Ledger, referring to the Imperial Portrait Association. Some few months since they issued circulars to the public offering to take enlargements of cabinets free of cost, as they thought by advertising in this way they would ultimately get a good business, &c. I sent my picture; they have the enlargement, and want me to pay for it. I won't from principle. They won't return my picture. What steps would you take, Mr. Editor, to get from them my picture sent to them at their solicitation?—I am, yours, &c., ED. BIRKHEAD.

Lewes-street, Manchester, Oct. 31, 1892.

THE ARK.

To the EDITOR.

SIR,—I have been greatly interested in the published account of the finding of the Ark of the Bible by Archdeacon J. J. Norris, and I should be much obliged if you would let me know if the reverend explorer took a snap-shot of the marvellous object; and in that event, if and where copies can be purchased?—I am, yours, &c., JOHN GREEN.

[This subject is referred to in our leaderettes.—ED.]

MYSTERIOUS MARKINGS ON NEGATIVES.

To the EDITOR.

SIR,—May I be permitted, as an old amateur plate-maker, to relate my experience of markings such as those spoken of in your issue of the 28th?

For several years after the introduction of the gelatine process, I followed the general practice of drying plates in a box, through which a current of air was made to circulate by means of a gas flame. Plates of excellent quality, and free from these markings, may be obtained by this method of drying, if the current be maintained with unvarying steadiness, and the plates are not packed too closely. But if no mechanical arrangement is provided for regulating the supply of gas, sharply-defined lines, corresponding with each alteration in the pressure may be expected. It does not always follow, except in extreme cases, that these markings will be visible in the finished negative; but evidence of their presence may be obtained by holding a negative, when just surface dry, at the angle of reflection between the eye and a source of light, when, if the plate suffers from this fault, a line, or lines, may be perceived similar to, but not so deep, as those which divide the wet from the dry portions of partially dried negatives. Your correspondent may rely on this as a certain indication of faulty drying.

My plates being all required, either for stereoscopic negatives or transparencies, the necessity for spotless results caused me to abandon this method in favour of the slower, but more cleanly, plan of drying in a closed box, by the aid of calcium chloride. I soon discovered, however, that if any marked difference in the temperature of the room was allowed between the night when the plates were coated and the succeeding day, that markings of a somewhat different character appeared, development proceeding normally in the centre, but leaving the margin, perhaps for half an inch all round, pale and lagging. Now, my experience of these markings is that, if development is pushed on rapidly, there will be a distinctive band round the plate of less density than the centre portion; but if reasonable time be allowed, and the ammonia added progressively, and more especially if a somewhat stronger solution be applied round the edges with a brush, no marking will be visible. Is it likely that we have here an explanation of the difference experienced between manufacturer and user in the case cited?

Again, if plates are dried on heavy racks, which obstruct the free access of air to given portions, faint lines, or comet-like streaks, following the direction of the leaning-post, may be expected. For this reason I have found it necessary to use racks of the slenderest character, and to cut away the contact portions to a knife-edge. I think there are very few users of commercial plates who have not met with this defect at one time or another.

Insufficiently washed emulsion also gives rise to bands of a peculiar description, the margin and centre developing normally, but leaving a midway band of less density, some half inch wide. In extreme cases, the band is visible before development, and may be tacky or crystalline, in accordance with the soluble bromide which has been used. This defect is, however, out of the question as regards commercial plates.

I think it will be allowed, on reflection, that these markings—except the last named—may all be traced to one cause, namely, the varying rapidity at which given portions of the film are dried. In the first example, only a slow circulation would be induced by the midnight pressure of gas, therefore the centre of the plate, having the advantage of greater pressure, would be dried in less time, area for area. In the second example we have practically the same conditions; the plates being boxed late at night merely having the advantage of a sluggish current, due to the difference in density between moist air from the plates and dry air from the calcium chloride; whilst, during the succeeding day a better circulation would result from the gradual elevation in temperature. The difference between the two cases being that, in the latter, the two portions of the film merge quietly one into the other; and in the former—which are difficult to manage in development—there are one or more sharp dividing lines. The third case, relating to faint streaks or comets, manifestly arises from the same cause.

This result of quick or slow drying would seem to relate only to the gelatine, and not to the silver bromide, those parts dried slowly being least permeable to the developing solution. In support of this view, it is only necessary to examine a surface-dry negative in the manner suggested above, when it will be seen that the margin of such defective plates, or band of least density, is less elevated than the remainder.—I am, yours, &c., J. MELLALIEU.

6, *Long-street, Middleton, near Manchester.*

REMINISCENCES OF AN OLD FOGEY.

To the EDITOR.

SIR,—I saw to-day in one of your recent numbers an article on the "Preservation of Sensitised Paper." I was an enthusiastic amateur in "the fifties," and used to preserve my sensitised paper in a tin canister lined with paper, having a false bottom under which was a tray of fused chloride of calcium. A broad indiarubber ring round the junction of the canister and lid rendered it air-tight, and in the dry atmosphere sensitised paper would keep indefinitely, and now, while my pen is in my hand, pardon an old fogey if he twaddles a bit about the troubles of thirty-five years ago.

At that time I used to belong to the North London Photographic Association, the President being your then editor, Mr. Shadbolt. I think we used to exercise more care in the selection of our views then, when our plates cost us so much trouble to prepare. *Of course I except the masters of photographic art at the present day.* A short time ago I was in the Channel Islands, and on one of the cars which make daily excursions was an amateur photographer. When the car stopped and we all rambled about on a beautiful bit of coast scenery, I was amused at the "a. p." and his eagerness to pitch his camera; he selected a place (or rather put his camera down without selection) when he had the chimneys of a cottage in the foreground, and little else but sea beyond. Only one hundred yards along the path he might have got the cottage with a background of trees leading up to the path where he had stood; on the right a grand semicircle of rocks, and trees beyond stretching round across the picture in front and beyond the headland, the sea on the left. I introduced myself as an old "a. p.," and gently suggested a little more thought, but got

rather a curt answer. I suppose he had got his plates where, they say, "all you have to do is to press a button, we do all the rest!" In the fifties we had something more to do than press a button! A week's outing meant many hours' hard work, much anxious and careful cleaning and coating of plates, washing, preparation and filtration of "preservatives"—I used sometimes albumen, sometimes linseed emulsion, sometimes gelatine, sometimes gum arabic— much patient submission to semi-suffocation and irritation of the eyes from the ether fumes, and then the trouble of drying the plates without a check, which caused a line across the plate, and the care to avoid dust which caused pinholes. Now, after all this trouble, we did not waste our plates. My plan was to walk over the ground without my camera, notice the best point of view for every bit which attracted me, and the points of the compass, so that, if I found the best point to stand the camera was facing south, I knew it was no use being there at twelve o'clock. I then used to go again with my camera, timing my walk so as to arrive at the various selected points as near as possible at the best time.

And then the hard work! I worked 10 × 8, and cameras were not made so light as now, nor the stands, as we often had to give fifteen minutes', *not seconds'* (think of that, ye button-pressers!), exposure, and after each exposure had to go down on my knees with my head and shoulders in a black bag, with a square of yellow tammy and change the plate—jolly on a hot day!

Then the excitement of developing with acid pyro, and the delight of seeing a successful negative. That was the best part of the whole business. But, alas! when plate after plate turned out bad either from over or under-exposure, or from some accidental defect in preparation, then came swear words, I am afraid.

About 1860 I very nearly stumbled upon the emulsion system which has done so much for photography. About that time appeared in your JOURNAL a method of forming a film by dissolving cotton in a solution of copper in ammonia. As collodion was expensive and I was not rich, I took some pains with this idea. Of course, putting into it a plate coated with something containing copper and ammonia soon played the very dickens with the nitrate bath, and so I tried dissolving bromide and iodide in water and precipitating with nitrate of silver and adding the precipitate to the cupric solution of cotton. I *now* suppose that my dark room as then constructed was not sufficiently non-actinic, and that I had no idea of the sensitiveness of the precipitate. Anyway I failed. Although, owing to an accident which left me lame for life, I had to give up photography in 1861, I still like to read the journals and see what is going on, and if I can get an amateur to accompany me for a day in my trap I can take him to some choice bits and enjoy his company.—I am, yours, &c.,

October 28, 1892. OLD FOGEY.

POLARISED LIGHT.

To the EDITOR.

SIR,—I am not aware that the part played by polarised light in landscape photography has been fully pointed out. It is well known that the light from all parts of the blue sky is partly polarised, and that the amount polarised reaches a maximum in directions at right angles to the sun's rays. By using an analyser (a Nicol's prism, for instance) in conjunction with the lens of the camera, the polarised light can be entirely cut off, while the ordinary light, such as that from clouds, &c., is only partly extinguished. This use of an analyser appears to furnish a means of obtaining contrast between blue sky and clouds, &c., on the sensitised plate, and may also be found of service in obtaining natural clouds on landscape negatives. The light reflected from the surface of almost every substance is completely or partly polarised according to the angle of reflection, and this is the case with the white reflected light or glare from the surface of grass and landscape objects. By the use of an analyser with the lens this surface glare can, therefore, be partly cut out, leaving the light reflected from below the surface, which gives the object its colour, to reach the sensitised plate more or less unadulterated.—I am, yours, &c., W. GROVES.

Melford-road, S.E., November 1, 1892.

[The "part which polarised light plays in landscape photography" has been fully set forth and treated of in former volumes of this JOURNAL.—ED.]

KEEPING QUALITIES OF DRY PLATES.

To the EDITOR.

SIR,—Having read with interest the correspondence in your paper concerning the keeping qualities of gelatine dry plates, perhaps I may be allowed to give a recent experience, which proves that plates do not necessarily deteriorate through prolonged keeping. Coming across several boxes of plates which had been stored away for five or six years, I made a few experiments with them. Some of the dozen negatives produced were developed thin, and others dense, but in no case were any markings visible either at the edges or elsewhere. The plates developed clearly and rapidly, pyro-ammonia being the agent employed, and in every respect the results were similar to those obtained on new plates. The plates were packed in fours, face to face, with folded card at the edges, preventing actual contact of the films, each four plates being wrapped in orange paper, and the whole box wrapped and sealed in thick brown paper.

Stored in the same cupboard were some boxes of the same and other brands which had been opened and carelessly repacked, and these showed before exposure a discoloured band of nearly an inch in width all round the edge.

The plates were, of course, in a dry place, and I think their condition, after the length of time mentioned, goes to prove that, kept from the atmosphere by careful packing, an average brand of plate will remain for a considerable length of time in good condition.—I am, yours, &c.,

DRY PLATE.

To the EDITOR.

SIR,—In reply to the query, "Do Plates Deteriorate by Keeping?" I have exposed and developed a 12 × 10 plate which has been in stock over three years. Although something like twice the normal quantity of ammonia was required to bring out detail (owing to plate being under-exposed), the negative developed as free from fog and stain as a freshly prepared plate. I would, however, mention that I have had a whole batch of plates of the same make completely ruined in less than a year, stored under precisely the same conditions—in fact, side by side with the above. This I put down to the tissue paper used in packing, as the plates developed to full density where paper had not touched them, the portions in contact being insensitive.—I am, yours, &c.,

Whitby, November 1. J. ASTON BRIGGS.

THE EYE AS A CAMERA.

To the EDITOR.

SIR,—The reproduction of one's original ideas must, of course, be taken as complimentary; some acknowledgment is, however, generally considered fair and courteous.

I read, in your last impression, that a lecture on "The eye as a Camera" was given on the 4th ult. at Blackheath. At pages 18 to 25 of the second edition of my book,* *Photographic Manipulations*, will be found, illustrated with woodcuts, the first comparison made on this subject. Now my position is this, I am preparing for press the third edition of my work; if I remain silent now, when my book appears I, and not the lecturer, shall by my future readers be considered the plagiarist. —I am, yours, &c., LAKE PRICE.

Lewisham, November 1.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—On behalf of the Benevolent Association I beg to thank you for your suggestion on page 691 of your current issue. If the different Societies would act upon it, and devote the proceeds of one evening to the Benevolent, there is no doubt that a very great and good work could be done. It is curious that the same idea often strikes two or three people at about the same time, for only two or three days before your suggestion appeared I received a letter from Mr. Frederick Hollyer, offering to give to the Benevolent the proceeds of the last day of his Exhibition, now open at the Dudley Gallery, Egyptian Hall, Piccadilly. Mr. Hollyer writes: "I offer this, firstly, because I know that the money will be useful to the Benevolent, and, secondly, because I hope that the example may be followed by many other promoters of photographic exhibitions, and by the committees of the photographic societies throughout the kingdom." We have already appealed to the secretaries of the photographic societies in London to assist us by the sale of tickets for the Lantern Exhibition in aid of the Benevolent, which is given by the Photographic Society of Great Britain at their exhibition rooms to-night (Friday, November 4). We trust that every one who is interested will do what he can to make this a success, and also to give the Benevolent a good benefit on Mr. Hollyer's Benevolent day, which will be Saturday, November 12.—I am, yours, &c., H. SNOWDEN WARD,

Memorial Hall, E.C. *Hon. Secretary P.B.A.*

PHOTOGRAPHIC CLUB.—Wednesday, November 9, Open Night. Demonstration of *Cresco Fylma*. 16, Annual Dinner.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—November 10, paper on *Out-door Work*, by Mr. Ernest Milner. 17, Monthly Lantern Night. 24, Members' Open Night.

CROYDON CAMERA CLUB.—Fixtures: November 4, *Picture-making by Photography*, at Braithwaite Hall. 7, *Stereoscopic Photography*, by Mr. C. Hussey, at Club Rooms, 56, George-street. 21, Lantern Night; Members' Slides.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—November 8, Ordinary Meeting at the Gallery, 5A, Pall Mall East; Address by the President; Presentation of the Medals; paper by Mr. Howard Farmer on *Some Remarkable Properties of Silver and Gelatine*.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.—November 11, opening of the Association's new rooms at the Art Gallery, Newcastle; *Conversazione* at a quarter to eight, and Exhibition of Photographs, Stereoscopic Slides, and Lantern Demonstrations.

* John Churchill & Sons, London.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & CO.," *2, York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

H. C. Pettitt, Kewick.—*Photograph of embroidered pall used at Lord Tennyson's funeral.*

William Currey, Morecambe.—*Photograph of Dorothy Drew and the Right Hon. W. E. Gladstone, M.P.*

ANCIENT.—Received. Thanks.

ALBERT LEVY.—Thanks; we reciprocate your friendly sentiments.

DERENHAM & Co. (Weston-super-Mare).—Sichel & Co., 52, Bunhill-row, E.C., is the address.

T. BRAIN.—Use the sulphocyanide toning bath as recommended by the Company, and your trouble will, no doubt, cease.

CYMRO BACH.—We are not acquainted with any English work on retouching containing illustrations showing the different details of the art.

S. PORTER.—Any mixture of water colours that will match the tone of the print, strengthening the shadows with the addition of ordinary gum.

C. R. TRUEMAN, Albany Studio, Shrewsbury, wishes to communicate with Mr. A. Flint, who wrote us in regard to a flashlight arrangement. We have not kept the latter gentleman's address.

T. O. MORGAN.—One or more articles on the subject will appear in the forthcoming ALMANAC. They will supply far more information than it is possible to give in the limited space of the column.

L. M. says: "Can any of your readers give me the date of the number of the JOURNAL in which there appeared a table showing the comparative cost of lighting by gas, electricity, and oil?"—See page 140 of the JOURNAL for February 26.

SEPTIMUS.—The query about the regulations as to exhibits at the Chicago Exhibition should be referred to the Executive. A letter addressed to Sir H. T. Wood, Society of Arts, John-street, Adelphi, W.C., will secure the desired information.

A. W. R. complains that some pyro developer he mixed a week ago has gone to a deep sherry colour. On trying it, he says it works all right, but asks if there is any danger of the negatives developed with it turning yellow in time?—No; or, if they do, it will not be due to the developer.

T. T.—If the mounts are not of the kind ordered and the name is wrongly spelt, you are not bound to accept them. With regard to their being sold to any other person at a future time, we can say nothing, except that we should expect that no respectable house would do such a thing.

A. S. says: "In last week's JOURNAL appears an extract from *Anthony's Bulletin* in reference to an electric retouching pencil. Can you furnish me with any details of same? If not, where can I get information concerning same?"—Apply to Messrs. E. & H. T. Anthony & Co., of New York.

BACKGROUND says: "Can you inform me where I can obtain information about painting backgrounds? I wish a few hints on mixing distemper, and also advice as to what material to work on, and where to obtain it."—Such information is to be obtainable in the volumes of the JOURNAL for 1888, 1889, 1890.

GUARD.—The Welsbach light is not so good for enlarging purposes as the limelight. For enlarging on bromide paper a blow-through jet will answer every purpose. The exposure may be a little longer than with a mixed jet, but you will do well to put up with that at the expense of safety, as you are a novice with the light.

W.—Your query is one more particularly for a solicitor, as so much would depend upon the wording of the agreement. It seems to us that the restriction of a radius of twenty miles is *ultra vires*, but it is quite possible the agreement would prevent you from setting up in business in the same town, as it is but a small one.

GEORGE BANKART.—We are afraid we cannot assist you. The composition of the Platinotype Company's intensifier being a secret, it would be mere guesswork on our part to attempt to indicate a solvent of the image. Have you tried the effect of bleaching it with ferric oxalate, and redeveloping after a thorough washing? This might change the colour.

J. MOSES.—There would be little novelty in the camera if it depended only upon the material of which it was constructed. Cameras of small sizes have long ago been made of ebonite, and similar material. There may, however, be such novelty in its design as to entitle it to a patent. But the application of the material alone to cameras would not.

A. L. asks which is the hardest and, at the same time, purest gelatine in the market?—This is a difficult question to answer. On the whole, we should be inclined to give the preference to Nelson's X opaque. Some of the foreign gelatines are equally as hard, and perhaps more sightly in appearance, but they have the disadvantage of being more or less acid.

S. R. W. asks how to boil a solution that contains a considerable proportion of sulphuric acid, as an ordinary tin or iron vessel will not answer, and the enamel of the enamelled ware is seldom perfect. The best thing for the purpose is a Florence flask. They are supplied of all sizes by every dealer of chemical apparatus. For working on a large scale platinum vases are used, but we presume our correspondent wants something for an experiment only.

J. A. KAY.—1. Bromide paper usually curls "inwards" on the sensitised side, and the application of the tongue to a corner indicates to you the gelatine; thus there are two means whereby you may know which is the right side. 2. There are several photographic journals published in America. Messrs Percy Lund & Co., Memorial-buildings, E.C., will give you all particulars.

INQUIRER (Dublin) writes: "Is it practicable to enlarge direct on carbon tissue by the limelight? I should like to use the process for enlarging, but to first make a transparency and then an enlarged negative makes the thing impracticable to me."—For actual work the limelight will not do. It is not strong enough. The exposure would be so long, and the cost for gas so great, that the thing might be classed as impracticable.

B. W. J.—By a faded Daguerreotype we presume one that has become tarnished is meant. If so, the picture can be restored to its original state by treatment with a solution of cyanide of potassium. The details for doing it have often been published in these columns; but, if the picture is a valuable one, our advice is, Place it in the hand of some one who is familiar with the Daguerreotype process, or else get some other one of no value to experiment upon before treating *the* one.

R. THOMPSON.—If the negative is so extremely feeble, and resists all methods of intensification that you have tried—and you have named the best—the only way to make it serviceable is to reproduce it. First print a transparency on a plate giving good density, modifying the development so as to increase the contrasts. Then from that make a new negative, again proceeding for increased contrasts. By this means from the most feeble negatives a good printing one may be obtained.

C. W. says: "Can you please tell me if it is possible to copy any photographs up to half-plate, the same size, in my half-plate camera, which has a 7×5 rapid rectilinear lens optimus, and when the camera is racked out full it is sixteen inches from diaphragm slot to focussing glass? Can you please give me any rule for ascertaining the distances between photograph and lens, and lens and dry plate? The lens is advertised as eight and seven-eighths focus."—Consult the ALMANAC for 1892, in which a table for computing enlargements is given at page 858.

C. BLAKE sends two print enlargements on bromide paper. In one he complains of the inky black and chalky lights, and in the other of the grey even tone all over. He says he has made several enlargements from the same negatives, and they always seem the same. He asks if the negatives are at fault?—So far as we can judge they are all right, but the one is dense and the other is the reverse. The one print is as much over-exposed as the other is under-exposed. A shorter exposure in the one case, and a longer one in the other, will produce equally as good results.

S. DURNFORD.—If you have no experience in plate-making, we should certainly advise you to have your plates from England as you require them. Plate-making, under the most favourable conditions, particularly when the utmost sensitiveness is essential (as it must be in your case) requires considerable experience. In a climate like that of India during the hot season that would be still more necessary. If you received the plates in small tin-lined cases, and only opened them as the plates were required, there would be little risk of the hot, damp atmosphere injuring them.

S. J. writes: "Would you kindly inform me what solution is used to prevent the collodion film of a wet plate from washing off during development and washing? I know about flooding the glass with an egg albumen, but there is a kind of rubber solution used, painted round the edge of the plate with a wall brush, forming a safe edge."—With perfectly clean glass, and a good collodion, nothing is required. In order to save the trouble of cleaning the glass, a coating of dilute albumen is sometimes used. An edging of dilute solution of indiarubber in pure benzol may be applied to the edges of the plate if the collodion is of a very contractile kind, but the glass must be perfectly clean.

FORTHCOMING EXHIBITIONS.

November 10–12..... *Leytonstone Camera Club. Hon. Secretary, A. E. Bailey, South West-road, Leytonstone.
,, 15–17..... *Hackney Photographic Society. Hon. Secretary, W. Fenton Jones, 12, King Edward-road, Hackney.
,, 17–19..... Brixton and Clapham Camera Club. Hon. Secretary, F. W. Levett, 74, Geneva-road, Brixton, S.W.
North Middlesex Photographic Society.
,, 18–26..... *Stanley Show (Photographic Section). Hon. Secretary, Herbert Smith, 29, Finsbury-pavement.
,, 23–25..... *Tunbridge Wells Amateur Photographic Association. Hon. Secretary, Joseph Chamberlain, 14, Calverly Park-gardens, Tunbridge Wells.
,, 24–26..... *Exeter Amateur Photographic Society. Hon. Secretary, J. Sparshatt, Fairfield House, Alphington-road, Exeter.
*South London Photographic Society. Hon. Secretary, C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.

* Signifies that there are open classes.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1697. Vol. XXXIX.—NOVEMBER 11, 1892.

METHODS OF ARTIFICIAL ILLUMINATION FOR ENLARGING OR REDUCING.

Now that we are well into the lantern season and the period of home employment, in contradistinction to outdoor work with the camera, the question of artificial light for purposes of enlargement or the production of lantern slides will, no doubt, assume an increased importance with many of our readers. For contact printing, whether on glass or paper, the matter of lighting is one of comparatively minor moment, since almost any form of artificial illuminant—even down to a wax vesta—will answer every purpose with our modern films.

But the case is altered when the camera has to be used, as must necessarily be the case when a reproduction on a different scale from the original negative is required, for the difficulty then arises with artificial light of securing an equal illumination of every portion of the negative. With daylight this difficulty is not experienced, since the parallel rays—or practically so—coming from a tolerably clear sky give a uniformity of illumination that is quite perfect. Not so with the divergent rays proceeding from the flame of ordinary artificial illuminants, which, while strongly lighting the centre portion of the negative, fall off so rapidly in power towards the edges as to produce the effect of a vignette.

To remedy this defect the correct plan is to employ a condenser—a system of lenses which, gathering up as many as possible of the divergent rays transmits them in a slightly convergent cone of uniform illumination on the negative to be reproduced. Now it must be plain that, in order to perform this duty in a proper manner, the condenser should be slightly larger in diameter than the diagonal of the plate to be illuminated, and that therefore, on the score of expense, the condenser can only be used in conjunction with small negatives.

As a consequence, from the earliest days attempts have been made to meet the difficulty of uniform illumination in other and simpler ways, chiefly by the use of a number of separate lights either stationary or in motion, and aided by reflection and screens of various kinds, in order to increase the equality of the diffusion obtained. Many such plans have been described in these pages from time to time, and only in our last issue a novel method is mentioned as having been brought before the Liverpool Society by two of its members. The plan is sufficiently ingenious in conception to be worth noticing.

It is based upon the adoption of the magnesium flash system, but the novelty consists in the method of securing uniformity of illumination over a considerable area, the limits of which are, theoretically, unbounded, though practically certain mechanical considerations must receive attention. A mixture of magnesium powder with finely divided chlorate of potash is spread evenly over a sheet of papyroxyline or gun-cotton paper, and a second sheet is then superimposed and made to a space so as to enclose the flash powder. As is well known, magnesium when burnt in the presence of oxygen, or any oxygen-giving substance like chlorate of potash, produces an extremely actinic light, and in the combination referred to the gun cotton supplies the means not only of securing perfect combustion, but also the necessary uniformity of diffusion.

In use, it is only necessary to fix, or suspend, a sheet of the flash paper the size of, or preferably a little larger, than the negative, at a short distance from the latter, and upon igniting it a flash or flame of great intensity and evenness will occur over the whole area of the plate. The uniformity of action produced by such an arrangement would, it is not difficult to imagine, be sufficient to satisfy all requirements, even when used in close proximity to the negative; but, when a moderate distance intervenes between the plate and the source of light, the effect should be almost perfect, though, of course, a larger area of flash paper would have to be used. And here comes one of the possible objections to the method, namely, the inconvenience of igniting or exploding large sheets of papyroxyline, rendered additionally dangerous by the combination with chlorate of potash. Another difficulty that can easily be foreseen is the danger in handling the compound paper, especially in cutting it to size, as a very slight amount of friction would, we imagine, suffice to ignite it, with possibly not very pleasant effect.

The generally safer plan will be to adopt one of the many systems of multiple lights that have been described in our columns. The flash system with magnesium powder lends itself readily to the production of uniformity of illumination owing to the comparatively large surface of flame produced; but it is liable to the objection already mentioned, the danger and inconvenience of igniting large quantities of the powder at once and of making successive exposures with the accompanying clouds of smoke. The ignition of a single strand of magnesium wire or ribbon, except at a considerable distance from the negative, can certainly not be recommended on the score of evenness of lighting, and with the increase of distance comes a loss of illuminating power that seriously militates against its practical efficiency, so that the multiple system of lights is the one to be preferred.

The first arrangement of this kind that comes to our recollection is one that was shown at a meeting of the South London Photographic Society in 1879 by Mr. Brittlebank, and, though specially intended for portraiture, it seems to commend itself equally for the purposes we have under consideration.

It consisted of a screen or sconce of bright tin provided

with a number of tubes at regular intervals over its surface, through which strands of magnesium wire could be propelled by means of a simple mechanical arrangement. Beneath these tubes were, if we remember rightly, rows of small gas jets for the purpose of igniting the magnesium. When an exposure was to be made the gas jets were lighted, and could be kept burning during the whole evening at a slight expense. The separate strands of magnesium passed over or between rollers, all of which were actuated by the motion of a single winch handle, upon turning which the several strands of ribbon were pushed into their respective gas jets and simultaneously ignited.

For the purpose of securing complete equality of illumination over the surface of a negative of ordinary dimensions, say half-plate, it would probably be desirable to replace the bright metal screen or reflector with one having a dead surface, and of course it would not need to be of such large dimensions as for portraiture, some half-dozen strands of ribbon placed three or four inches apart being sufficient. It would in any case be desirable to allow the light to fall upon a sheet of ground glass placed a few inches from the negative, which, without intercepting an inconvenient amount of light, would conduce to greater uniformity in its diffusion.

Another method consists in the adoption of a reflector of roughly parabolic form, which may be used with a single light produced from ribbon or wire, or preferably by means of magnesium powder falling into a gas or spirit flame, placed on the focus of the reflector. The production of a reflector having truly parabolic curves is not an easy matter, but sufficient accuracy for our present purpose may easily be attained. A simple method of plotting out the necessary curve with extreme accuracy was exhibited at one of the "Brittlebank" meetings in 1879, and described in a leading article in our columns, but the mechanical difficulties surrounding the actual construction of such a reflector are considerable. A very effective, and, for all practical purposes accurate, instrument, may be constructed as follows :—

The object is to collect the rays proceeding from a point of light in a given position—known as the focus of the reflector—and to throw them out in a parallel or very slightly converging beam, the parallelism or otherwise depending upon the accurate position of the light. In the case of a large flame, and especially of a flash of magnesium powder, this becomes of less importance. Having plotted out the curve of the required reflector by the method alluded to, proceed to cut a piece of inch pine to the shape and dimensions required, and use this as a mould or pattern on which to bend a number of stout wires. Next prepare a circular piece of wood the size of the opening or mouth of the reflector, and bore at equal distances round its edge a number of holes, into which the curved wires are inserted, with their other ends meeting at a common centre, so as to form a sort of cage. In fact, if the mould or shape be placed in the hands of a birdcage-maker, with instructions to make a cage to that pattern, it will be the easiest way of securing a basis for the reflector. Of course, the more numerous and close the wires the better will be the ultimate effect.

Having obtained the frame or foundation, proceed to apply it in the following manner :—Cut a number of strips of paper wide enough to extend over two or three of the spaces between the wires, and it will make a better job of it if these strips are roughly shaped to correspond with the spaces. Having thoroughly moistened these, proceed to lay them as smoothly as possible over the wire foundation, joining the edge only with paste. When the frame has been entirely covered, similar strips are pasted over the first in repeated layers until a sufficiently strong shell has been formed, in the case of these last strips the whole surface, and not the edges only, being covered with the adhesive. The first layer of paper may be white, but brown paper afterwards will give greater solidity.

When, say, five or six layers have been built up, the whole arrangement must be put away in a moderately warm place to become thoroughly dry, and when this occurs the stiff shell is carefully removed from the wire foundation. The necessary apertures are then cut for the introduction of the illuminant and the escape of smoke, and the whole thing finished off in the best manner that suggests itself.

A less perfect reflector, but still an efficient one, may be constructed by nailing together four triangular pieces of wood so as to form a square pyramid, the shape of the sides and their consequent slope being so calculated as to throw out the rays proceeding from any agreed point in a nearly parallel direction. Such a reflector is within the capacity of any one who can use a saw ever so little, and in practice answers very nearly as well as the more perfect form.

The arrangements for inserting the light, be it gas or spirit, must be such that the magnesium is ignited at the focus of the reflector as calculated. If the whole can be made adjustable after the manner of the jets of an ordinary lantern so much the better, for then the position can be altered until the greatest evenness of illumination is obtained.

EXPEDITING WORK FOR CHRISTMAS.

The cry of the afflicted photographer is already being heard—"Christmas is close on us, and we can't get good prints in bad weather, neither can we hurry or expedite it; the light cannot be compelled," and so on. To a great extent his plaint is true; but, at the same time, he has in hand, if he cares to make use of them, many more expedients than was formerly the case. "The good old albumen print" is a sheet anchor; but even with it he need not lose the time he often, to our knowledge, does. Keeping, for the moment, to that style of printing, it is permissible to remind him that the loss of prints—good prints, that is—brought about by yellowing of the paper when bad light and exceptionally dense negatives cause the print after toning to be lacking in brilliancy and colour, need never occur if he use carbonate of soda impregnated pads in his printing frames. This plan is no secret, we have often referred to it; but how many utilise its benefits. It has positively no disadvantages beyond the possibility of injuring the surface of the varnish if a negative be left in contact with the backing. But to name this is to suggest a remedy. It may further be remarked that not only do these pads prevent the yellowing, but they permit the toning to proceed, with say a three days' old print, just as with fresh paper.

Then, again, we need not emphasise the merits of one or other of the brands of ready-sensitised paper now so freely offered. It goes without saying that following their use no yellowness or difficulty of toning, through long keeping in the printing frame, is experienced; but beyond this it is unquestionable that most of such brands in the market print distinctly more quickly than the usual home-prepared papers. We are aware that some photographers object to their use, though their number is rapidly diminishing, owing to the difficulty they experience in

getting their accustomed "tones." This, however, is mere matter of practice. Naturally the treatment required is different from that given to ordinary prints, and if the two be toned together uneven results often occur. A few experiments with variations of treatment will soon place the two on a level at the very least; and if a separate toning bath be kept for ready sensitised paper there need be no fear of its putting the toning bath out of order as some imagine it does.

But now, for winter work, there can be no question that albumenised paper is gradually being edged out by the gelatine papers that of late have been brought forward in profusion of brands. They are cheap—a very decided advantage—and, more important than all, their quick printing power is unquestionable, some holding them to be fifty per cent. quicker; but we have been credibly informed by those who have put them to the actual test that such a proportion decidedly understates the case, and that half the time required for albumenised paper more fairly represents what ready sensitised can do in this direction. To some workers, anxious for a reputation for permanency in their prints, the "combined toning and fixing bath," recommended for such papers, offers insuperable obstacles, owing to their belief that all probabilities are in favour of the resulting prints succumbing quickly to the hand of time. It is impossible to say with certainty, for there are prints in existence toned by that method, before the advent of alkaline gold toning, which appear as bright and fresh as the day they were printed, though it is well known that such examples of permanency are in a deplorable minority. But a few experiments will prove to any one that prints of the highest excellence may be toned without recourse to this old system (for, however new formulæ may modify old ones, the underlying principle is the same). Gelatino chloride paper can be toned, and toned well, to a variety of colours by one or other modification of the old alkaline toning baths. Carbonate, tungstate, biborate, and other soda salts, are now utilised with greater freedom than hitherto, and are capable of producing great variety of effects. Even the standard "acetate bath," used with judgment—though experts aver that it is not the best—is capable of toning these papers to very beautiful tones.

We have, further, papers of the aristotype brand or its many imitators. These are very quick printers, and possess many advantages that we cannot here pause to enumerate. It is enough to say that, by their aid, beautiful prints may be obtained from otherwise worthless negatives.

Lastly, we come to developed prints. It cannot be denied that many of the prints on bromide paper, as sent out from average studios, are wanting in transparency in the shadows; but here, again, practice is needed. Let any one turn to the pages of our ALMANACS of a few years back, and note what bromide prints are capable of. Even where beauty of results is the first consideration, we do not hesitate to say that some of the examples we refer to may, for richness and delicacy of colour, and good quality in the shadows, challenge comparison with any print ever produced by any process. "What man has done man may do" is a good photographic motto. And, looking on the rapid-printing side of the question, we can only say that with bromide prints it is a mere question of labour. A day will suffice to get from a large number of negatives a far greater amount of work than is ever likely to be needed in the busiest of studios. In conclusion, we can only say that a few judicious experiments, carried out with judgment and patience, will enable any photographer to settle, in the most satisfactory way, the question of how to expedite work for Christmas.

Photographs of Jewellery.—In most sensational law suits photography figures conspicuously in one form or another, but in the recent "Brooch Case" this was not so, though reference was made to drawings of the trinket in dispute. Had photographs of the two brooches been in existence, the trial would doubtless have been shortened, or, possibly, might not have been necessary. Many ladies are vain of their jewellery, and proud of showing it to their friends. Why should it not be tastefully grouped and photographed, and prints given to their friends? If that were done, in case of loss the photographs would frequently aid in its recovery. Photographs of some "family jewels" would be well appreciated by many in the upper circles. Here is a hint to enterprising photographers.

The Benevolent Association "Benefit" at the Photographic Society of Great Britain.—The "Benevolent" night at the Photographic Society of Great Britain Exhibition, on Friday last, was adversely affected by the heavy rain, and, as a result, the attendance was eighty-five less than last year. The number who paid at the turnstiles, however, was only two below last year's record, and it is not yet known how many tickets were sold and not used, so that the Committee of the Benevolent cannot tell how the monetary result will work out. Mr. J. Spiller, the Treasurer of the Benevolent, opened and closed the proceedings, and the lantern entertainment was arranged by Mr. T. E. Freshwater, the lantern itself being under the able management of Mr. R. R. Beard.

A Lesson of the Exhibition.—The 1892 Exhibition of the Photographic Society of Great Britain is now a thing of the past, and the unanimous opinion of art critics is that it was the most successful ever held. In it the artistic element was infinitely more pronounced than on any former occasion. Notably was this the case with the majority of the prints of a sepia tint on rough-surface paper. As with painters, so with photographers; when success is attained and praise awarded there is often a tendency to overdo the thing. Now, it would be regrettable if this were done in the direction just referred to. For years past we have advocated the use of matt and rough-surface paper for the higher class of work; but there is a limit to its application, and there may be a question whether that limit has not now been reached, if in one or two instances it has not been overstepped. It must be borne in mind that a surface which is admirable for a picture say fifteen by twelve, may be far too coarse for one of the quarter-plate size. In determining on the surface of the paper, the size of the picture and its character should be taken into consideration.

A Museum Wanted.—Last week the remaining stock of Mr. J. Werge, who has retired from business, was disposed of by auction. As Mr. Werge was not only one of the oldest photographic dealers, but is one of the oldest of living photographers, it may be surmised that amongst the collection was some of the earliest of apparatus of the purpose of which the majority of those who saw it were entirely ignorant. It was rather amusing to overhear the conjectures of two or three evidently modern amateurs as to what the sensitising box, mercury box, and buffs of a Daguerreotype apparatus were for, or how they were used. Apparatus and appliances of the earliest period is year by year becoming rarer and rarer. Therefore, when such a collection as this is put upon the market it should be secured and deposited in some place where it could be seen by photographers. Such a collection would not only prove interesting to future generations, but also to the present, as evidenced last week. We are quite aware that there is a small collection of ancient photographic apparatus in the Science and Art Department, South Kensington, but it is stowed away in a remote top gallery, and we doubt if one per cent. of those interested in such matters know of its existence.

Blood Albumen.—When albumenised paper has an offensive odour it is imagined erroneously by some that it must necessarily be prepared with blood albumen. A case was tried in one of the Law Courts recently, which was interesting as showing the scale upon

which this albumen is made, and some of the purposes to which it is applied; also the price at which it is sold. The action was brought by the manufacturer to recover the value of four tons of the albumen at threepence per pound. The defence was that the bulk was not equal to the sample. Experts were called on both sides, with the usual conflicting results. It was admitted by the manufacturer that the albumen was of inferior quality, and that the smell was not good, hence the low price at which it was sold. He said the price usually paid for good albumen was 7½*d.* or 8*d.* a pound. Two samples were handed to the learned judge, who at first could detect no difference between them in the smell, but afterwards he said he "thought sometimes one smelt worse, and sometimes the other." In the end he decided in favour of the plaintiff. The albumen was to be used in this case in calico printing, for which large quantities are required. Blood albumen is also largely used in the clarifying of sugar. It was stated that it required the blood of about 2500 bullocks to make one ton of blood albumen. If this be correct, but little over a pound of albumen can be obtained from the blood of a single beast.

Photographing an Image by Reflection.—Mr. F. J Smith, of Oxford, writes to *Nature*: "The great utility of spark photography for obtaining time records of quickly moving objects must be apparent to all who know the experiments of Mr. C. Bell, Professor Boys, and Lord Rayleigh. By means of spark photography the shadow of any object, such as a jet of water, a flying bullet, or a broken soap film, can be produced with perfect definition. The shadow of the moving object illuminated by an electric spark is thrown on to a sensitive plate in a dark room, and the plate is developed in the usual manner. The process of spark-shadow photography will be found, I believe, of great service in physiological research. With a view to try this, I attached a long sensitive plate to the traversing carriage of a chronograph; the moving carriage closed and opened the primary circuit of an induction coil at prearranged equal intervals of time. In front of the moving plate a frog's heart was placed in a slit on a screen; at each break a shadow of the heart was thrown on to the plate by means of the induced spark. By this means thirty positions of the heart were registered; the pictures were all sharp and clear. I have also used the same method for photographing the movements of insects. Since these experiments, which I showed during the University Extension Meeting in Oxford this year, I have made several attempts to get spark photographs of the front view of objects (not their shadows). In my first experiments the objects were illuminated by an electric spark, the image being received on a plate in an ordinary camera. I found that so much useful light was shut off by the lenses, that only a dim picture could be produced. A quartz lens was next tried, and the results were rather better. I then determined to use no lens, but in its place a silvered mirror. A concave reflector, made by silvering a concave lens of about 10 c.m. diameter, was so placed that it reflected the image of a white-paper star 7 c.m. diameter, revolving about sixty times in a second, on to an ordinary photographic plate, the total length traversed by the light being 80 c.m. The star was illuminated with a spark exactly similar to that used in the previous experiment; on development, a good picture of the star came out. The reflector was neither well made nor well silvered. The idea was suggested by observing some spark photographs I obtained of waves on the surface of mercury reflecting light. When a steady light is used, a photograph of any object is readily obtained by reflection from a suitable mirror. Probably a steel surface would be best. The mirror and plate were placed in a long box provided with a hole at one end, through which the light reflected from the object passed. A few experiments made on living objects to test the time of exposure in reflection photography showed that, in order to avoid over-exposure, a very rapid shutter must be used."

HOW SOLIO PAPER IS MADE.

ACCEDING to our request to witness the preparation and packing of the Solio paper of the Eastman Photographic Materials Company, Limited, we were permitted to visit the Company's large factory at Wealdstone, Harrow.

We very well remember the first visit we paid, not so long ago, to the works, at that time in an inchoate state, for the builders had not got much over the first story. The roads in the immediate vicinity were in such a state as to prove almost impassable, conveyances being sunk half-way up to the hub. *Now*, asphalte pavements and the hardest and smoothest of roads attest the influence of the Kodak factory (as it is locally called) upon the local authorities, who recognise that there is an important industry in their midst, and one which it is worth their while to encourage as far as lies in their power.

There are, in reality, two factories, end to end, separated only by the engine-houses, and each three stories in height. As an immense quantity of water is a daily necessity, the Company some time since rendered themselves independent of the usual sources of supply by sinking an artesian well on their own premises, which amounts to seven acres or thereabouts. One of the two factories mentioned is mainly devoted to the manufacture, output, and printing of sensitised or Solio paper, the other exclusively to that of films. In the former are located the negative, developing, and printing departments, in addition to the offices and stock-rooms.

In the Solio coating-rooms are to be found huge rolls of paper, specially manufactured for this purpose. One of these rolls is lifted up to its suitable support, and, having been unrolled to a sufficient extent, its end is brought under the domination of silver-coated rollers, and caused to pass across the surface of the gelatine emulsion with which it is to be coated. The machinery is then started, and the paper is coated, equalised, festooned for drying, dried, and finally brought out at the other end of the drying-room in a state of perfect dryness, without having once been touched by the hand.

The mechanism by which all this is effected is of the most remarkable kind, seeming as if, when once started, it did all the thinking that was necessary from the immersion in the emulsion up to the stage at which an attendant, with hands encased in white gloves, supplied it to another machine, by which, and with the aid of automatic guillotines, it eventually was presented as flat, cut-up sheets of various sizes, ready for transference to another department.

The Solio paper which we saw coated was twenty-four inches wide, and it was coated at the rate of about fifteen feet per minute, a *mile and a half* being the present output per day. It is all dried, cut up, and packed the same day as made, and is shipped off.

In the examining and packing-room we saw a whole regiment of young ladies, deftly submitting each sheet, small and great, to an electric-light lantern, faced with yellow glass, by which the slightest spec or imperfection, if such existed, could be at once seen. During our visit to this department no sheet was observed to come under the ban, but we were told that all such, when discovered, are summarily rejected and subjected to a further retrimming, in which the portion containing even the tiniest of spots is relegated to the waste room.

Mr. J. B. B. Wellington, the chief of the factory, who acted as our guide, informed us that they insisted from first to last on the sensitised paper or films never being touched by the ungloved fingers, as it was a well-known fact that the exudation from even the cleanest hands set up an action on the sensitive surfaces which, sooner or later, proved detrimental, and hence the insistance upon the employment of gloves in all departments involving contact with such delicate surfaces. The result of this was all that could be desired, as they never experienced any stain from this source.

The same care was taken in the encasing of the cut sheets into the envelopes in which they are sent out. These envelopes, for the retail consumer, contain, as is well known, a certain number of sheets, which, no matter how large or small the size, is sold at a similar price per packet, based upon the area of the paper contained therein, so that a packet containing only a few sheets equals with a wonderful degree of precision another containing a large number of those of smaller dimensions. These envelopes are all made on the premises, being cut out by machinery and closed by hand labour. In no adjoining room were being made the boxes in which the sensitive films for roller-slides are packed. The great care taken in ensuring uniformity and perfect equality throughout, coupled with that scrupulous cleanliness which was apparent at every stage, appeared to us to be a healthy outlook for the users of the productions.

Before leaving, we were privileged to examine the adjacent factory devoted to films, and in passing through some of the storage and

chemical rooms we witnessed the whole operation of dissolving gelatine from a stock of three tons, which was on the premises at the time. The emulsion is mixed fifty gallons at a time in a tank, from which it is drawn by means of a four-way tap into reservoirs placed below. Concerning the way in which the emulsion is washed by engines working automatically, it would prove of interest to such a limited portion of our readers that we shall make no attempt to describe it, more especially as to do so would involve the necessity of making drawings, which, in the dim light prevailing there, it would have been impossible to make. We saw, however, a huge centrifugal separator in this room, and through this all the emulsion has to pass. A batch of emulsion having been made and tested by the Hurter & Driffield system, to which Mr. Wellington gives preference over all others, it is conveyed to the cold storage-room, where, by suitable refrigerating apparatus, the temperature is kept several degrees below the freezing point summer and winter, thus rendering atmospheric influences altogether inert upon the precious productions stored therein.

What interested us probably more than all the rest was the preparation of the flexible films with which the firm's name is now so intimately associated. Twelve plate-glass tables, each eighty feet long by three feet six inches wide, and occupying two floors of the factory, form the basis on which the celluloid is made. Eight men were in attendance in the conducting of this. First of all, each table was closely examined to see that it was absolutely clean; but, as if to render assurance doubly sure as regards this, a long plush brush, the width of the table, was placed in supports immediately in front, and forming part of the coating machine, a reservoir in which was then filled with an oily-looking fluid by the attendants. This being done, and everything now being ready, a lever was pressed, and the steam-engine did the rest, for the coating apparatus at once commenced to move with a unform pace towards the far end of the table, leaving a beautifully even, but still fluid, film behind it. Arrived at the far end of its eighty feet of travel, the "button" was again pressed, and the engine was stopped for a few moments until the attendants had lifted the coating machine to the next table, where the reservoir was once more charged from vessels like those by which milk is sent to town per railway, after which all went on as before until the twelfth of the eighty-feet tables had been coated. When quite dry, and without any great delay, the celluloid was coated with emulsion in somewhat like manner, but in darkness so dense as to be almost painful, although relieved by a feeble glimmer of red light.

By special means, a difficulty occasionally encountered by some amateurs has here been entirely got rid of; we allude to the liability of a celluloid film when being stripped from glass giving an electric spark, and thus damaging the delicate bromide superstratum. The means adopted by the Company for the prevention of this have proved quite effectual.

At the time of our visit there were 120 people employed in this industry.

CONTINENTAL NOTES AND NEWS.

The World's Photographic Press. — According to a German contemporary, there are eighty-two photographic journals in existence throughout the world: France having 19, Germany 15, America 13, England 12, Italy 5, Holland 3, Spain 3, Belgium 2, Russia 2, and Sweden, India, Australia, Finland, Portugal, Switzerland, and Japan 1 each.

Detaching Gelatine Negatives from Glass.—Herr Liesegang's method of detaching gelatine films from the glass supports without employing the hydrofluoric acid plan is to introduce between the gelatine and the glass carbonic acid gas, which will effect the separation. The negative or positive, after development, &c., is plunged into a bath made feebly acid with either citric, hydrochloric, or sulphuric acid, and then, without washing, is placed in a concentrated solution (25 to 30 per cent.) of carbonate or bicarbonate of soda. The carbonic acid gas thus formed puffs up the gelatine, which can then be easily removed. The film undergoes some enlargement, which could probably be obviated by a bath of absolute alcohol, and when dry the film is perfectly flat, and can then be attached to a collodion or gelatine support, as may be desired.

The International Congress.—The next meeting of the International Congress on Photography will take place in 1893 at Geneva, when the work of the Congress assembled last year at Brussels will be resumed.

The Dangers of Developer Pastilles.—In reference to the growing popularity of developer pastilles in Austria and Germany, M. H. Fourtier, in the *Photographic Gazette*, endorses a former protest of M. Davanne against the eminently dangerous forms given to these photographic products. Developer and other pastilles in these engaging shapes are likely to be mistaken by children for sweets, and thus possibly cause them irreparable damage. Perhaps this may act as a note of warning to amateurs using these pastilles to keep them out of infantile reach.

M. Lippmann's Experiments.—At the last meeting of the Paris Academy of Sciences some coloured photographs of the spectrum on albumen and bichromated gelatine, by M. G. Lippmann, were exhibited. It was stated that albumenised and gelatinised plates soaked in bichromate of potash may be employed for photographing in colours. They are used like silver-salt plates, being placed so that the mercury is in contact with the film. The colours will appear immediately after immersion in water, which develops and also fixes the image. It disappears on drying, but reappears as soon as the plate is soaked. The colours are very brilliant, and visible at all angles. Those of gelatine plates are brought out by simple breathing. The theory is analogous to that of silver plates, the maxima and minima of interference producing hygroscopic and non-hygroscopic layers with varying refractive indices.

Gelatino-chloride Papers and their Keeping Qualities.—M. Ducom, who has devoted a great deal of labour in the investigation of the properties of commercial gelatino-chloride papers, says that, in order to make a paper which will keep in stock for a period of two or three months, it is necessary that the emulsion should be strongly acid. Paper coated with neutral emulsions, however, tones more readily, while acid emulsions have a tendency to give greenish-black tones. M. Ducom quotes M. Maurice as recommending the following method of toning. The prints, without washing, are immersed in a solution consisting of—

Alum	20 grammes.
Common salt	10 „
Chloride of gold (a one per cent. solution)	10 „
Water	1000 „

The prints tone in this in five or six minutes, and, after washing, are placed in the following:—

Hyposulphite of soda	250 grammes.
Nitric acid	4 „
Alum	20 „
Ammonium sulphocyanide	20 „
Lead acetate	3 „
Water	1000 „

The precipitate redissolves in a day or two, or the solution may be filtered after ten or twelve hours. The nitric acid is said to keep the whites clear.

Aluminium Chloride in Gelatino-chloride Toning Baths and with Amidol.—Herr Stolze recommends aluminium chloride as a good substitute for common alum or chrome alum. The same gentleman also employs it with amidol for developing gelatino-bromide prints in order to harden the gelatine, adding a volume of aluminium chloride, 1 : 100, equal to the volume of the developing solution. Development is thereby slowed, but more detail is said to be obtained, and the prints, after development, will stand a comparatively high temperature of the wash water—higher, in fact, than if aluminium had not been employed.

Para-amidophenol Citrate.—A solution of citric acid is, according to Liesegang, an excellent solvent of para-amidophenol—ninety-seven grammes of the latter being soluble in two hundred grammes of the citric acid solution of equal parts, the para-amidophenol being added little by little at a temperature of 18° to 20° C. The citrate of para-amidophenol so formed is employed as a developer in the following proportions:—

Para-amidophenol citrate (concentrated solution)	1 c.c.
Sodium sulphite (concentrated)	4 „
Sodium carbonate	5 „
Caustic potash (ten per cent. solution)	2 „
Water	50 „

This gives dense blue black images full of detail, the image, with normal exposure, appearing in about ten seconds. Brown tones are obtained if the para-amidophenol citrate is rendered alkaline with caustic potash. The citrate and sulphite are also applicable in aqueous solution as a developer for partly printed images on gelatino-chloride.

Matt Aluminium.—In order to impart the appearance of matt silver to metallic aluminium, the object is plunged, for from fifteen to twenty seconds, in a ten per cent. warm solution of caustic soda saturated with common salt. It is then washed and brushed, reimmersed in the same bath for half a minute, and finally washed and dried in sawdust.

AN INDIAN STUDIO.

A CORRESPONDENT forwards us the following particulars of Mr. Shapoor N. Bhedwar's studio:—The name of Mr. Shapoor N. Bhedwar must have been deeply impressed upon the minds of all those who have taken an interest in the exhibitions of photographs in England during the last three and a half years, and as we happened to be recently in Bombay for a few days, we felt we could not lose the opportunity of calling upon him and seeing for ourselves not only his earlier work, but also what further pictures he had in hand for future exhibitions; we further were sure that Mr. Bhedwar's many friends in England would be glad to hear what he was doing in his own home.

We have taken the greatest interest in all that appertains to photography for very many years, but having been resident in India for the past twenty years (with the exception of 1887), we have not had the chance of seeing those pictures for which Mr. Bhedwar was awarded so many valuable prizes—valuable not perhaps so much from their intrinsic value, but from the fact that they represented well-earned victories over the leading English photographers.

The studio is situated in the fashionable quarter of Bombay, on Cumballa Hill, whence a magnificent view of the town and harbour is obtainable on clear days, which, by the way, are much more numerous in India than in England.

The reception room has its walls covered by the best productions of Mr. Bhedwar, prominent among them being the series *Feast of Roses*, which alone secured some six prizes, including two championship gold medals and a silver cup. The room has more the appearance of an art gallery than an ordinary photographer's reception room; small work being conspicuous by its entire absence, and photography being represented by pictures 15 × 12 and thereabouts, all on plain paper, and some magnificent enlargements on bromide paper and opals, some of these being beautifully finished in colours.

The next room contains a collection of pictures taken by the well-known H. P. and R. W. Robinson, the former being represented by such photographs as *A Merry Tale* and *When the Day's Work is Done*, and the latter by a selection of his *Artists at Home*.

The studio is a fine room very handsomely furnished and contains very little photographic apparatus, one or two backgrounds and a few accessories being all there is to show its use. The dark room is large and suitable to the climate, being open at each end.

After we had been conducted over the whole establishment, Mr. Bhedwar was good enough to show us some of the work recently finished and some still in course of production; of those completed the leading series was *The Consecration of a Parsee Priest*, which we believe is now on exhibition at the annual show of the Photographic Society of Great Britain, in London.* In this series Mr. Bhedwar shows much artistic feeling, the posing being well marked in intention and his manipulation of light and shade very delicate and correct.

A series of pictures of a Hindu lady was simply delightful, but being made for a private patron, they are unfortunately not available for public exhibition. Should Mr. Bhedwar succeed in getting permission to show them, they would, we are sure, be hailed with acclamation; they show what an artistic photographer can make of ordinary portrait work.

Mr. Bhedwar is now engaged upon some pictures for next year; they are to be entitled *The Amir's Daughter*, and when finished will be found quite up to the general high average of his work. In this series he is making his first trial of combination printing, and we had the opportunity of seeing one in progress.

So far as the ordinary work of a photographic studio is concerned in the production of *carte-de-visite* and cabinet portraits, there seems little at present, Mr. Bhedwar apparently laying himself out for a higher class of work; but assuredly as the fact becomes known to the residents and visitors of Bombay that an artist of Mr. Bhedwar's powers is living in their midst, the amount of work that will fall to his share will rapidly increase.

We do not think that the ordinary run of photographers will be injured by Mr. Bhedwar's advent in Bombay, as there is not a very great demand at present for such works of art as he produces; but we think there can be little doubt that it will very soon become the fashion for the beauty, rank, and wealth of Bombay to be immortalised by Mr. Bhedwar's camera, his portraits being not merely likenesses but also "pictures."

Mr. Bhedwar apparently used no glazed surfaced paper, but confines himself solely to prints on plain paper toned with platinum, which process gives his productions every chance of permanence, even in such damp heat as Bombay enjoys.

In conclusion, we may state that even without any wish to be photographed oneself, one is amply repaid for a visit to Mr. Bhedwar's studio by a sight of the lovely pictures.

* If these pictures were intended for the Society's Exhibition, it would be interesting to know why they were not there.—ED.

THE AMATEUR QUESTION.

[Dundee and East of Scotland Photographic Association.]

THE feeling may not be universal, but there can be no doubt that, in some quarters at least, a certain amount of animosity is springing up between the professional and the amateur. Those who study periodical photographic literature cannot have failed to have come to the conclusion that the relations between the professional and the amateur are strained. This is a new and unwelcome condition of things, and, as this Society has in a great measure lost hold of the professional element, it might be profitable to inquire whether this is in any way due to the same causes that have led to the general estrangement of professional and amateur.

I am fortunate in a large circle of friends, amongst both professionals and amateurs, and have heard both sides of the question debated, with great freedom sometimes. Like most debated points, there is a good deal to be said on both sides.

The question hangs more or less on statements which are themselves either uncertain, or, at best, matters of opinion. In such cases the decision should rest with the *preponderance* of opinion, since there is no higher tribunal to which to appeal.

Under these circumstances, while I shall certainly give my own views on the matter, it is to be understood that I make no claim beyond introducing the subject. I have heard it said, Why discuss the point at all? The amateur is entirely independent of the professional, and cannot be injured by him; let him rave.

This is, to say the least of it, not a generous attitude; and, since the professional makes a distinct charge against the amateur, it surely is right that he should look after his character.

The allegations are, firstly, that professional photography is on the decline; and, secondly, that amateurs are in great measure to blame for this. Should the first allegation fall to the ground, the case against the amateur necessarily breaks down, and there is an end of the matter. On the other hand, should the first allegation be sustained, it then becomes necessary to determine if the amateur is to blame for this; and, if so, how far he is justified in ruining the professional for his own sport.

IS PROFESSIONAL PHOTOGRAPHY ON THE DECLINE?

The first question, then, is, Is professional photography on the decline?

At the very outset we are met with a difficulty here. How are we to determine this?

A very little consideration will show that individual evidence is of no use here. Brown, Jones, and Robinson may complain loudly that they do not have the same business by half that they once had, but this may only mean that the business has gone elsewhere. Take a further case

Suppose, for argument's sake, that the whole of the businesses in a locality have suffered; is it not possible that this is due to causes acting on the general prosperity of that individual locality, and not on the photographers only? We have really had no evidence whatever that professional photography is on the decline.

If we could determine the amount of capital invested in professional photography (the only sure test), I am very strongly of opinion that we would find that professional photography was never in a more flourishing condition. My personal observation leads me to believe that perhaps there may be *fewer* businesses in a flourishing way; but, on the other hand, look at the palatial premises reared on the most valuable sites by the favoured few!

I know it to be a fact that some of our modern studios turn over more money in a month than half a dozen average businesses of a dozen years ago would have done in a year.

In point of fact, photography, like every other business nowadays, requires capabilities not found in the herd. The day has been when the shutters could be put on and the door locked while the proprietor enjoyed a comfortable dinner at his own fireside; but it is so no longer. There are fortunes making yet, even in photography, by those who have the required capabilities, and the race is generally, if not always, to the swift, more so than ever in our day.

In not a few instances the falling off of trade is apparent, not real.

Dry plates, ready-sensitised paper, retouching given out, enlargements given to professional enlargers, reduce the hands in an establishment, and the bustle, perhaps also the profits, even where the trade is as good as ever. While I am ready to admit that business is not, as it once was, evenly distributed over the many, but rather conserved to the favoured few, I am decidedly of opinion that the total amount done is as great as ever, and the capital employed in proportion.

If this is so, it follows that the case against the amateur breaks down, at least so far as he has been supposed to injure professionals in general.

But may there not be many *individual* instances in which amateurs have injured the business of the professional? If this occurs to any extent, the question deserves discussion; and, in order to open it, let us admit, for argument's sake, that it does.

Do Amateurs Injure Professionals?

This brings us to the second question proposed for discussion, to what extent is an amateur justified in carrying on his sport to the hurt of the professional?

An amateur may be defined as "one who does for sport what another does as a means of livelihood." If this definition be fairly correct, it follows from this that the moment remuneration becomes the motive the individual has lost his amateur status. Whatever he becomes, he ceases to be an amateur.

The question, so far, is easily settled. Unfortunately, very few care what precise appellation they go under. If it were a mere matter of name nobody would be a whit the better or worse whether a man was entitled to call himself an amateur or no; but it is more than a mere matter of name. In whatever profession or trade, an amateur has certain privileges, and a professional certain responsibilities. It is manifestly unfair that any one posing as an amateur should enjoy all the privileges, together with a proportion of the emoluments, of the professional, however small, without sharing in the responsibilities.

I know there are many who think that they are entitled to make their expenses out of the thing, if nothing more. For my part, I don't see what right any one has to take up a pastime the expenses of which he cannot meet, and he certainly has no business to pose as one who can afford to spend his money this way when, in fact, it is not costing him a penny. I am imputing motives to no one; this is only my way of thinking.

Between the undoubted amateur, who pays for everything and gets in return only the sport, and the poor struggling labouring man who eks out a scanty livelihood by photographing the coalman's horse or the grocer's van of a Saturday afternoon, there are numberless degrees. The question to settle is not the amount of moral delinquency, but the essence of it in each case.

Professional photographers have done nothing for photography; it is not on this account that we would say, "Hands off!" The whole question is surrounded with difficulties.

It may be asked, "Because A and B determine to earn their bread *entirely* by photography, is that any reason why C should be debarred from *partially* earning his bread in this way?" If the amateur were stealing a march upon the professional by appropriating his inventions, there might be some reason for crying "out" on him, but it is a well-known fact that every invention and discovery in photography has been from the unselfish and enthusiastic amateur.

Much has been said about the generosity of the professional to the amateur. I have gotten much kindness from them, but I have never found them very free to communicate any of these little tit-bits of information discovered by themselves, nor do I blame them; it is not sport they are after, but bread, and in these days of competition one can't afford to burn the midnight oil and then make his discoveries common property. It is easy for the amateur to hurry his little inventions off to the journals; it will take no bite out of his mouth.

As you will see, I am taking up no hard-and-fast position, but rather saying what can be said on both sides. I sometimes feel inclined to ask why should professional photographers cry out so much against the amateur. Does every trade and profession not suffer just in the same way? In my own profession we every day see people put their lives into the hands of amateurs, generally with the very best results so far as the legitimate practitioner is concerned, for it means more work for him in the near future.

Professional Photography not on the Decline.

But the professial photographer himself is not over-particular. Does he not sometimes encroach on the picture-framer quite frequently? And it is just this class of man who is crying out against amateurs.

Having so far opened up the subject, I would make way for the discussion by giving the following opinions:—

Professional photography is not on the decline; there is more capital invested in it than ever.

To succeed nowadays money must be invested freely, the very best talent secured, and the very best business principles practised. All of the professionals engaged in the business now have not these requirements; therefore some of them are feeling the pinch.

The idea that amateurs are seriously affecting the professionals is laughable. Is there one in our large Society who knows any amateur doing work enough to damage any professional?

Admit that, at rare intervals, some poor devil picks up a job of a Saturday afternoon, and gets a shilling or two for it (and, personally, I know of not one such case), do any of you believe that this happens to any serious extent? Do you not rather think, with me, that the large businesses of the day are swamping the small, and that this is the *great* factor against them, not the amateurs?

So far as I am personally concerned, I hope I would do as I would be done by, but it is not always easy to determine whether or no any one is to be injured by certain actions. Professionals are apt to think that everything done by the amateur is lost to them, but they forget that much of the work done by the amateur, even where he degrades himself and sells his productions, would never otherwise be done at all.

Where an amateur takes a commission, where he knows the job *must* be done by the professional if he himself refuse, I suppose we are are at one in saying he acts meanly. "Live and let live" ought to be the motto with every one.

"When is an Amateur not an Amateur?"

During the summer that has passed I spent a fortnight in an obscure corner of the West Highlands. Receiving much kindness, I had a family group taken at the cottage door, and have since sent them one small copy in a frame. The gratitude of the simple country folks found expression in a gift to me of far greater value than the little picture I made them. Although I have not received money, I have received something which is its equivalent. Have I lost my amateur status? I certainly did not take the picture for my own sport, but deliberately for their benefit. Was this pure amateurism? Then, while I got no money, I certainly received remuneration in country produce. Am I still an amateur? I defrauded no professional.

The little clachan is thirty miles from a studio, and my host and hostess would have lived and died in all human probability, but for my visit, without having been photographed.

Those gentlemen who decry the amateur so strenuously have generally a curse or two for the quality of his work also. This, to my mind, is their salvation if it exists, for who would give the amateur good money for his vile productions when they can get so much better from the professional? Does the argument not seem to say that, bad as the amateur work is, it is at least as good as what we get from the professional, therefore we will go to him?

Let the professional turn out work such as he should do, and surely the amateur "trash" will have no charms for any one. I don't know if every amateur has the same experience as I have, but I knw that the portraits which I do of my friends always seem the work of a madman to them; this, mind you, when I have succeeded, in some measure, in doing something which seems to me original and good.

The work of the amateur and the work of the professional ought to be

on entirely different lines, with different aims and aspirations. There is not now, and never will be, competition between the amateur and the professional, let them say what they like. No one who takes to photography with presumably artistic tendencies in him will ever continue to sink his artistic perceptions by working to please the public taste unless he has to earn his bread by it, when, of course, one must produce what he can sell.

Those benighted individuals who are clamouring for a price for the amateur and another for the professional will succeed in demonstrating their ignorance of John Stuart Mill, but nothing more. A demand such as the amateur of our day can raise will be met, and that at prices current, neither more nor less. Those firms declining to supply the wants of the amateur at market prices just because he is an amateur will cause a rearrangement of business in which they will be out of it, nothing more. I should advise its being tried on a *small* scale to begin with. I deplore the want of business which many are complaining of, but, being an amateur, I do not take kindly to the remarks which appear from time to time in the photographic journals over the names of certain of the profession. The amateur has a just cause, or I have been particularly fortunate in my amateur photographic friends. J. K. TULLOCH, M.B.

COPYING OLD PORTRAITS.

[Anthony's Bulletin.]

THE copying of portraits, particularly portraits of deceased persons, is a lucrative branch of regular photographic business. Aside from the money consideration, it is also well worthy of attention from the humanitarian and historical standpoints. I believe the latter to be sufficiently well understood and admitted to require no further mention.

The expression "copying portraits" may be made to include the photographic treatment of vast varieties of pictorial matter. Supposing that the photographer was commissioned to copy a quantity of originals in the form of engravings, etchings, drawings or the like, the task would present no great difficulties from the photographic side. The chief thing to be seen to would be the condition in which the originals were. If the engravings had been kept flat, as in portfolios or frames, and were free from the yellow marks of mildew appearing in patches over the paper, everything would be as simple as possible. But when the plate paper on which the older-fashioned engravings were made shows these yellow spots, or, worse yet, the brown stain from cheap backboards in the frames, which are saturated with resinous material, there will be trouble. As a matter of course, the brown portions will appear much lighter in tint on the negative, and will have to be laboriously retouched so as to harmonise with the rest, if a presentable result is desired. If work of this kind is to be done by contract, a generous allowance should always be made for the retouching.

It will sometimes happen that a lot of engravings have become soiled by their faces coming into contact with one another without any tissue paper between. In this case the ink spreads or is transferred over from the one to the other, and the lighter portions become tawny and dirty looking. Now, nothing is easier than to clean such soiled engravings, and it should be done as follows: Take a quarter of a loaf of stale bread, and having cut off the hard crust with a sharp knife, wash the hands perfectly clean, make a ball of the crumb with a few drops of water, and work it about between the palms until it is perfectly smooth and has a consistence like stiff putty. Now, pull off a portion, and, having laid the engraving flat on a table in a good light, gently pass the bread-ball over it as nearly as possible in the direction of the lines of the drawing. The dirt and ink will all come off without in the least affecting the engraving, even in its most delicate portions, and the soiled high lights will again appear as pure and clean as when the picture first left the press. No grease of any sort must have touched the bread. Plain bread made without milk or shortening, and free from even a trace of butter, is what is wanted, and the ball must not be made too wet so as to cockle the engraving. If there are marks, however, that resist this mild treatment, recourse may be had to the indiarubber eraser. This, it must be borne in mind, is not free from danger, from the fact that the rubber actually removes a portion of the surface of the paper, so that very fine lines might easily be rubbed away if much pressure was laid on. Bread crumb is merely an absorbent of the superficial dirt and dust on the picture, and is not firm enough to remove any of the surface, even when hard rubbed. If indiarubber is employed, select the finest and softest obtainable, and cut it away to a blunt point. Also have a piece of clean, fine sand paper ready, and, after every few strokes of the rubber, work off the blackened portion on the tip by a few passes on the sand paper, which will leave a fresh surface for the next application.

Portraits on ordinary albumen paper vary in quality, and sometimes will do fairly well when copied. Supposing that the original is not too much faded, and has been kept clean, it will yield a tolerable negative if exposed upon in diffused light; and care should be taken that the negative be not forced to too great density, but left soft, so as to give a harmonious print. If the original has been much handled or carried about, the surface of the paper will be soiled and perhaps roughened. Such a print may be advantageously rubbed over with the lubricator used before burnishing, or with the so-called encaustic paste of wax and turpentine, which will clean the surface and brighten it up. A few passes through a rolling-press will be a good thing; but we do not advise that the ordinary burnisher be employed, as it gives too glossy a surface, and creates an inconvenient amount of reflected light when the print is set up before the copying camera.

If permission can be obtained from the owners, the following plan is a very good one to follow, though entailing some trouble:—Throw the print into luke-warm water until it leaves the card. Have a clean sheet of thin plate glass in readiness, and pass it under the print. Then bring the two out together, and, having seen that there are no air-bubbles present, wipe off the face of the glass, and make the copy immediately before the print has time to dry. The brilliancy of the wet print, and the fact of the surface of the picture being in optical contact with the glass, will do much toward making the copying easy and successful. It may be well to say, though, that very old prints, or those made on very thin paper, should not be subjected to this rather heroic proceeding.

A really good Daguerreotype gives an excellent copy, all that is necessary being to get it in the right light. The fineness of definition and chemical perfection of a good Daguerreotype image are unrivalled by any of the achievements of modern photography, and we may remind our readers that these qualities are so prized by certain scientists that they use the Daguerreotype for astronomical photography, to the exclusion of all other processes. But the average Daguerreotype portrait, which will be brought into the gallery to copy, is no such piece of perfection. As it would hardly do to attempt the negative through the covering glass, the operator must go through the rather ticklish operation of unmounting the portrait, and, if the surface be covered with the peculiar deposit that is apt to form on it, this may be removed as follows:—After a preliminary rinse under the tap, and draining, hold it as near the mouth as possible without scratching the picture with the beard, and cover the surface well with saliva. After allowing this to remain on a short time, rinse it off, and apply a very weak solution of cyanide of potassium (say, two or three grains to the ounce) for a moment, then wash again, and dry. It is the custom of some operators to apply the saliva directly to the picture as soon as it is unmounted. Singular to say, tobacco in the mouth has no bad effect. It is possible, though, to omit this unpleasant operation. In drying, the picture should be held by one corner with a pair of pliers, and very gently heated over a spirit lamp. When it begins to dry at the upper corner, take a full breath, and gently blow on the surface until the drying is complete. Any check in the drying will create an ineffaceable mark on the picture. The final wash should always be of distilled water.

None of this trouble will be had when handling ferrotypes, or old-fashioned ambrotypes. This latter form of picture—being in fact nothing more or less than a weak negative—may often be used as a negative, and thus made to yield a very fair positive or opalotype. It might be possible, by judicious working, to make a reproduced negative with rather more vigour than the original, and obtain passable paper prints from it. As we write, we remember a case where a very successful opalotype was thus made from the original ambrotype, to the unbounded satisfaction of the owner, who was not aware that such a thing could be accomplished by photography.

The difficulties of copying paintings in oil or water colours, formerly so great, have been materially lessened by the introduction of orthochromatic plates. But I can only regard this matter as being in an undeveloped state. If a number of paintings had to be photographed, there would be certain predominating colours in each, and it could not be expected that plates prepared from one and the same emulsion would yield equally perfect results on all. For those who can afford the time and not grudge a little labour, I should advise a trial with collodion emulsion, the plate being steeped in a solution of the orthochromatic dye purposely selected for the particular colour to be dealt with. The coloured screen might be used or not, as circumstances dictated. Any length of exposure could be given, and a few carefully conducted experiments of the kind would serve as a useful guide for future work. It is hardly necessary for me to remind practical photo-

graphers that portraits in oil present the most extreme varieties of tone and colour, and that, in order to secure the full benefit of the orthochromatic principle, some selection of the dye to correspond with the work in hand should be made.

Those whose business justifies the getting up of apparatus without special regard to the expense involved, will, of course, possess all necessary appliances for holding the original in position, and getting it to centre accurately on the ground glass; but to those who work in a small way, I should like to recommend a simple thing that has proved itself wonderfully useful to me. Having accurately measured the height of the window-sill in the workroom, I procured a board six feet in length, and wide enough to hold the camera, and adapted to *one end* of it two light cross legs, of a height just sufficient to make the board level when its other end was supported on the window-sill. Having taken care to set the legs on at a perfect right angle, I could turn the whole thing upside down, and by resting a board holding the engraving to be copied against the upright legs, and setting the camera in position, perfect rectilinearity of line in the copy followed as a matter of course. The whole affair, when used in this way, was supported on a firm table. When standing in its original position, with the free end on the window-sill, I used it for holding the cameras when making lantern slides by daylight, and, when printing, to hold the frames before and after exposure. Being perfectly rigid and steady, it answered very well for trimming prints upon, if the other tables in the workroom happened to be crowded. Finally, when not in use, it could be stowed away in an odd corner, with its six-foot long upright against the wall, occupying almost no space at all. To any amateurs who may be compelled to work in small apartments, I can recommend this simple article as being very handy and very cheap.

The photographic work in copying is simplicity itself. The lens ought always to be focussed with a large opening so that everything is distinctly seen, and then a small stop put in to distribute the definition evenly. The exposure should be rather full, so as to secure all the detail in the shadows, and the development must be stopped before the lights are overdone, even if the negative comes out thin and flat in consequence. If this happens, the plate must be strengthened after fixing by any of the well-known means. Two qualities should always be sought for in negative copies—the one, freedom from granularity, caused by light striking the original at a wrong angle; and the other, softness and detail in the negative rather than strength and harshness.

ELLERSLIE WALLACE.

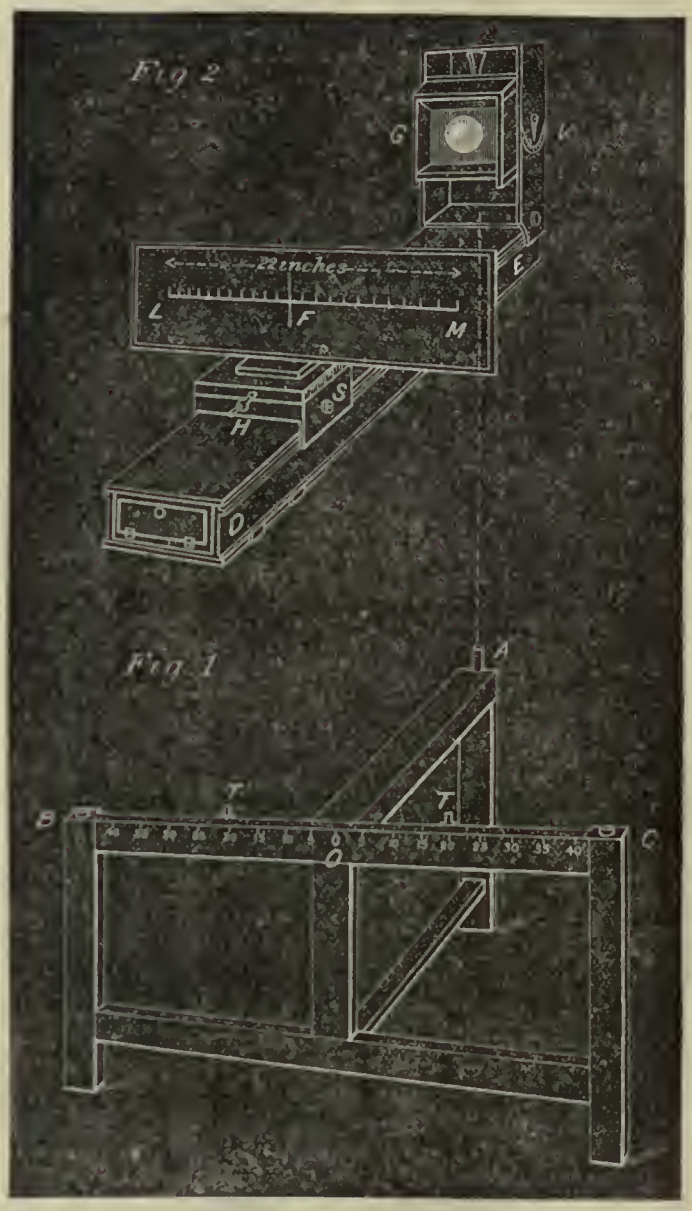
ON THE METHOD OF EXAMINATION OF PHOTOGRAPHIC LENSES AT THE KEW OBSERVATORY.*

8. *Flare Spot.*

THE defect known as *flare spot* consists of a bright spot or patch of light being formed in the centre of the field. To detect it, the lens is placed in an ordinary camera, which should be pointed at the sky; if the ground glass is brought to the principal focus, the flare spot is then readily visible.

For tests Nos. 9 to 16 an apparatus designed by myself, and which I have called the "testing camera," is used. It is neither an expensive nor an elaborate contrivance, and there can be no doubt that if more money had been expended a more perfect machine could have been made. Until a system of this sort has been in regular use for some time, and until it has stood the fire of criticism, experience shows, we think, that the apparatus employed is apt to be little more than a good working model of what it will become by future developments; but improvements would in this instance probably tend to increased rapidity rather than to increased accuracy, for the results obtained are now quite accurate enough for all practical purposes. Even now alterations are under consideration, such as the substitution of a sliding eyepiece on a graduated bar for the long sheet of ground glass. For the above-mentioned reasons, and because much expenditure could not be justified until it was certain that lenses would be sent for examination in considerable numbers, the Kew Committee raised no objection to the somewhat make-shift appearance of the apparatus.

The general idea of the testing camera is extremely simple, but the name perhaps is hardly a happy one, as there is no "camera" or chamber about it. Except for the absence of bellows, it may be said to consist of the essentials of an ordinary camera, which is capable of being revolved horizontally about a vertical axis passing through the lens; though it must be confessed that this description gives no idea of its appearance. The three-legged stool or bench, seen in fig. 1, represents the legs of the camera, and fig. 2 shows the apparatus that takes the place of the body; G. is the lens-holder, and LM the ground glass, both of which are capable of independent movement backward and forwards on the hollow wooden beam DE, called the "swinging beam." There is a conical brass cap or pivot, not shown in the sketch, under the upper plank of the swinging beam, underneath where the lens-holder G is shown in the sketch. The whole of the apparatus shown in fig. 2 is placed on



FIGS. 1 AND 2.

the top of the three-legged stool, the round-headed iron pin (A) passing loosely through a hole in the lower plank of the swinging beam, and fitting into the conical brass cap or pivot. The swinging beam, being thus supported by the pin A and by the long arm BC of the stool, is capable of being revolved around A as a centre. On the ground glass is engraved a horizontal line, which is accurately divided into fiftieths of an inch; this line passes through the centre of the ground glass (or through the point where the perpendicular from the lens-holder cuts the glass), and is also parallel to BC, the top of the stool on which the swinging beam slides, when the camera is in position; thus the image of an object will appear to run along the scale as the swinging bar is moved from side to side. The ground glass can be brought approximately into focus by means of the already-mentioned movement to and fro on the swinging beam, but for accurate adjustment a slow motion arrangement is attached to the movable part itself. The handle H gives the required motion, and there is a scale S, called the "focus scale," by means of which these small movements can be accurately measured. On the lens-holder there is a movement, corresponding to the swing-back of an ordinary camera

* Continued from page 713.

by which the lens can be made to revolve vertically round a horizontal axis, without, of course, any corresponding movement of the ground glass. There is a vertical arc, V, by means of which we can read off the vertical angles through which the lens is rotated. An arrangement is also supplied by means of which the lens can be moved backwards and forwards on the movable stand, thus allowing the position of the lens to be so adjusted that the horizontal axis can be made to pass through any point in its axis.

9. *Effective Aperture of Stops.*

Number engraved on stop.	Effective aperture. Inches.	*f*-number.	C.I. No.
No.	.....	.....	.....
No.	.....	.....	.....
No.	.....	.....	.....
No.	.....	.....	.....
No.	.....	.....	.....
No.	.....	.....	.....
No.	.....	.....	.....

The effective aperture of one or more of the various stops supplied with the lens is found by a well-known method. The image of a very distant object is first brought into focus on the ground glass of the testing camera; a collimator, which has itself been previously focussed on a distant object, may be used instead of the distant object; the ground glass is then taken out and exactly replaced by a tin plate with a small hole at the centre; this hole, which should be very small, will, therefore, be at the principal focus of the lens. The room being darkened, a gas burner is placed behind the small hole, and thus parallel rays, in the form of a cylinder, are made to issue from the lens towards the front. A piece of ground glass, with a graduated scale engraved on it, is now held in front of the lens, and the diameter of the illuminated disc, or section of the cylinder as seen on the glass is directly measured off as any stop is inserted in its place. Thus is found the effective aperture of the largest stop, as recorded in the Kew Certificate of Examination. The ratio of the effective aperture to the diameter is the same for all stops of the same lens, and the effective aperture of the other stops is either measured as above, or calculated from the ratio thus found. As the rays are parallel when emerging from the lens, it is evident that, if the stop is in front of all the, lenses, the effective aperture will be the same as the diameter of the stop itself

By imagining the path of the rays in the above experiment as being reversed, in which case the rays forming the cylinder are all brought to a focus on the plate, it is evident that the intensity of illumination of the plate at the centre, when focussed for distant objects, varies directly as the sectional area of the cylinder, and therefore as the square of the effective aperture as above measured. The intensity of illumination of the plate also varies inversely as the square of the distance from the point in the lens from which all the light may be supposed to emanate, that is from the nodal point of emergence. If we adopt as our definition of the principal focal length (f) of the lens the length between the principal focus and the nodal point of emergence, it is then evident that the square of the effective aperture divided by f^2 will be a measure of the illumination of the plate. In consequence of this fact, it has for a long time been customary to speak of the diameter of stops in terms of the ratios of their effective apertures to the focal length of the lens; for example, a lens having a stop with an effective aperture equal to one-tenth of its principal focal length is commonly spoken of as working with an intensity of f-10. But it has recently been found by photographers that it is practically useful to adopt a definite standard or unit of intensity of illumination in order that the different stops may be numbered in such a way as to readily indicate the different exposures required with each. Many systems of this kind have been considered—f-100, f-10, f-4, and f-$\sqrt{10}$, each having been at various times proposed as the basis of enumeration, the numbering of the stops sometimes increasing and sometimes diminishing as the necessary exposure increases. Each of these systems has met with considerable opposition from different quarters; but this is not the place to discuss their relative merits, more especially as in selecting one of them for the Kew certificates, we have been chiefly influenced by considering which has received the sanction of the most authoritative body, and which, therefore, stands the best chance of universal adoption. Judged by this standard, there can be no doubt that the recommendations of the International Photographic Congress of Paris of 1889, as endorsed by the Congress at Brussels, should be adhered to as far as possible.

The following system, which we have called the C.I. system, has therefore been adopted at Kew. The stop f-10, the effective aperture of which is one-tenth of the principal focal length of the lens, is called stop No. 1, and the exposure necessary for any subject with that stop is the unit of exposure for that subject. The other stops are numbered in the inverse ratio of the area of their effective apertures to the area of the effective aperture of stop No. 1. Thus stop No. 2 gives half the intensity of illumination of stop No. 1; and, in any case, to find the time of exposure necessary to produce the same result as with the unit of exposure with stop No. 1, we multiply that unit by the number of the stop in use. The practical rule to find the C.I. number of a stop is to divide the square of the principal focal length by 100 times the square of the diameter of the effective aperture of the stop. The principal focal length, which we require to know in order to calculate the numbering of the stops, is found by test No. 11.

The difficulty of introducing the C.I. numbering of stops will perhaps be greater in England than on the Continent, partly because, previous to the Paris Congress, the Photographic Society of Great Britain had given provisional support to another system based on f-4 as a unit. The Photographic Society has been waiting for the recently published reports of the Brussels Congress to reconsider this matter, and it may be hoped that they will join in the effort to get the C.I. system universally adopted, notwithstanding the inconvenience that must be severely felt at first by those who are therefore obliged to change their methods.

LEONARD DARWIN, Major R.E.

[*To be continued.*]

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
November 14 ...	Darlington	Trevelyan Hotel, Darlington.
,, 14 ...	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 14 ...	Lantern Society (Annual)	20, Hanover-square.
,, 14 ...	Norfolk and Norwich	Bell Hotel, Norwich.
,, 14 ...	North Middlesex	Jubilee Hall, Hornsey-road, N.
,, 14 ...	Richmond	Greyhound Hotel, Richmond.
,, 15 ...	Brixton and Clapham	376, Coldharbour-lane, Brixton.
,, 15 ...	Exeter	College Hall, South-street, Exeter.
,, 15 ...	Keighley and District	Mechanics' Institute, North-street.
,, 15 ...	North London	Wellington Hall, Islington, N.
,, 15 ...	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 15 ...	Southport	Shaftesbury-buildings, Easthank-st.
,, 16 ...	Brechin	14, St. Mary-street, Brechin.
,, 16 ...	Bury	Temperance Hall, Bury.
,, 16 ...	Hyde	
,, 16 ...	Manchester Camera Club	Victoria Hotel, Manchester.
,, 16 ...	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 16 ...	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 16 ...	Southsea	
,, 16 ...	West Surrey	St. Mark's Schools, Battersea-rise.
,, 17 ...	Birmingham	Lecture Room, Midland Institute.
,, 17 ..	Camera Club	Charing-cross-road, W.C.
,, 17 ...	Greenock	Museum Com. Room, Kelly-street.
,, 17 ...	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 17 ...	Oldham	The Lyceum, Union-street, Oldham.
,, 18 ...	Cardiff	
,, 18 ..	Holborn	
,, 18 ...	Leamington	Trinity Church Room, Morton-st.
,, 18 ...	Maidstone	"The Palace," Maidstone.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

NOVEMBER 8,—The President (Captain W. de W. Abney, C.B., F.R.S.) in the chair.

Messrs. Carpenter, Chaplin, Clulow, C. W. Gamble, Griffiths, and Dr. Grey were elected members of the Society, and a large number of nominations were read. Several presentations to the library were announced, as well as the purchase of a copy of *Sun Pictures in Scotland*, by the late Fox Talbot.

The HON. SECRETARY stated that the Lyonsdown Photographic Association (Barnet) had that day been admitted to affiliation of the Society.

ADDRESS BY THE PRESIDENT.

The PRESIDENT, in delivering an address, said that it was an innovation, or, rather, an experiment, inasmuch as it had not been done before, but it was the wish of the Council, and he thought that it had better be given then than at the annual meeting. The office he held was no mean one, and he could but recall that in the existence of the Society there were only four Presidents before him—Sir Charles Eastlake, 1854-5; Lord Chief Baron Pollock, 1855-1869; Mr. James Glaisher, who presided down to 1892, with the exception of a small break when volcanic eruptions were about, the chair being then filled by Mr. John Spiller. No small part of his (the President's) scientific life had been spent in the Society, to which he was elected in 1871. He had been editor of the Society's Journal for sixteen years, and had seen its laws twice revised. Those laws were again under revision, and when completed he thought the Society ought to be allowed to exist in peace for some time to come. They might

depend upon it that a working Society had little time for tinkering its laws. The Society chose its own Council, and he would say to the members, Trust the Council. The President remarked that it might be interesting to them if he read the names of those who formed the first and second councils, and said that the labours of those men still spoke to us. His wish was that in twenty-seven years to come, when some future President delivered his address, the work done by the present members of the Council would be as good as that of the men to whom he had referred. The Society could aspire to nothing higher than to help forward photography. They often heard that art owed nothing to science. The retort discourteous would be that science owed nothing to art. It was easier to pose as an artist than as a man of science before being found out. One of the main objects of their Society was to encourage the scientific aspects of photography, and he thought they could look back nearly thirty years with satisfaction from that point of view. It was a long road that had no turning or milestones. If there had been no turning, the road would have been a weary one, but the milestones made it less long. There had been no important advance in photography which had not been discussed by that Society, and, although it might be 1000 miles to perfection, one mile less made it 999. They, of course, would never reach that goal; but there were others that would succeed. There was no nobler aspiration than the search after truth, and photography was helping to an enormous extent in many problems. Remarking that one of the marvels of science was the action of light on sensitive surfaces, the President went on to briefly indicate the possible influence which recent physical, chemical, and mathematical science had on photography [this part of the address will appear in a future number], and concluded by remarking that no great advance would be made in photography unless theory was a little ahead of it. He thought the Society should take up theoretical subjects. He congratulated the Society on the exhibition. Some old names were missing from the catalogue, but he hoped to see them there on a future occasion. The Exhibition had been favourably noticed by the press with one exception. A critic had a free pen, and no one could find fault with the impersonality of a paper if he used it so. When an art critic was sent to criticise art, his opinion in such matters was supposed to be valuable; but one critic had expressed his opinion to a small extent on the pictures, and to a large extent on the Society. They accepted the criticism on the pictures with pleasure; and the other they could also accept because it had done no damage except to the gentleman who had penned it.

The President subsequently distributed the medals to the successful exhibitors at the recent Exhibition, Messrs. Karl Greger, R. Gay Wilkinson, W. Bedford, Colonel Gale, H. Yeo, Sawyer (Autotype Company), Hobson (Taylor, Taylor, & Hobson), being present to receive their awards, the President observing that he thought the Society could congratulate itself both on the Exhibition and the excellent way in which the Judges had executed their functions.

"Some Remarkable Properties of Silver and Gelatine."

In the absence of Mr. Howard Farmer, his brief communication on this subject was read by Mr. Chapman Jones, the Hon. Secretary. The first property drawn attention to was the catalytic action of finely divided silver in the presence of gelatine and bichromate of potash, the alteration of the bichromated salt in light reducing the gelatine to the insoluble chromated form, while the silver itself does not undergo any change. The simplest manner of observing the reaction was by placing some silver in a solution of ammonium bichromate; if the latter be of a strength of twenty per cent., the reaction was practically instantaneous. Silver bromide plates, if developed with ferrous oxalate, and plunged into a twenty per cent. solution of ammonium bichromate rendered the gelatine in contact with the reduced silver insoluble, and the images, after washing, presented the same relief as carbon prints immersed in water. The films could be squeegeed on to an insoluble surface, and developed with hot water. By heating the films, similarly reticulated surfaces are obtained on immersion in cold water. Thus they had the means of obtaining the high degree of sensitiveness of gelatino-bromide in conjunction with the effects of light on bichromated gelatine. In reference to the second property referred to, Mr. Farmer observed that, when many salts—notably the bichromates—are dissolved in gelatine, and the gelatine dried, the salts did not crystallise out, but remained in the gelatine. Dry gelatine retained sixteen per cent. of water at ordinary temperatures, and it may be heated and the water driven off. This solvent action of gelatine was quite distinct from the solvent action of water. Many other substances were readily taken up by dried gelatine—barium sulphate for instance, which could be emulsified in gelatine, and when the emulsion was dry remained in suspension, the film becoming perfectly transparent, like glass, molecular contact appearing materially to alter the physical properties of the film. With barium sulphate and other insoluble substances the effect of reticulation was most marked. Bichromated gelatine gives reticulation of a more or less greasy nature, but with barium, when the surface was plunged into cold water, the surface was quite free from greasiness.

Mr. T. Bolas said the paper opened up some new fields, and he would repeat the experiments.

Mr. T. Sebastian Davis, in regard to the transparency of the film containing barium, said the idea was almost associated with the transparency seen in the analogous case of silicate of potash in the ordinary manufacture of glass.

Mr. Chapman Jones asked whether it was a fact that nowadays in collotype printing nothing was added to the gelatine; formerly he understood that silver bromide was sometimes present.

Mr. J. Traill Taylor, speaking of one American collotyper who produced results of great excellence, said that in his case nothing was added to the gelatine.

The President observed that Mr. Warnerke several years ago took out a patent on the basis of gelatine becoming insoluble when the plate was developed with pyro. There were a good many possibilities in the use of celluloid films, and doubtless good work could be done with bichromated potash in connection with a silver salt. At Chatham last year he was able to show that printing blocks could be produced on the same principle. He was quite certain that if the gelatine film was more experimented with there were no end of possibilities which would open in photographic printing. The paper was not altogether new to him, as he had experimented on the same lines, though he was not certain about the solubility of barium sulphate. He recollected in the old days that they had a process—the Eberneum—in which gelatine and oxide of zinc gave a matt opal-like surface, which was very pleasing to look through. He had tried the same thing with sulphate of barium, and got the same result as recorded by Mr. Farmer.

The meeting then adjourned.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

November 3,—Mr. G. W. Atkins in the chair.

Messrs. Grundy and Lorrimer were elected members.

Action of the Red Rays on Exposed Sensitive Surfaces.

Mr. A. Haddon, in drawing attention to Messrs. Bolas and Debenham's experiments with regard to the effect of red light upon a plate of haloid salt of silver that had already been exposed to light, said that an objection had been raised to the experiment in that the filtering media were not such as to allow the pure red rays only to fall on the plate. He therefore thought it worth while to make a few experiments, using instead of glass the spectrum with an electric light and a bisulphide of carbon prism. He exposed a piece of gelatino bromide paper to the light of a paraffin lamp for three seconds, another for five, and a third for ten, the three pieces being then exposed in succession to the action of the spectrum. During the exposure the light was turned on and off, the spectrum at the upper part only being allowed to act for a second. In the second case paper was exposed for six, eighteen, and thirty seconds to the paraffin light, and, on development, no difference could be discovered between the portions that had simply received exposure to the white light and those that had been exposed to red plus white. Red light, in fact, had neither undone nor increased the density of the deposit where it had acted. A similar experiment on plates yielded the same result. He had also exposed gelatino-chloride paper to the pure electric light, when it discoloured over the whole surface. He then exposed it to the action of the spectrum for ten minutes, at the end of which time there was a distinct difference in colour where the red light had fallen. Was this a chemical or physical change? In order to put this to the test he fixed one half and fixed and toned the other, and it was then impossible to see any difference between that portion where the red light had fallen and altered the colour and where it had not. A second piece of gelatino-chloride paper was next taken, and before being exposed to the action of the spectrum one-half only was exposed to the light of the arc lamp. The spectrum was then allowed to act on a considerable portion of the paper, and the other half to the bare light. Where the red light acted there was a marked change in the colour of the paper itself, which showed that there might be a physical change. He, however, doubted if any chemical change took place, as, when fixed, it could be seen that the margin of the paper appeared exactly the same where the red end of the spectrum fell.

Mr. W. P. Dando stated that he had been much mystified by obtaining different colours in lantern slides made by reduction, a light from a lantern through coloured glass being allowed to traverse that passing through the negative.

Mr. W. Bedford inquired whether, if Captain Abney's view that the action of the red rays is an oxidising one was correct, that would effect Mr. Haddon's theory?

Mr. Haddon replied that, on fixation, the same effect was obtained.

The Relative Rapidity of Different Printing-out Papers.

A communication from Mr. B. Foulks-Winks, treating of this subject, was read by the Honorary Secretary. It described experiments (the results being shown) of exposing slips of the various commercial printing papers under a negative to good diffused daylight, each strip having twelve different exposures, ranging from two to twenty-four minutes. The results of the experiments, according to the author, showed that platinotype was quickest, albumen next, gelatino-chloride next, and the ferro-prussiate slowest. Incidentally, Mr. Foulks-Winks mentioned the following toning bath for gelatino-chloride papers which he had arrived at after some experiments:—

Potassium sulphocyanide	1 drachm.
Common salt	6 drachms.
Distilled water (warm)	60 ounces.

When used add eight to ten grains of gold chloride. The bath is ready for use at once, the prints being put into it without previous washing.

Mr. W. E. Debenham pointed out that identical exposures instead of exposures proportionate to the speeds of the papers had been given. He suggested the use of scales involving the use of varying thicknesses of paper so that a geometrical increase could be obtained. The experiments did not justify Mr. Foulks-Winks's conclusions as to the gradations obtained.

Mr. E. J. Wall referred to some experiments of his own which he had undertaken with a similar object as Mr. Foulks-Winks, which he had not had time to complete. He, however, did not agree with the latter that albumen was quicker than gelatino-chloride.

Mr. J. S. Teape asked if as regular results could be obtained with gelatino-chloride as with albumen? He could not get that regularity.

Mr. A. Mackie had got regularity of results with gelatino-chloride, but only one tone.

After further discussion the meeting closed.

Hackney Photographic Society.—November 1, Mr. J. O. Grant in the chair.—A question was asked as to whether Ilford lantern plate (black tones) was a chloride or bromide plate. Mr. Beckett said it was a bromide. Mr. Wilks was nominated. Mr. Wise asked which was the best way to use amidol. Mr. R. Beckett advised using it dry. Mr. Carpenter then read a paper and gave a demonstration on *Lantern Slide Making*. He said a very great point was to get purity in the whites. He covered about one-eighth of an inch of rebate with black paper so as to detect fog. His own formula was:—Eikonogen

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one quarter of an ounce; carbonate of potash, one quarter of an ounce; bromide of potassium, five grains; sulphite of soda, one ounce; boiling water, to ten ounces. Allow to cool. He generally diluted it with equal weight of water For warm toues he preferred pyro, and mentioned the ten per cent. formula given by Thomas. He advised plenty of good yellow light, and objected to intensification. Some lantern plates of Thomas's were then developed. Mr. GOSLING asked whether chloride plates could be satisfactorily developed with pyro. The HON. SECRETARY said he had done some.

Kensington and Bayswater Photographic Society.—November 7, Mr. Seales presided.—Mr. G. BURSNELL gave a demonstration on *The Platinum Toning of Silver Prints.* He clearly explained the difference between a print on platinotype paper and silver paper toned with platinum, the former consisting of platinum only, and the latter, however well the touing may have been effected, of an alloy of silver and platinum. He claimed that a platinum-toned print will keep longer than a gold-toned one, that in toning more of the silver is replaced than in toning with gold, and that the platinum bath will keep almost indefinitely. The bath he has found to work best is one composed of chloroplatinite of potassium, one grain; citric acid, ten grains; water, four ounces. This is an improvement over the old bath, which contained nitric acid; this last, even when diluted, having a more or less injurious effect on the gelatine. It is necessary that all toning baths of platinum should be acid. If a warm tone is desired add ten more grains of citric acid, and dilute to eight ounces of water. In printing for warm tones it is necessary to over-print more than for black tones. The fixing bath should be made slightly alkaline with ammonia. Mr. Bursnell proceeded to give his formulæ and method of preparing a paper specially suited to platinum toning. Plain Saxe paper should be obtained and first salted with the following solution:—Nelson's No. 1 gelatine, twelve grains; water, one ounce. When dissolved, add four grains of chloride of ammonium and two drachms of negative varnish. The paper should be hung up to dry, and then sensitised with the following solution:—Citric acid, fifty grains; nitrate of silver, two drachms; water, two ounces.

Putney Photographic Society.—October 24, Special Meeting. Dr. Sheppard in the chair.—Dr. Jeserich's paper on *Photography Applied to the Detection of Crime* was read by Dr. Farrar, and was illustrated by a series of lantern slides. A series of lantern slides from Australia, South Africa, and India was then shown. In addition to a high standard of technical excellence the slides had the advantage of representing views of scenery and life quite new to many of those present. The paper and slides were lent by the Central Committee of the Affiliated Societies of Great Britain, and are part of a programme provided for the use of those who have joined the Affiliation. The programme, which is of a varied character, will be found an invaluable help to Secretaries in filling up their cards of fixtures, and will be a practical inducement to other Societies to join the Affiliation.

Richmond Camera Club.—October 31, the President in the chair.—Mr. Ramsay showed Middlemiss's frame for printing slides by contact from part of any sized negative—a very simple and useful adjunct to the dark room. Mr. J. D. Gibson brought some slides which he had made on chloride plates, following the formula, &c., as demonstrated at the previous meeting. The slides were very patchy, and many of them too red in colour. He wanted to know the cause of the patchiness. Mr. CEMBRANO thought that the magnesium must have been held too close to the negative, and not moved about during exposure, thus causing uneven illumination. The subject for discussion, *Preparing Work for Exhibition*, was opened by Mr. P. ENNIS, who said that, foremost of all, the quality of the work must be the very best, and he emphasised the necessity of being original in one's style. Most workers left the printing and mounting of their exhibition work for the last moment, which was certainly not always conducive of the best results. He therefore recommended that one should start early preparing one's exhibits. A great deal of care was necessary in suitably mounting and framing, as quite a number of prints were often spoilt by unsuitable framing. Mr. WILLIAMS thought the whole question lay in a nutshell—first get a good negative, and then a good print. Mr. RAMSAY added that exhibits were often too much prepared; in other words, that too much hand work was put on them. Mr. ST. JOHN HUNT inquired which would be the best kind of frame to have. Mr. CEMBRANO replied that the frame should be simple, and that it should harmonise with the print. The object of the frame was to separate the picture from the surroundings, indeed, it might be called the boundary line of the picture. It was a great mistake to have much gold in a frame for a photograph. It was fatal to use a moul ding which, by its richness or colour, should attract the eyes before the picture was seen or thought of. Mr. ALABASTER showed a frame he had sent to an exhibition. He thought that the mounts should be made to suit the prints. He preferred toned mounts. Mr. GIBSON remarked that it was a difficult thing to find suitably toned mounts. Mr. SUCH suggested that the size and shape of the frames should be considered. He believed that some sizes had a better chance of being hung because they fitted better. He further remarked that "hangers" should endeavour to harmonise the colours of the frames as well as the tones of the prints on the walls of an exhibition. The PRESIDENT read a question which had been put by one of the members: "A negative having been imperfectly washed and put away, a mouldy deposit appears on the film after a few months. This deposit seems insoluble in water, the plate having been soaked for three days without result. How can it be cleared?" Mr. WILLIAMS advised soaking in hot water. Mr. ST. JOHN HUNT suggested rubbing the film with cotton wool. Mr. HARRIS doubted the efficiency of this treatment, as he had been unable to remove the deposit with a sponge. Mr. CEMBRANO thought that resoaking in hypo and then washiag thoroughly might answer.

West Surrey Photographic Society.—November 2, Mr. J. L. Lyell in the chair.—The subject of the evening was a paper by Mr. A. R. DRESSER, entitled *Hints on Hand Cameras.* Mr. Dresser intimated that, in his opinion, a wide-angle leus was the one to use for hand-camera work, and the camera should be one with dark slides, and not one of a magazine pattern. In concluding his remarks, Mr. Dresser said that he hoped that his hearers would not at any time bring discredit upon hand-camera work by "snap-shotting" persons under conditions which might cause unpleasantness, as many were very apt to do. An exhibition of lantern slides by Mr. Dresser was then given, some very fine sea studies, and his popular *Wild West* series being shown. A discussion followed.

North Surrey Photographic Society.—The Exhibition of the work of members and the competition for the Whitby Prize of a guinea each for the two best sets of six prints, and the Society's certificate for the set next in order of merit, were held at the last meeting on Tuesday, the 1st inst. There were sixteen entries for the competition, and the prints sent in with those for exhibition only made quite an imposing show. The competition was very keen the result of the judging showing only a difference of five marks between the first and third best sets. Mr. Lewis Wolff, under the *nom-de-plume* of "Achromatic," was awarded the first prize; Mr. H. Senier ("Columbia") the second; and Mr. W. Rouch ("Pyro") the certificate. The six prints shown by Mr. Wolff were bromide enlargements of church interiors and village scenes; those by Mr. Senier, 5×4 prints on bromide and Eastman's Solio paper, landscapes and interiors, the best being the *Banqueting Room, Haddon Hall;* and those by Mr. Rouch, bromide enlargements and marine and forest scenes. Taking the exhibits as a whole, they reflected the greatest credit upon the members, and proved that the idea to hold the combined Competition and Exhibition was fully warranted. It may be remarked that ordinary albumen prints were conspicuous by their absence, eight-tenths of the exhibits being either platinotype or bromide. Among the pictures sent in for exhibition only those by Mr. T. J. Bright were universally admired, his *View from London Bridge* and *A Pastoral Scene in Essex* being of rare merit. By the courtesy of the Committee of the West Norwood Constitutional Club, in whose rooms the Society holds its meetings, the exhibits were allowed to remain on view for a week, and many friends of the members and others interested in the art of photography have availed themselves of the opportunity thus afforded.

Blackheath Camera Club.—November 1, Mr. J. T. Field in the chair.—A lecture and demonstration on the *The Eastman Company's Products* was given by Mr. A. C. BALDWIN. The lecturer described the roll-holder and the various kinds of Kodaks, and then gave a description of the method of manufacturing celluloid films. The factory is fitted with twelve glass-topped tables, each eighty feet long and forty-one inches wide. These are coated with liquid celluloid by means of a machine, which travels the whole length of the tables, running on steel rails at the sides, each being drawn along by endless chains, worked by an electric motor. The coat of celluloid is next dried by means of fans, and then coated with the sensitive emulsion, which is spread in the same manner as the celluloid, but at a slower rate. When the emulsion is dry the film is stripped from the tables, and, at the same time, wound upon a large spool, from which it is rewound on to another similar one, passing in the mean time over a table of ruby glass, lighted from the under side by an electric lamp. During its progress it is carefully examined, any defective portions being cut out or marked. After this it is rewound on to a series of small spools, being slit by knives during the process. Each of these small spools, of course, contains eighty feet of film of the width of the spool, and this is again rewound, in the proper lengths required for certain numbers of exposures, on to the spools that are used in the roll-holders. After mentioning bromide paper, Mr. Baldwin spoke of the gelatino-chloride paper made by this firm, and called Solio paper. He toned two batches of prints, one in the combined toning and fixing bath, and the other in the sulphocyanide bath, giving some valuable hints while doing so. With regard to the depth of printing, if the prints are to be toned in a sulphocyanide bath, they should not be printed so deeply as for the combined bath, while for the latter they should be rather less deeply printed than for any other bath, such as borax. When toned and fixed in separate baths, an alum bath is necessary between. If prints are to be glazed they should be printed deeper than for a matt surface. Squeegeeing on mat, surface celluloid is recommended for matt finish, and on glass or ferrotypt plate for glazed surface. In the combined toning and fixing bath the fixing takes place first, and is complete in about two minutes; therefore, by the time the required tone is obtained, the prints are sure to be properly fixed. They should be toned face downwards in this bath. The sulphocyanide bath must be freshly made from pure chemicals, and with this very fine purple tones can be obtained, the combined bath only giving warm tones. The prints must be thoroughly and quickly washed; excessive washing destroys the gelatine. The printing frames should be filled in subdued light or in the dark room, and should be backed with waterproof paper. To mount prints that have been squeegeed on to a support of any kind, apply a thin solution of Scotch glue to the back with a piece of flannel when print is nearly dry. When quite dry, strip off print, damp mount, and lay print down. When waterproof backing of any description is applied to a print, it must not be done until print is nearly dry, as otherwise the moisture will be unable to evaporate.

Croydon Camera Club.—November 7, the President in the chair.—Mr. CHARLES HUSSEY gave a finished and comprehensive paper on *Stereoscopic Photography*, in the course of which he dwelt on the charms and pleasures of this form of view making. The lecture, which was illustrated by a number of cameras, shutters, slides, and, of course, a stereoscope, was an admirable *exposé* of the subject, and, relieved by certain humorous allusions to the failings of photographic extremists, proved highly enjoyable. The lecturer also explained how, by means of a newly devised printing frame of his own invention, stereoscopic transparency positives could be printed by contact without necessitating any cutting of the glass and subsequent rejoining.

Croydon Microscopical and Natural History Club (Photographic Section).—November 4, Mr. Sparrow in the chair.—The attention of those present was drawn to the annual *soirée* of the Club to be held on the 23rd inst. The evening was devoted to a discussion on *Hand Cameras, the Practical Advantages and Defects of Various Systems.* For purely hand-camera work, such as street scenes, the type known as the "Magazine," with a lens of short focus, four and a quarter to five inches, was considered the most convenient, whilst for general work a camera with plateholders and a longer-focus leus was preferred. The CHAIRMAN, in the course of his remarks, described a novel form of plateholder he had used for several seasons constructed from the design of Mr. Sargeant. The shutter, instead of sliding out, was hinged and laid down on the bottom of the camera, the opening and shutting being effected by a small lever outside. The advantages claimed were: that it could be made

lighter and more compact than the ordinary form of dark slide, that it could be manipulated quicker, that no light could reach the plate when in the camera, as the form of construction allowed it to be entirely closed in. It was, however, not possible to use a lens of short focus, as the lens front could not be brought up sufficiently near.

Bath Photographic Society.—October 26, Mr. Austin J. King (President) in the chair, when a paper was read by Mr. GEORGE NORMAN, entitled, *The Camera as an Aid to Archæology.*—The lecturer said his special object that evening was to show the use of the camera in making permanent record of the forms of ancient buildings, many of which were fast disappearing from the land. For this purpose there were exhibited upon the screen pictures of Irish architecture from the earliest to mediæval times, mostly from the lecturer's own photographs, taken at meetings of the Royal Society of Antiquaries of Ireland, commencing with the primitive lake dwellings and underground caves, and passing on to the beehive cells and oratories. He then described the various forms of the early Christian churches, which reached their highest development in Cormac's Chapel at Cashel, with its barrel vault and high-pitched roof of stone, and concluded with a series of illustrations of mediæval abbeys and cathedrals. The following was communicated to the Society:—"Lacock Abbey, Chippenham, October 16. I think it may be of interest to you to know that, about a month ago, I found two *dated* specimens of very early photography. The first is a very minute camera picture of an oriel window in the south gallery of Lacock Abbey, which is glazed with diamond panes. It is evidently taken from the inside, looking outwards towards the south. This photograph is of a pale violet colour, and is mounted on a piece of black paper to set it off, and that again is mounted on a piece of white writing-paper, on which is the following memorandum in my father's handwriting:—'Latticed window, with the camera obscura, August, 1835. When first made, the squares of glass, about 200 in number, could be counted with the help of a lens. The panes are still quite distinct, and could probably be counted without much difficulty. The other specimen is a photograph of a plant, taken, no doubt, from a dried specimen by application. It is dated February 6, 1839. Both these photographs must have been fixed with salt. I have many other specimens that would be of about the same period, but these are the only dated ones that I have yet found. Signed, C. H. TALBOT, Lacock Abbey. To W. M. Ashman Hon. Secretary, Bath Photographic Society."

Gosport Photographic Society.—November 3.—A well-attended meeting of amateur photographers was held here on Thursday night, when those present unanimously resolved themselves into a Society, hereafter to be known as the Gosport Photographic Society. *President:* the Rev. — Matthew.—*Vice-Presidents:* Messrs. R. E. Froude, T. E. Williams, and George Churcher.—*Council:* Messrs. H. Fisher, S. Morrish, E. Tucker, R. E. Green, Moss, and Misselbrook.—*Treasurer*, Mr. W. R. Smith.—*Hon. Secretary:* Mr. Charles H. Wright, 47, High-street, Gosport. The Society will hold its meetings in the commodious studio of Mr. James Eltringham, 46, High-street, on the first and third Tuesdays of the month until further notice, these premises having been adopted as the Society's headquarters. Conveniently arranged reading and dark rooms are at the disposal of the members. On Tuesday, the 15th inst., the President will deliver the inaugural address, to be followed by an exhibition of members' lantern slides by the aid of the limelight. Classes for beginners are in course of construction, and will be duly announced. The Secretary will be pleased to receive the names of those wishing to join. The subscription is 2*s.* 6*d.* per quarter.

Huddersfield Photographic Society.—The fourth Annual General Meeting of the above Society was held on Thursday, November 3, Surgeon-Major Foster (President) in the chair. The SECRETARY read the report and balance-sheet, the latter showing a balance in hand of 1*l.* 6*s.* 3½*d.* as against 1*l.* 17*s.* 7½*d.* on the other side last year. Mr. CLARKE then proposed the amalgamation of the Society with that of the Naturalists' Society, which, after some discussion, was carried.

Rotherham Photographic Society.—November 1, Dr. Baldwin (President) in the chair.—In view of the lantern season it was decided to form representative collection of slides of members, and to make the selection at the December meeting.

Scarborough Photographic Society.—A photographic society has recently been formed at Scarborough, with the Rev. W. T. Reeder as President, and Mr. Todd as Secretary, Mr. J. H. Rowntree as Treasurer, and the committee were chosen as follows:—Miss Augusta Woodall, Miss McCallum, Dr. Monk, Mr. J. Whitfield, Mr. Northorp, and Mr. H. Hill. The hon. Secretary, Mr. N. Todd, resides at 15, Victoria-road, and he will be glad to give any information desired, and to receive applications for membership from both ladies and gentlemen who may be anxious to help forward this Society.

Sheffield Photographic Society.—November 1st, Mr. R. J. Taylor in the chair.—The question of a Dark Room was brought before the members, when after a very heated discussion it was resolved to postpone the matter until next meeting and decide by ballot. After which a series of lantern slides was passed through the lantern by Messrs. Furness, Hibbert, Camp, and Bromley, showing the effects gained by the different developers now in use amongst photographers. Mr. J. W. Charlesworth operated the lantern.

South Manchester Photographic Society.—October 31, Mr. W. Linnel presiding.—Messrs. Hutton, Macbeth, and Wade were elected members. Mr. Lawson, of Newton-le-Willows, exhibited a new saturator invented by himself. The instrument in its present form can be placed inside the body of the lantern, as the nipple and lime-holder form part of the saturator. It is intended to burn the ordinary commercial benzoline, thus doing away with hydrogen, an oxygen bottle being alone required. Among the advantages claimed for it are its perfect safety in use, and that a more brilliant light can be obtained than with any other limelight apparatus with either one or two jets. Mr. WADE read a paper on the *Making of a Lantern Slide*, in which he gave an account of his method of making them. He said a lantern transparency required the greatest technical skill, but, when obtained, the beauty of the picture was much enhanced, and when thrown on the screen usually called forth expressions of the warmest admiration. The lecturer proceeded to give an account of the various ways by which a lantern transparency could be produced, the best negative for this work being one "full of detail, rather thin, and clear." He considered the gelatino-bromide plates the best for general use, as capable of giving a great range of tones, from black to red, transparent shadows, delicate half-tones, and as being very free from technical defects. A very thin negative is better printed on a gelatino-chloride plate. With regard to the diversity of opinion as to the best developers, he thought all developers were good if you only knew how to use them—that was the chief point. The lecture concluded with a practical demonstration, several slides being exposed and developed by Mr. Wade.

Border Amateur Photographic Association.—This newly formed Society held its first meeting at its head-quarters, Galashiels, on Friday evening, November 4. The Rev. W. Burnet Thomson, M.A., who has been appointed President, occupied the chair, and, as a formal opening of the new body, delivered an address on *The Rise and Progress of Photography*, in which he dwelt strongly upon the vast extension of its uses in all departments of life, showing there were few sections of active thought and work, both in science and art, which were not much indebted to its power of accurate recordation, in addition to its ministering to the pleasures of those who only pursued it as a pleasant hobby, or the accompaniment of a holiday ramble. At the close he was thanked for his address.

Edinburgh Photographic Society.—November 4, Mr. H. L. Blanc, A.R.S.A. (President), in the chair.—Mr. J. M. TURNBULL brought before the meeting his experiences with "amidol" as a developer, specimens of which had been distributed previously. He stated, after a prolonged and exhaustive trial, he did not find it come up to the high degree of merit claimed for it. The resulting negatives were of a thin character, and wanting in the best qualities of a good plate. The keeping quality also of the new claimant was not, or rather had not in his hands proved, a success. A few negatives and prints from them were exhibited in proof that the results scarcely equalled those obtained from other well-known developers. Eleven new members were elected. The reports of the Secretary and Treasurer were submitted, the former drawing attention to the steady onward progress of the Society and its increasing popularity. The number of members at the close of the session was stated as 392. Reference was made to the events of the past year, notably the aquisition of the handsome new apartments with dark room specially fitted, also to the very successful meetings of the Photographic Convention. The finances of the Society showed no falling off, a good balance remaining after meeting all general charges as well as the special charges incident to the new rooms. The election for new office-bearers to succeed those retiring by demission and rotation was next proceeded with. Mr. ANDERSON expressed his own and the members' regret that Mr. Blanc, their present President, had found it necessary to demit the office owing to pressure of engagements in his profession, and he hoped that even yet Mr. Blanc would consent to remain in the office in which he had been able to do so much in forwarding the Society's interest, and he moved accordingly. The retiring PRESIDENT stated that he was much touched and highly gratified by the warm display of good feeling and by the flattering compliments of his fellow-members, for which he tendered his warmest thanks, but he craved to be allowed to adhere to his resolution, and desired to propose as his successor Mr. John Moffatt, who, being duly seconded, was unanimously appointed. The following gentlemen were then appointed:—*Vice-Presidents:* Messrs. Alexander Ayton, jun., and J. C. Oliphant.—*Librarian:* Mr. Charles Fraser.—*Treasurer:* Mr. James McGlashan.—*Secretary:* Mr. J. Farclay; and, to fill the vacant memberships of Council, Messrs. Bashford, Hawks, and Blanc.

Nelson Camera Club (Nelson, N.Z.)—June 22, Annual Meeting.—The report showed that the finances were in a satisfactory condition, and that the membership had increased to eight honorary and thirty-six ordinary members. The President referred to the loss the Club had sustained by the removal of its late Secretary, Mr. F. W. MacLean, from the district, and urged members to increased efforts. During the session 1891-92, the usual monthly meetings have been well attended, and the work put in for the monthly competitions has shown that the interest in the Club has in no way abated. The annual exhibition was held on September 3, 4, and 5, 1891, and was an entire success. Between 600 and 700 pictures were on view, and were much admired. On former occasions admission had been free, but this time it was decided to make a small charge, notwithstanding which the hall was well filled each afternoon, and crowded during the evenings. On the first evening the President gave demonstrations of platinotype printing and of flashlight photography, which were attended to with much interest. The second and third evenings, lantern exhibitions of members' slides were given. This being a new departure, and the slides being principally of local interest, much appreciation was expressed by the large audiences. Mr. F. W. Holland was the exhibitor. In December, 1891, a contribution of fifty frames of photographs was sent to the combined exhibition of the Otago Art Society and the Dunedin Photographic Society, and met with much commendation from the local press, and from the visitors to the exhibition.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 19,531.—"Improvements in or connected with the Production of Sepia or like coloured Photographic Pictures, and Sensitised Paper Films and other media therefor." H. J. SHAWCROSS.—*Dated October* 31, 1892.

No. 19,581.—"Improvements in or relating to the Regulation of Photographic Shutters." J. T. CLARKE.—*Dated November* 1, 1892.

No. 19,593.—"The Universal Lantern-slide Printing Frame." J. ASHFORD and W. TYLAR.—*Dated November* 1, 1892.

No. 19,629.—"Improvements in Apparatus for exposing Photographic Films." Communicated by G. D. Milburn. A. J. BOULT.—*Dated November* 1 1892.

No. 19,636.—"Improvements in or relating to Roll-holders for Photographic Films." W. H. WALKER.—*Dated November* 1, 1892.

No. 19,863.—"The 'Tidy' Negative and Plate Rack." F. DERENHAM.—*Dated November* 4, 1892.

SPECIFICATIONS PUBLISHED.

1891.

No. 17,860.—"Photographic Dry Plates." NIEVSKY.

1892.

No. 716.—"Photographic Cameras." PRIDE.

No. 15,447.—"Photographic Cameras." STEGEMANN.

No. 16,264.—"Photograph Albums." ALBERT.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

MATT P.O.P. PRINTS.

To the EDITOR.

SIR,—May we say in reference to your article of last week that Mr. Crooke has been good enough to explain his method of producing the admirable prints we sent you? He squeegees them downon glass in the usual way, and after mounting passes them through a rolling press.

We have tried the method you suggested, and whilst it produces capital results, it is not commercial, for the celluloid sheets are spoilt after once or twice using.

We thank you, Sir, for your impartial summing up of the question of "Gelatine *v.* Albumen," and feel we are not too sanguine in prophesying that gelatine will replace albumen in the nineties as it replaced collodion in the seventies. Such a consummation is devoutly to be wished, not only in the interests of English trade, but on account of the superiority of results.—We are, yours, &c.,

THE BRITANNIA WORKS COMPANY, LIMITED.

PHOTOGRAPHY AT THE WORLD'S FAIR.

To the EDITOR.

SIR,—I enclose a copy of an official letter received from Chicago relative to the photographic privilege at the Columbian World's Exposition, which I think will interest many of your readers. In accomplishing this much I wish to convey to our many friends on your side of the ocean, through your JOURNAL, my sincere thanks for the aid they so kindly give us. Probably further restrictions which now appear may be removed by the time the Exhibition opens.—I am, yours, &c., F. C. BEACH.

301, *Broadway, New York, October* 28, 1892.

The World's Columbian Exposition, C. D. Arnold, Official Photographer.
OFFICE OF D. H. BURNHAM, DIRECTOR OF WORKS, WORLD'S COLUMBIAN EXPOSITION, JACKSON-PARK, CHICAGO, ILLS.
October 25, 1892.

American Amateur Photographer, 239, *Fifth-avenue.*

GENTLEMEN,—Hand cameras using plates up to and including 4 × 5 inches, without tripods, will be allowed within the grounds of the World's Columbian Exposition on and after this date, on payment of a fee of two dollars in addition to the regular price of admission for each day.

Cameras using stereoscopic lenses will not be admitted however small the plate may be.—Very sincerely, C. D. ARNOLD, *Official Photographer.*

DETERIORATION OF OXYGEN.

To the EDITOR.

SIR,—There are one or two questions in the current LANTERN SUPPLEMENT which seem to call for some notice.

The first is, the deterioration of oxygen when kept in cylinders. I have used cylinders almost ever since the introduction of the high-pressure system, and have never found the deterioration spoken of by your correspondent, F. Bailey. A few years ago there was some reason for complaint as to the apparently diluted quality of oxygen being supplied, but that has for some time now been remedied, and I do not think there is now any need to find fault on that score. As for deterioration after two months, my experience has been this:—A few days ago, beginning the season, I used some oxygen for a public "show" that had been filled into the cylinder last April, the cylinder then being about half emptied, and the oxygen was, after nearly seven months, quite as good as when freshly charged, and was what I expected from past working. I think most London workers who go to the "Brin's' Oxygen Company" will bear me out in this experience. As you know, Sir, I have no interest in any oxygen suppliers, and only speak of them as I find them.

A question asked by "Operator" as to recessing the oxygen jet three-eighths of an inch in his blow-through jet, deserves just a word. Three-eighths of an inch is rather a long way in, and the result of the combination of gases so far in the tube will probably be, as I have myself found, to melt off the nose of the burner until it is of a safe length, to its detriment, of course. One-eighth or three-sixteenths at most is, I think, quite as far as he may safely go, and in this position the light will be much better than in the form of blow-through jet usually sold. But if he uses the jet for dissolving, and does not keep just a little oxygen always "on tap," he must look out for pops which may make his tubes jump about in a rather startling fashion.—I am, youre, &c.,

November 7, 1892. LIME-BURNER.

THE DETENTION OF SPECIMENS.

To the EDITOR.

SIR,—Allow me space in your JOURNAL to make a few remarks with regard to photographic assistants and their specimens. The practice of sending specimens when applying for a situation is an old one, but one which causes much unpleasantness to both employer and *employé*, and serves no good purpose; for how often after carefully wading through a pile of prints and the sender of the best engaged, who only fills the vacant situation a few weeks, whereas if the holder of a good testimonial had been engaged thorough satisfaction would most probably have followed. But the great evil of sending specimens is they get into the hands of unprincipled men, who often simply advertise for assistants in order to get prints for their own show cases. I noticed a few weeks back a correspondent complaining of not being able to get his specimens back from a firm in Australia, who I remember distinctly promised in their advertisement the return of all prints, &c., submitted to them, but they failed to keep their promise in more than one instance.—Thanking you in anticipation of inserting, I am, youre, &c., PYRO.

Birmingham, November 7, 1892.

[Why do not assistants take our oft-tendered advice (when sending specimens) to write their names and addresses on the pictures? This would prevent any misuse of them.—ED.]

CHARITABLE LANTERN ENTERTAINMENT SOCIETY.

To the EDITOR.

SIR,—I am pleased to see, by the notice in your issue of last week, that a society has been formed having such a grand object as the entertaining of the inmates of our hospitals, &c. Those who have had the misfortune to be placed in a hospital will know how long and dull the time appears to them, and how anything done to break the monotony is appreciated.

I have applied for membership, and intend to do what lies within my power to promote the objects of the Society, and I have myself already been promised help from others.

I should think that there are many who can spend an hour or two once a week or fortnight to assist in this good work.—I am, yours, &c.,

46, *Palatine-road, Stoke Newington, N.* E. DREW BARTLETT.

THE BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—I am pleased to say that my letter in the last week's paper has brought one or two offers from employers, which have enabled us to fit good men into situations. I have one offer which is rather peculiar. A gentleman who has a good, portable saloon studio, which he has worked profitably both winter and summer up to the present, but which he is now working in the summer time only, and settling in a small town during the winter, offers to let it to a good reliable man on condition that he will retouch a few negatives for the owner, and hand him as rent all money taken over 30*s.* per week. As I have a very great number of assistants on my books, any one of whom might be willing to entertain this offer, I ask you to let me make it public through your medium, which will save me an immense amount of correspondence. One employer says that he supposes we have only "lame ducks" on our books, and others seem to have this notion. This is quite a mistake, for we have the addresses of operators and retouchers, managers, and others, who are only just out of best berths, for the men whose names are on the Employment Bureau are in no way connected with those who apply to the Benevolent for monetary assistance. We have almost all classes.

I notice in your "Lantern Notes and News," in the current issue, that you comment upon the fact that far more tickets are printed for the Benevolent Night than the capacity of the Parent Society's exhibition room seems to warrant. This criticism has been advanced by several people this year, and the fact of the high number of tickets has deterred some from purchasing. Unfortunately, the conditions of the case prevent us doing otherwise than printing far more tickets than can be used, for we are obliged to send numbers of the tickets on approval to people who kindly sell them for us, and it is only by using a disproportionately large number that we can ensure sending some to all the people who may sell a few. Even with the utmost care in sending out, we find that very great numbers are returned, and yet there are some cases where more could be sold if more were sent. For instance, the London Stereoscopic Company sold twenty-five tickets at their West End house, and said they

could have sold twenty-five more if they had had them on the last day, while several other houses, from whom we expected good sales, have returned the whole of their twenty-five; others who received ten have only sold one or two. We are extremely grateful to the Parent Society for the use of the exhibition room for one evening. Of course, if they were willing to allow us the sale of a given number of tickets for use for three or four evenings, we should be very pleased to work it on that basis.

I am, yours, &c., H. SNOWDEN WARD,
Memorial Hall, London, E.C. *Hon. Secretary P. B. A.*

AMIDOL.

To the EDITOR.

SIR,—Can you tell me why I cannot get a negative the right density with the above developer? I have exposed ever so many plates, giving short, long, and correct exposures; tried it with and without bromide, made it according to instructions, in fact have done all I can, and yet all negatives are as thin as possible.

I read and hear of such excellent results with it that I cannot understand how it is I fail.

When developing a plate, it seems to darken all over before the picture appears, and after, say, fifteen minutes, so very thin as to be useless, yet with another developer I got a good printing negative.

The stuff keeps clear enough; in fact, practically colourless.—I am, Yours, &c., W. S. P.

Liverpool, November 1, 1892.

To the EDITOR.

SIR,—I should like to inform you of an experience I have had with amidol which does not seem to have come to light before. About twelve days ago I mixed two ounces of stock solution of amidol. I diluted what I required for use with three parts of water, and added two drops of ten-per-cent. solution of bromide of potassium. It developed some landscapes splendidly, and I formed a high opinion of it. The next day I used the same solution, with a few drops of stock solution added, to develop some rather under-timed baby portraits. They also turned out very well. I then put it aside until to-day, when I thought to develop some well-exposed portraits. The solution was a pale yellow colour, but, to my surprise, no image appeared in three or four minutes. I threw this away, and mixed a fresh lot from the stock solution, which had turned a deep brown tint. This, too, failed to produce any image in five minutes. Having thrown this off, and washed the plate, I applied pyro developer, which rapidly brought out the image to good density. Having heard that amidol would develop almost indefinitely, I thought this would be interesting. My stock solution was made as directed by the vendors, viz.:—

Amidol	80 grains.
Sod. Sulp.	800 ,,
Water	8 ounces.

—I am, yours, &c., OTHELLO.
October 31, 1892.

[We shall shortly be having another article on the subject of amidol.—ED.]

EASTMAN'S FILMS—A HINT.

To the EDITOR.

SIR,—As I have found users of roller films troubled with the curling propensity of these convenient things, when printing and when necessary to dodge, &c., I can recommend them to try putting the films on glass while slightly damp, and fastening down the edges with binding strips used for lantern slides; then, when they are dry, they can be used in any way desired without trouble.—I am, yours, &c., J. S. DICKIN.
32, *Houghton-street, Southport, October* 28, 1892.

WEST LONDON PHOTOGRAPHIC SOCIETY.—November 15, Technical Social Meeting.

NORTH SURREY PHOTOGRAPHIC SOCIETY.—November 15, Mr. Lewis Wolff on *Development*.

PHOTOGRAPHIC CLUB.—November 16, Annual Dinner. 23, *Flashlight Photography*.

EXETER AMATEUR PHOTOGRAPHIC SOCIETY.—Saturday, November 12, is the last day for sending entry forms for this Exhibition.

PUTNEY PHOTOGRAPHIC SOCIETY.—November 21, *Bromide Enlargement*, by the Eastman Company. December 5, *Work with a Hand Camera*, A. K. Dresser.

MESSRS. MARION inform us that they have recently made a batch of instantaneous plates perfectly free from fog, Actinograph No. 25. They believe this to be the highest speed yet reached.

THE Hackney Society's Exhibition will be opened at 12 o'clock midday on Thursday the 17th inst., the other two days at four. Sir Charles Russell has consented to be present at the opening ceremony.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—November 17, Monthly Lantern Night. 24, Members' Open Night and *Cresco Fylma*, by Messrs. Hill. December 1, *Scenes from Ireland*, Mr. F. W. Hindley.

EVERY competitor gaining a medal in the Stanley Photographic Competition is also to be presented with a diploma of merit. The diploma itself is quite a work of art, and has been produced from a special design by a well-known firm of fine-art lithographers.

THE improvement in the attendance at the Exhibition continued to the end. The number of visitors in the past week was 1842, making a total of 8799 since the opening day. On Wednesday week, in spite of the heavy downpour of rain, there were 190 in the Gallery to see the slides lent by the Amateur Photographic Field Club.

BRIXTON AND CLAPHAM CAMERA CLUB.—The third Annual Exhibition of Photographs and Lantern Slides, comprising landscape, marine, architectural, animal, and figure studies, will be held at the Clarence Rooms, 376, Coldharbour-lane, Brixton, on Thursday, November 17, 1892 (7.30 to 10 p.m.); Friday, November 18 (3 to 10 p.m.); and Saturday, November 19 (3 to 10 p.m.). The Judges are Messrs. W. Bedford, F. P. Cembrano, and Andrew Pringle.

BLACKHEATH CAMERA CLUB.—Syllabus, 1892-1893. 1892: November 15, *Lantern Slide Development*, Mr. J. T. Field. 29, *Enlarging*, Mr. A. R. Dresser. December 8, *The Optical Lantern and how to use it* (illustrated), Rev. W. H. K. Soames, M.A. 1893: January 3, *Platinotype Processes*, Mr. S. G. Buchanan Wollaston. 17, *A trip to Norway* (illustrated by lantern slides), Mr. W. C. Chaffey. February 1, An evening with Mr. E. J. Wall. 15, Lantern Night.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.—November 15, Lecture by J. P. Gibson, of Hexham, on *Bamburgh, the Farne Islands, and Grace Darling, the Northumbrian Heroine*, illustrated by 100 lantern slides from Mr. Gibson's own negatives, in the Concert Hall of the Art Gallery, Newcastle, on November 15, at 7.30 p.m. Lantern exhibition of 150 slides by eminent photographers at the Concert Hall of the Art Gallery, Newcastle, on November 14, at 7.30 p.m.

AMONG the exhibitors of apparatus in the Photographic Section of the Stanley Show are Messrs. R. & J. Beck, B. J. Edwards & Co., Sands, Hunter, & Co., Dallmeyer & Co., Lonsdale Brothers, City Sale and Exchange Rooms, Elliott & Son, W. Wray, Platle & Witt, Morley & Cooper, Autotype Company, A. J. Smith & Co., H. Park, and others. The Agricultural Hall is so convenient of access from all parts of London that this new Photographic Exhibition should be visited by all who are interested in photography. In addition to the exhibition of apparatus and the picture competition, a very large number of entertainments are advertised.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—A meeting of the Committee was held on Thursday, November 3rd, Mr. W. Bedford in the chair.—The Hon. Secretary stated that Mr. Frederick Hollyer had generously offered to devote the proceeds of the last day of his exhibition at the Dudley Gallery, Piccadilly, to the funds of the Benevolent. Since the last meeting the Secretary had received applications from many assistants wanting situations, and in three cases had been able to secure satisfactory positions, but there were still many applicants for work on the books. Messrs. Redmond Barrett (London), A. G. Tagliaferro (London), and H. Thompson (Sunderland) were elected members of the Association, and the Secretary stated that in addition to subscriptions from these gentlemen, subscriptions, donations, or other moneys had been received from Messrs. Jonathan Fallowfield, Oscar Scholzig, W. F. Rogers, the Eastman Company, Limited, T. Charters White, W. Fenton Jones, Wratten & Wainwright, and A. M. Levy. Four applications for relief were considered and dealt with as follows:—1. An applicant who had just secured a situation through the medium of the Association had only applied for a loan at the suggestion of the Secretary. The Committee granted a small loan to cover immediate expense, and to be repaid out of salary. 2. Application for loan of 2*l*., to enable applicant to clear a small pressing claim, and to redeem the apparatus required for work which was offered to him. Loan granted. 3. Application for loan of 5*l*., under circumstances similar to above. Loan granted. 4. Application for assistance to commence business. The Committee considered the application, and as the applicant was at present in a situation and not in indigent circumstances, it was decided that the case was not one to be dealt with by the Benevolent. In the cases where assistance was granted, very careful investigation had been made, and two of the applicants were personally interviewed by the Committee.

Answers to Correspondents.

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & CO.," 2, *York-street, Covent Garden, London.*

J. BILLCLIFF.—Thanks for the information.

CREDIT.—Take out a summons in the local county court.

THOMAS EVANS.—We shall probably have an article on the subject.

COLLODIO.—We are unable to supplement the information you have obtained.

A. DONALD.—Possibly the two systems are dissimilar. Can you give us particulars of yours?

HERBERT JOHNSTONE.—An east top and side light will answer, provided you have suitable blinds.

T. MORRIS.—Try some of the coal-tar colours, say Judson's dyes, of the tint you wish to stain the wood.

N. COURTNAY.—We have had no opportunity of comparing the lenses named, hence we can offer no opinion.

GOLD.—Protosulphate of iron is a precipitant of the gold. You had better decant the solution containing the iron, and not boil it.

E. J. AUSTIN asks "if wooden dishes will answer for developing bromide prints, or if glass-bottom dishes are better? I find porcelain dishes too heavy for 24 × 18."—Either will answer quite well.

G. FINDLAY.—We do not recommend special patent agents. If you choose, you can prepare the specification yourself by applying at your post-office for the requisite forms, which will be provided free of cost.

C. B.—There will be an article on the subject in the next ALMANAC. We should advise you to write to one or two firms commercially engaged in zinc etching. We do not know any teacher we could recommend.

J. L.—If the emulsion fogs, the best way is to discard it and prepare fresh. It is not worth the trouble to attempt to restore small quantities of spoilt emulsion, more particularly as the attempt usually ends in failure.

A. B. C.—Wet-collodion slides, if the bath and collodion are in good condition, rarely require toning. However, flowing them over with a solution of one or two grains of chloride of gold in an ounce of water will, in some cases, be an improvement.

W. JONES writes: "I want to cover the glass of my studio with waxed paper to soften the light. Could you please tell me where I can get the paper?"—You had better prepare the paper yourself, by applying, with a soft brush, a solution of wax in spirits of turpentine.

J. L. W.—The mere fact of putting wheels on the studio will not exempt it from the Building Act. Such an idea exists, we believe, but it is a fallacy nevertheless. If you act upon the idea in defiance of the District Surveyor, you will place yourself in an unpleasant position.

INTENSITY.—The distance of the two subjects apart has nothing whatever to do with their coalescence in the stereoscope. The only difference will be that there will be a greater amount of relief in the one in which the lenses of the camera are separated to three or four inches than when they are closer together.

D. MALONEY.—Your failure is not to be wondered at. The temperature given was according to the Centigrade scale, and you tried working to the scale of Fahrenheit. Forty-five degrees on the former scale corresponds to 113° on the latter. No wonder you failed to make a highly sensitive emulsion. In French works the Centigrade scale is the one universally quoted.

OPERATOR.—The work is fairly good, but is much marred by the retouching. However, it is not up to the standard, either from a technical or an artistic point of view, of high-class London work. If you could obtain an engagement in a first-class house as assistant, you would there have the opportunity of improving yourself. That is the best suggestion we can make.

C C. C.—The want of sharpness is caused by the camera being moved during the exposure, notwithstanding your assertion to the contrary. The image, even the brick wall, is doubled throughout. Had the plate dropped in the rabbet of the slide as sometimes happens with thin plates and a weak spring on the partition of the dark slide, the doubling would have been vertically instead of laterally.

STEPHEN HARRIS.—The unequal toning in the prints is caused by the surface of the paper being contaminated with finger marks. The markings of the skin on the albumen are very palpable. The trouble is easily avoided with more care in the working. We are assuming that the paper was all right when you received it, but it is sometimes very carelessly handled by inexperienced packers.

M. HURST.—The engravings named would make excellent lantern slides, and they would be very popular, no doubt; but it should be borne in mind they are copyright, and it is piracy to copy them in any form. The proprietors of the copyright, we feel sure, would take proceedings against any one infringing their rights. This is scarcely to be wondered at when the high price paid for the copyright is considered.

S. C. R.—Photographic paper, suitable for ordinary silver (albumen) printing, is not made in the United Kingdom. The only reason to be assigned for it is that British paper-makers have not enterprise enough to take the matter in hand. Those we have spoken to on the subject say the consumption is "too small" (?) to make it worth while to experiment, and then lay down the requisite plant for its manufacture.

J. S. DAWSON says: "In your article on 'Has Albumen received its Death Blow?" on p. 708, in the instructions for mounting you omit to say how the prints are pressed in contact with the mounts. I usually use blotting-paper in silver printing; it does not answer with gelatine. This item is usually omitted in instructions for this paper, which I think is its greatest drawback."—We should be glad to receive the experiences of others on this point.

STUDIO.—We have not the book to which you refer, so cannot say if the studio there recommended is the best or not, and for the same reason we are unable to advise you as to the quantity of glass that is necessary for the top and side light. If you send us a sketch of the design, and the aspect in which you propose to build, we shall be pleased to advise you. Your proposed proportions, thirty feet by fourteen feet, are very good indeed for all-round work.

T. OWEN says: "An artist has just finished a picture, and has allowed me to photograph and sell copies of it. At the time I made my negatives copyright, and now I hear that another photographer is applying for permission to copy the painting, and is not unlikely to obtain it. Can I, if he does, prevent him from publishing his photographs because mine are made copyright?"—Certainly not, unless you hold the copyright in the painting itself. Your copyright extends no further than your photographs. The owner of the copyright of the painting can give permission to as many as he likes to make photographic or other reproductions of it.

D. MCANDREW says: "I am terribly troubled with spots on my prints; they can be seen when the paper is dried after sensitising if it be closely examined, and they appear larger after printing and toning. The spots always, of course, come in the most conspicuous parts of the picture. What can I do?"—If the spots appear directly the paper is sensitised, the fault lies with the paper. It is a pity to waste time in printing paper that has spots upon it, unless care is taken that where a spot exists the paper is so placed on the negative that the defect comes on some unimportant part. As we have already intimated, such paper should be discarded.

PACO asks: "1. Which is the best size of condenser for an optical lantern? 2 Is there in practice any actual loss of light when using a four-and-a-half-inch condenser, as compared to a four-inch one? 3. Does the diameter of the condenser bear any relation to the focus of the objective? In other words, will a four-inch condenser illuminate a slide (with cushion square mask) equally as well and as evenly with a five, six, or ten-inch objective? 4. What percentage of increase will there be in the light on the screen when using a triple condenser (two plano-convex lenses plus a small meniscus) as compared to an ordinary plano-convex condenser?"—1. Not under four inches, but four and a half inches by preference. 2. Not if the slide be placed properly in the cone. 3. The back lens of the object glass must be so situated as to embrace all the light projected by the condenser. 4. It would be difficult to determine.

J. R. G. says: "1. I want to know when a good pyroxiline could be obtained which would give good density in collodio-bromide emulsion? I have tried Hopkins & Williams', Thomas's, and Rouch's. The last-named I purchased, and dissolved 1 ounce in 20 ounces of ether (717 sp. gr.) and methylated alcohol, (the old methylated), Hopkins & Williams, and, after well shaking up, a dense deposit was thrown or settled down about two inches thick at the bottom of a forty-ounce bottle; nor would any more of it dissolve. I have made three batches of emulsion from it, but I cannot obtain density; it works beautifully clean otherwise. My experience has been the same with the other two makes, viz., a beautiful creamy emulsion which worked very clean, *but no density*. 2. Double bromides. The ammonium bromide and cadmium bromide I obtained from Hopkins & Williams, and used 98 grains of the former and 172 grains of the latter, making it exactly according to Mr. W. B. Bolton's method; but, when I add it to the collodion, I cannot get all of it to dissolve, no matter how much I shake it. A fine white crystallised deposit falls to the bottom of the bottle, which seems to me to be part of the bromides undissolved, and to filter it out would leave it uncertain as to the amount of soluble haloid in the emulsion. I may say that I have made several lots of emulsion with zinc bromide, and can get any amount of density with this salt; but I find it very liable to cause small transparent spots in the films, although I dissolve the zinc bromide in pure alcohol, and have let it settle for months before using. I always wash the emulsion with pure distilled water, and dry on a hot-water bath, and am considered a very careful worker. I use up to 22 grains per ounce of silver nitrate in emulsifying, and have used as low as 15 grains per ounce, but it does not seem to make much difference in the density. The colour of the emulsion when made is a deep ruby orange. I should like to be able to make an emulsion which would give good density and warm tones without having to intensify."—Working under such conditions as our correspondent describes, successful results should be obtained. Perhaps, however, some of our readers who have experience of collodion emulsion can be of assistance in the matter.

AN ACROSTIC.

D'YE want to make a photographic work of art?
A thing of beauty and a joy for ever?
Very easy is the photographing part;
Indeed, one need not be the least bit clever.
See that the image is a shapeless splodge
On screen. Expose, the fraction of a minute.
N.B.—Your work of art is made. The dodge
Is artful, but there is no nature in it.

F ♯

FORTHCOMING EXHIBITIONS.

November 11-12..... *Leytonstone Camera Club. Hon. Secretary, A. E. Bailey, South West-road, Leytonstone.
,, 15-17..... *Hackney Photographic Society. Hon. Secretary, W. Fenton Jones, 12, King Edward-road, Hackney.
,, 17-19..... Brixton and Clapham Camera Club. Hon. Secretary F. W. Levett, 74, Geneva-road, Brixton, S.W.
,, 18-26..... *Stanley Show (Photographic Section). Hon. Secretary, Herbert Smith, 29, Finsbury-pavement.
,, 23-25..... *Tunbridge Wells Amateur Photographic Association. Hon. Secretary, Joseph Chamberlain, 14, Calverly Park-gardens, Tunbridge Wells.
,, 24-26..... *Exeter Amateur Photographic Society. Hon. Secretary, J. Sparshatt, Fairfield House, Alphington-road, Exeter.
*South London Photographic Society. Hon. Secretary, C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.
,, 28 ..... North Middlesex Photographic Society.
1893.
February 18..... Holborn Camera Club. Hon. Secretary, F. J. Cobb, 100 High Holborn, E.C.

* Signifies that there are open classes.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1698. Vol. XXXIX.—NOVEMBER 18, 1892.

A NEGLECTED PROPERTY OF GELATINO-BROMIDE OF SILVER.

At the meeting of the Photographic Society of Great Britain, last week, in the remarks on Mr. Howard Farmer's paper, entitled "Some Remarkable Properties of Silver and Gelatine," the President, Captain Abney, said that if the gelatine film were more experimented with there were many possibilities that would open out in photographic printing. This no one can deny, when it is considered how closely a gelatino-bromide of silver film is, in its properties, allied to one of bichromated gelatine, when modified by the action of light. In the beginning of this year we devoted an article to the subject in which this similarity was pointed out. We again refer to the matter, as there is no question that films possessing the properties of those of bichromated gelatine, with the sensitiveness of an ordinary dry plate, have immense advantages from a commercial point of view, more especially at a season like that now upon us. In working the photo-mechanical processes, such for example as collotype, Woodburytype, and other processes based upon gelatine in conjunction with bichromates, much inconvenience and loss are experienced during the winter months by the lengthened exposure necessary.

In his paper, Mr. Farmer says, that a silver bromide plate developed with ferrous oxalate, and then placed in a solution of ammonium bichromate, behaves, when treated with cold or hot water, in the same way as exposed bichromated films — as carbon prints in fact. There is no necessity, however, to treat the silver image with the bichromate at all if it be developed with pyrogallic acid, and this fact was established many years ago. The property was first noticed, we believe, by Mr. J. W. Swan, who found that a developed bromide film was in many respects analogous to an exposed film of bichromated gelatine. It absorbs water and swells up in proportion as it has been protected by the negative from the light's action, just as does the film of a collotype plate, or one prepared for the "swelled gelatine process." It was also noticed that, as in the processes just alluded to, the swelling is augmented by the application of a slight heat. Recognising the commercial application of this property, he in 1879 took out a patent for producing printing plates based upon it. The process is this :—

A negative is taken on a dry plate in the camera in the ordinary way, and if a half-tone typographic block is wanted the exposure is made with the usual line screens. After the image is developed the plate is placed in tepid water, or, while still moist, subjected to slight heat. Under this treatment the film behaves like one of gelatine sensitised with a bichromate. The image swells up and acquires sufficient relief to admit of a satisfactory printing block being obtained. Mr. Swan in his specification also mentions another method of making reliefs, based upon the similarity of the bromide to the bichromated film—namely, by dissolving away the gelatine with acetic acid. He also refers to the effect of different substances in modifying the grain of the bromide image, which produce similar results with the bichromated one.

In 1881 Mr. Warnerke recognised a further analogy between the exposed bromide film and one of bichromated gelatine. This formed the subject of another patent. The bromide emulsion in this case is spread upon paper, and after exposure is developed with pyrogallic acid. It may then be fixed or not with hyposulphite of soda, as it makes little or no difference in the end. After drying, the picture is treated exactly as if it were an exposed carbon print. It is placed in cold water and squeegeed on to a glass plate or other support, allowed to rest for several minutes, and then put into warm water. The original paper support now comes off, and the gelatine, unaffected by light, dissolved away, leaving the image in relief, just as in the case of the carbon print. Indeed, Mr. Warnerke proposed to add pigments to the silver emulsion, and thus secure a carbon tissue having all the sensitiveness of gelatine plates.

Mr. Warnerke, in a paper read before the Photographic Society of Great Britain (see page 268 of our volume for 1881), recognises the value of this method in producing Woodbury reliefs, and he mentions that for this purpose the emulsion must be in a thicker layer and be less opaque, so that the light may penetrate deeper into the film, and thus give a high relief. Now, these conditions are precisely analogous to those existing between ordinary carbon tissue and the usual Woodbury film. The latter is simply a thicker film of gelatine, and contains less pigment ; hence the light in printing enters deeper into the film, and thus renders a greater thickness of the gelatine insoluble. Mr. Warnerke also refers to other applications of this, at that time novel, property of gelatino-bromide of silver in connexion with other mechanical processes.

Reference was made the other night to the use of silver salts in the collotype process. Some twenty years ago it was customary to add a very small proportion of iodide and bromide of silver, as well as chloride of gold, and several other substances, to the gelatine, though no one seemed to know why. One by one the employment of these things was abandoned, and now only gelatine is used. It may, however, be mentioned in connexion with this point that the use of silver salts, as employed at the time referred to, bears no relation whatever to the property now under consideration. They were used only in infinitesimal quantities, and took no part at all in modifying the gelatine.

As we have said before, this neglected property of gelatino-bromide of silver may be turned to great advantage commercially. It would be superfluous for us to extol the value of collotype plates, Woodburytype, and other films for mechanical work, which would have the sensitiveness of dry plates where rapidity of production is a consideration and the light is bad. We may probably recur to this subject when Mr. Farmer's paper is published in full.

METHODS OF ARTIFICIAL ILLUMINATION FOR ENLARGING OR REDUCING.

We may supplement our article of last week by a brief account of the simplest way of utilising the reflector therein described. Starting with the built-up shell of cardboard, we have to decide upon the best means of introducing the apparatus by which the light is produced. This will depend in great measure upon whether the magnesium is to be used in the form of wire or powder, though we may say at once that the reflector is far better suited for the former than the latter; indeed, from the point of view of convenience, when using the powder a "reflector" of much larger dimensions and simpler construction, an ordinary square box, in fact, will suffice for all purposes of reproduction.

Assuming, then, that wire, or rather ribbon, is to be used, we have to provide means by which the supply of magnesium is fed into the reflector, so as to become ignited at a spirit or other flame placed at or near its focus. In the magnesium lamps of commerce, several of which have been before the public for many years, clockwork is utilised for the purpose of regulating the supply of magnesium; but, though this arrangement is perfect in action, it is necessarily expensive, while for our purpose no great nicety is necessary, and the object is to adhere to the most simple means. A little hand lamp, placed on the market some three or four years ago at a cost of two or three shillings, will supply the principle upon which we have to work; indeed, if these lamps are still obtainable, it will save trouble if one of them be adapted to the reflector almost without modification.

The essential parts of the lamp consist of a spindle, upon which the coil or roll of ribbon is carried, and from which it passes between two little rollers covered with indiarubber tubing, and pressing tightly together, into a thin bent tube, which conducts it to the igniting flame. One of the rubber-covered rollers is provided with a winch handle, in rotating which the ribbon is drawn off the store coil and passed on towards the flame, and it requires very little skill to keep up a tolerably regular speed, and, consequently, a uniform illumination.

In a portable lamp, such as the one we have alluded to, the igniting flame is almost necessarily a spirit flame, since it would be manifestly inconvenient to be constantly attaching and detaching an indiarubber tube to connect it with the gas supply, even where such might be available. Even in the case of a fixed apparatus, as our reflector might be made, there are many arguments in favour of spirit; but, as in the majority of instances in which it is used it will not be in a fixed position, we may safely decide to rely upon spirit.

Before commencing on the actual arrangements, the reflector should be first attached by its back portion to a solid block of wood roughly hollowed to fit its external shape, glue or screws, or both, being used for the purpose. This will form a solid basis for fixing the various attachments, and will also enable the reflector itself to be more firmly held upon any suitable support. The most convenient support we have found is an upright iron rod with heavy foot, such as is used for retort stands and similar purposes, upon which the reflector may be made to move in precisely the same manner.

Proceeding to the fixture of the lighting arrangement, we will take the spirit flame first. The easiest way of managing this is to insert firmly into the wood block, from the inside, a piece of stout wire bent into a circular loop at one end like a retort ring, the position of the loop when fixed being a short distance below the calculated focus of the reflector. This will serve to hold a plug of cotton, or asbestos, or a disc of felt, to be saturated with spirit, or, better still, a small metal capsule into which spirit may be poured. The filling of the capsule and the ignition of the spirit may be effected by means of one or other of the ventilating apertures in the upper and under sides of the reflector; or a special opening may be made at the side, which will also answer, when covered with a movable coloured glass screen, for watching and regulating the supply of ribbon when the apparatus is in use. Of course these apertures should be as few and as small as possible, in order not to interfere any more than needful with the regularity of the illumination.

For the introduction of the ribbon, a thin tube wide enough to let it pass easily and smoothly must be passed right through the wood block to a point within the reflector, so far above or behind its focus that when ignition takes place it is exactly at the focal point. The exact point may not be arrived at at once, but if the tube be made to slide stiffly in the wood block, and a similar slight movement be possible with the spirit holder, then the arrangement will be capable of any adjustment that may prove necessary. The fine tubing necessary for this purpose may be obtained at any of the model shops, or at many of the dealers in clockmakers' materials in Clerkenwell. If obtained of a size a little less in diameter than the width of the ribbon and then slightly flattened, it will be better than if used round.

The details of fixing the feeding rollers need scarcely be entered into here as they will suggest themselves to the individual mechanic, but if any trouble presents itself the better plan will be to procure one of the "lamps" we have spoken of, and to thrust its tube into the desired position. A side aperture mentioned above, if placed opposite the igniting point, will enable the operator to watch exactly how much ribbon he is winding off while it is burning.

A couple of tubes of brass or tin pushed into the ventilating holes will improve the working of the apparatus by inducing a more vigorous current to carry off the magnesium fumes. The lower one need not be more than two or three inches long, but the upper or chimney may with advantage be a foot or more in length, so that it does not render the affair top heavy. They do not require careful fixing, but may be arranged to push in and out of position when required for use. As short a portion as possible of each should protrude into the interior.

Two or three coats of white paint—preferably "flatted"—for the interior, and a sheet of ground glass for the front will complete the apparatus, which will then form a very efficient radiant for the purposes intended.

A New Photographic Institution.—We are informed that steps are being taken to discuss the advisability of forming in London a central photographic club, to which professional and amateur photographers, the trade, and, indeed, all sections of photo-

graphers would be eligible for election. The club would be open during recognised club hours, and many facilities not enjoyed by existing institutions—which it is intended rather to supplement than to rival—would be afforded. The idea is receiving influential support.

A New Comet.—Photographers with astronomical predilections will be interested to learn that a new comet has made its appearance. It is to be found in the constellation Andromeda. Mr. Edwin Holmes, who first noted it, writes that, although the night was hazy, he was able to distinguish it with an opera glass.

Rapidity of Plates.—It is only a year or two since it appeared that the desire for plates of phenomenal rapidity was abating: but to judge by recent indications, there has been a revival of feeling in their favour, the makers vying with each other in producing sensitive films which are alleged to possess higher rapidity than that hitherto attained. Whether the most rapid plates of the present day are, after all, really quicker in practice than those of five or six years back is a theme for speculation. One thing remains certain, and that is that, except in comparatively few branches, photographic plates of extreme rapidity are not desiderata.

Cost of Electricity.—The latest authoritative statement as to the actual cost of electricity was made at the recent session of the Junior Engineering Society. The cost, to what may be termed the makers, will be not much less than eleven pounds per annum for every kilowatt, and afterwards to give the supply will not cost much less than one-third of a penny per unit. It is hopeless, it is said, for electricity to compete with gas in this country all along the line, if price is the only consideration; but, with selected customers, electricity is cheaper than gas.

Photography by Special Wire.—There seems to be a determined effort to assert, or to prove by realisation, the possibility of sending, by the medium of the electric telegraph, actual views and portraits. What is now asserted is, that a syndicate is proposed in Chicago which will undertake to send photographs by telegraph, and reproduce them on the screen in distant cities by means of a system of tele-photography. The exact system is said to have been described in the *Figaro* some three years ago, in connexion with experiments by M. H. Courtonne, a French chemist. Possibly the method may have something in common with that of Amstutz which we briefly described in the early part of the year.

Microscopic Cover Glasses and their Dimming.—Herr R. Weber has been investigating the cause of the clouding that occurs on the inner surface of the thin microscopic covering glass which would render them entirely useless for photography. He finds it due to the composition of the glass. Those glasses which contain an excessive amount of alkali soon lose their lustre and become dim when exposed to moisture. Passing by as not necessary for our readers an account of the analyses he made of various glasses, we may give his practical conclusions, which should be well borne in mind by those who practise photomicrography. He finds the glass most stable in air is that which is slightly green in colour; hence the pure white glass, so much affected by some mounters, should be entirely eschewed when their use in photography is in view.

Remarkable Radiations.—The old idea of resolving light into three constituents, "actinic, calorific, and luminous," has long been exploded, and radiations only are spoken of, the various effects named being functions not of a particular radiation but of what might be termed the translating medium—that is, the medium which renders them sensible to our human faculties. M. Piclet, famous for his success in condensing the "permanent gases," has found that the radiations from bodies of extreme coldness possess a power of penetration almost passing belief. Hitherto the surrounding a body with a wall of cotton wool has been considered sufficient to protect it from all radiations, ingress or egress; but M. Piclet finds that when the temperature is reduced to, say, 110°, the long ether waves will pass readily through almost all bodies, a thickness of over half a yard of cotton-wool being no protection to bodies at that temperature. When they are exposed to a lower temperature they cool with equal rapidity "whether the layer of wool be two, ten, or fifty centimetres thick, i.e., an inch, four inches, or over half a yard."

DENSITY IN COLLODION EMULSION PLATES.

The troubles alluded to by your correspondent "J. R. G." in last week's JOURNAL in connexion with the want of density in collodion emulsions are perhaps not new or confined to his own practice, for the difficulty of obtaining sufficient vigour combined with sensitiveness has been known since the earliest days of emulsion photography. Still I am inclined to think that the trouble is greater at the present day than it was ten or twelve years ago or when collodion emulsions were more in vogue for landscape and general work.

The fault is due undoubtedly to the fact, that nowadays it is next to impossible to obtain pyroxyline of exactly the right kind for washed emulsion of the most rapid type, though it is comparatively easy to satisfy the requirements of the slower forms of emulsion, especially unwashed. So limited is now the demand for pyroxyline of that particular kind, that it is not worth the while of any of the manufacturers to make a special article of it, particularly as it is the most difficult of any sort to produce of uniform quality. Whereas in former days every dealer of repute kept in stock "high-temperature" cotton specially adapted for emulsion work, I question whether there is, to-day, more than one place in London where it can be obtained.

Of the the three samples mentioned by your correspondent, I only know the first and last, both of which in my hands work well, though the latter is the one more suited to washed emulsion work. The sediment complained of is no detriment to the working of the pyroxyline, but rather a necessity of its manufacture, for it is very rarely that a really "high-temperature" cotton, or one that gives a "powdery" and organic film, will dissolve completely in ether and alcohol. In the old days it used to be considered almost a *sine quâ non*, even for wet collodion, that the cotton should leave some sediment, and some of the more powdery kinds that gave the best results when used dry were remarkable for the quantity that remained undissolved. At the same time it is by no means an unusual occurrence to find a sample that gives a perfectly clear collodion that will also answer for emulsion work.

The want of density complained of is most likely traceable to one, or perhaps both, of two causes in your correspondent's case, namely, using the collodion too soon after bromising and washing the emulsion before it has thoroughly set. There is one other cause that may work with many samples of pyroxyline, though not with others, namely, the presence of excess of bromide during the whole period of sensitising.

With regard to the first cause, though it is by no means impossible to get any required density with an emulsion that has been sensitised immediately after bromising, as is frequently the more convenient plan, still it is beyond doubt that density comes far more readily, under ordinary treatment, when the collodion has been allowed to "ripen" for at least a few weeks after the bromides have been dissolved. This is more especially the case when bromide of cadmium is employed, either alone or in combination with another salt; if ammonium or zinc bromide, alone or in conjunction, be used, to the entire exclusion of cadmium, the collodion may be used a very short time after bromising without any apparent loss of the power of getting density. But for several reasons I have never greatly liked the zinc salt, and greatly prefer the double salt of ammonium and cadmium to all others. I should prefer ammonium alone were it not for its low degree of solubility in alcohol, and the necessity it involves of adding more water to the collodion if an emulsion rich in silver is required.

The loss of density arising from washing the emulsion before it has properly set occurs with every kind of bromising salt, but it is less likely to happen, other things being equal, with cadmium than in other cases, owing to the peculiar action of that salt in increasing the viscidity or "body" of the collodion. Bromide of ammonium tends

to produce a precisely opposite result, rendering the collodion thinner and more fluent, while the zinc salt seems to set up a sort of process of disintegration, which brings about a still greater fluidity, and thus reduces to a still greater extent the resistent power of the emulsion in washing. In any case the tendency of the washing process is so greatly in the direction of removing valuable density-giving constituents of the emulsion, especially when any considerable proportion of the solvents is left behind, that it is always desirable to let it get as dry as possible before commencing to wash.

Although I am strongly averse to washing the emulsion when it contains free silver, except under very special conditions, I fully recognise the advantage that accrues from the action of free silver during at least a portion of the period of emulsification. In the first place, with most samples of pyroxyline it greatly expedites the formation of a rich and "creamy" emulsion, and this is particularly the case with one of the samples mentioned by "J. R. G."—Rouch's. In the presence of excess of bromide, no matter how heavily silvered the emulsion may be, a beautifully fine but almost transparent film is produced, and this state of affairs will continue after a very long period of "ripening." The density given by such an emulsion under ordinary development is out of all proportion to the *appearance* of the film, but at the same time it is far inferior to that obtained when free silver has been allowed to act for ever so short a period.

If, in sensitising, a portion of the collodion be kept back, say, one-fourth, and the remainder sensitised with the full quantity of silver, the latter will be considerably in excess, and the result will be that in an hour or so a rich dense film will be given that differs entirely in appearance from that produced with excess of bromide after a week's keeping. The remainder of the bromised collodion may then be added without destroying the physical good qualities of the emulsion, but, what is of greater importance, the film will be much more sensitive, and will develop to any density without the slightest trouble.

In advising your correspondent how to get out of his difficulties, I would therefore suggest, first of all, that he should prepare a stock of bromised collodion, and allow it to ripen before use. In doing this there need not be the least uncertainty or ambiguity as to the precise proportion of bromide present in a given bulk after filtration or clearing. If a certain quantity of bromide be dissolved in a known volume of collodion, it matters nothing how much of that volume remains at the bottom of the bottle as sediment; the remaining clear portions contain exactly the same proportion of salt as the whole bulk, and may be measured off for use as required.

Next, I would say, in washing the emulsion, eschew all "fancy" methods of precipitation and suchlike, and follow the good old-fashioned plan of thorough evaporation, using heat if necessary—of course after the emulsion has well "set"—to thoroughly dry it. There need be no fear of the salts not washing out, for, as a matter of fact, they come out more easily from the *dry* "pellicle" than from that which is saturated with dilute spirit, the effect of which is to resist or prevent the penetration of the washing water. From the dry emulsion the soluble salts dissolve almost at once, leaving it not only quite as free from soluble matter but in a better condition to dry quickly before redissolving.

Thirdly, I strongly recommend the method of allowing for an hour or so the action of free silver by sensitising, as I have mentioned, a portion of the collodion with the whole of the silver, and afterwards adding the rest of the collodion. Even if time be an object, it will be gained by this method, for the simple reason that, though the remainder of the collodion be added immediately after sensitising, a better result will be gained, both as regards sensitiveness and density, than with two or three days' ripening in the presence of excess of bromide. But it is absolutely necessary to remove the excess of silver before washing.

With regard to the second difficulty mentioned by your correspondent, the partial insolubility of the double salt of cadmium and ammonium, I can only say it is quite contrary to my experience, and I have used it for a great many years now. Mixed in the proportions named of the two constituents, the compound dissolves easily to almost any extent in ordinary methylated spirit. I always dissolve it in spirit before adding it to the collodion, and, judging from its ready solubility in that menstruum, I should think there is quite margin enough to permit of any reasonable quantity being dissolved in the collodion itself. I have so used it frequently, and have never experienced the difficulty mentioned. I can scarcely see how the result could be produced by improper treatment in the preparation of the double salt, for, if excessive heat were employed in fusing it, the first result would be to volatilise a portion of the bromide of ammonium, and, by thus increasing the proportion of the cadmium salt, render the compound *more* soluble. At any rate, I can only suggest dissolving in alcohol first.

I hope shortly to give an account of some experiments carried out some months ago, but stopped by illness, which had for their object, first, the production of density, regardless of the quality of the pyroxyline; and, secondly, the restoration of density—or the power of rendering it—to emulsions from which it has been removed by improper washing. So far as the first part of the task is concerned, I may say I think I have achieved what I sought; and, as to the second, have obtained most promising results, so far.

W. B. Bolton.

ON THINGS IN GENERAL.

While "Free Lance" has been rusticating, the victim of some of the ills that flesh is heir to, there has been some fine tilting by other doughty champions. I have been attracted by the friendly passage of arms between Messrs. Cadett and Haddon, and all for the good of photography. We all know the tendency of photographers to work by rule of thumb, and to leave exactitude of statement to professors and others, a tendency much to be deprecated. I believe I have done my share in expelling the "pinch of pyro" style of formula from the pages of photographic literature, and it may be fairly hoped that accuracy of statement may continuously increase in the communication of all practical or theoretical contributors to the store of knowledge. Hence I am with Mr. Haddon in his desire to see the behaviour of solutions of ammonia properly understood. But why have the disputants been content to refer to authorities who once held the field, but whose results have been fairly supplemented by recent and still more exact workers? The subject of the strengths of ammonia solutions of various specific gravities is important, and has been well worked out by modern investigators. Still, there is by no means uniformity of result in the data they set before us. Thus, taking the table by Carius in the new *Watt's Dictionary*, we find, for example, that when the solution is of specific gravity ·9001 its ammonia percentage is 29·0 (at 14° C.), and at ·9498, 12·6 per cent. The results of G. Lunge and T. Wiernik at 15° C. (see *Zeit. Ang. Chem.*, 1889, 181–183) give, at ·950, 12·74, and at ·9, 28·33 per cent. At ·884 and 8844 respectively, we have 34·10 and 36 per cent. But, leaving discrepancies aside, a little calculation will show any one that, according to either of these tables, if we mix equal weights of strong ammonia, say, 884, and water, the calculated result will show an error of over three per cent. when compared with the indications of the table. The slight difference in the temperatures may be ignored, seeing that for a plus or minus difference of one degree the correction is only about ·0006.

I have, on a previous occasion, drawn attention to what may fairly be considered a scandal in regard to the sale of chemicals, chloride of gold being advertised for sale at a price not very much over one-half of the value of the metallic gold it would contain if the old style of salt were sold. As a matter of fact, chloride of this stamp contains only just as much gold as the conscience of the dealer permits. The above statement gives a mild idea of the elasticity of that function in some dealers. I am, however, pleased to see the advertisement of a well-known dealer, who now states that he will sell none but the product of a maker whose name is above suspicion, and who guarantees that his fifteen-grain tubes shall hold seven grains of metallic gold. Any one who sells any other sort deserves hooting out of the trade.

I see some correspondent has amusingly been inquiring where a particular sort of medium, "Opie's," can be obtained. One would have thought that every one had heard the old story of that eminent painter who, when asked what medium he mixed his colours with to make them so brilliant, replied, "Brains, sir." But the P. D. has been at work with the Editor's reply, and converted what no doubt

in his "copy" was "vulgar tongue" into "vulgate." He would have to look a long way into that book before coming across the word "brains!"

Another correspondent, W. Potter, asks for information on the anastatic process of printing. There is no doubt that with old works the utmost difficulty will be experienced in getting the ink to set off; but I may suggest to him to try the effect of submitting the old print for some time previously to the vapour of benzol or chloroform, or, perhaps, if long continued, to that of turpentine.

What a neatly arranged hoax that seems to have been—the discovery of Noah's Ark by Archdeacon Norris. Mr. F. R. A. S. has treated it capitally. We may, however, even yet be treated to a continuation of it, and see snap-shots sold at a shilling a copy. I doubt though if the lynch-pins of Pharaoh's chariots would meet with approval.

I am interested in all accounts of new developers, but when Mr. Pike tells us how an amidol-developed plate gave less halation than a similarly exposed one treated with "pyro," I must say that, though feeling bound to accept that gentleman's *bona fides*, one cannot but feel that he has made an error somewhere. I should be very glad to be persuaded into a belief that one developer will give less halation than another, but at present I feel a verdict of "not proven" must be given.

The Editor is to be congratulated on his new *Lantern Supplement*. It will "supply a long-felt want," and, as a matter of course, have a crowd of imitators. A sharp look-out will have to be kept on doubtful suggestions from correspondents, such, for example, as that compressed oxygen deteriorates with keeping, its final state being nothing but atmospheric air, though there was plenty of pressure. This, of course, is an impossibility altogether. Not so, however, Mr. Barker's valuable caution that compressed hydrogen should be tested. When ordinary coal gas is compressed it is quite to be expected that there will be deterioration, some of the less volatile hydrocarbons are sure to be deposited. There are times when it is difficult enough to keep the gas from depositing in the ordinary main supply pipe of premises where it is used under ordinary conditions, far more likely then is it that when compression takes place a deposit should form, and, again, a further deposit when the inevitable cooling takes place during the use of the cylinder for an exhibition. These factors are not sufficiently borne in mind, and it is by no means difficult to see that an accident might be brought about by particles of deposit under some untoward conjuncture of circumstances.

FREE LANCE.

THE PLAGUE OF MEDALS.

In view of the appalling deluge of gold, silver, and bronze raining upon the photographic world in the shape of medals, which in too many cases represent premiums of considerably less intrinsic value than the cost of the material from which they are made, a few remarks upon the present want of system in bestowing "metallic honour" upon candidates for fame are not uncalled for.

The practically unlimited multiplication of worthless, or comparatively worthless, tokens, is not only undesirable in itself, but is, moreover, a very grave injustice to those who have in past times nobly earned their rewards by work well done; for it is in most quarters admitted that in our degenerate days to be merely the winner of a medal, is to receive no more distinction than is a peerage in that all honoured community sung of by W. S. Gilbert, where "Dukes were three a penny."

The question is, How shall we restore to this should be precious emblem of success its pristine value? No doubt there are more ways than one in which this may be effected. In the present communication I do not intend to try and exhaust the alternatives; let me however, in passing, say that it would be well if at its next gathering the Photographic Convention should, putting on one side some of the highly diluted topics in which it seems to find a calm delight, bring this question to the forefront, and seek by some authoritative *pronunciamento* to stay the cruel kindness of those who are in truth burying photography beneath a heap of metal discs.

Let there be no mistake, I am not protesting against tangible rewards. I can even bear with that somewhat maligned individual, the pot hunter; for, if one man can by superior ability sweep the board, why should he not do so, providing, of course, that this be not effected by means of a plucky production, but by sustained and repeated excellence? All I urge is that a medal shall be an honest certificate that the winner has done something notably praiseworthy.

The first step to take in bringing about the much-needed reform is, I venture to think, to consider whether any improvements are possible in the system of awarding medals adopted by the Parent Society. Clearly it is a case with the aforesaid of *noblesse oblige*; and, besides, the value of example is considerable. As an individual who belongs neither to the above nor to the Charing Cross-road Club, I may perhaps be credited with approaching this somewhat delicate phase of the subject without possessing any undue bias; if I have any predilection at all it is in favour of renovating, rather than wrecking, an institution which can point to such a useful and distinguished past as can the Photographic Society of Great Britain. Although, as above explained, I am to some extent "out on the terrace," yet, as the working president of an unusually active provincial society, and also in other capacities which need not be particularised, a considerable volume of genuine and uncoloured opinion has come to my ears regarding the Pall Mall medals, which for reasons that are both good and politic do not see light in the press; none the less these *voces populi*, because they are free as air, are when found to be in substantial accord deserving of more than passing attention. Without of necessity endorsing the opinions I have found to prevail, I give them below for what they are considered worth. They come under three main heads:—

1. Too many medals.
2. Medals given for poor work.
3. Favouritism.

Respecting the first point, there certainly seems an absolute consensus, to which I also subscribe, that the Judges have woefully "cheapened Paradise." As to grumble the second, less unanimity prevails. Of course as long as there exists a critical faculty, and it does not seem to be dying out just yet, so long will there be found criticasters to impugn the decisions of those who have to give the palm.

Still, it would almost seem that an improvement on the present methods of judging is not impossible, of which perhaps more on a future occasion. Coming to that ill-flavoured suggestion of favouritism, personally I think there is but small foundation for any such accusation. It is of course inevitable that a given man will have greater sympathy for, keener appreciation of, some particular form of photographic expression than for another form which may perchance be at least equal, and, in some folk's estimation, vastly superior.

But to see pink where another sees blue is not to be guilty of conscious partiality; and, if a man prefer portraits seemingly taken in twilight, should we wax wrath at his admiring landscapes, which represent smiling nature as being in a perpetual condition of dismal dumps?

Of course, over and above individual predilections and aversions, there are such disturbing things as friendships, clubs, commercial considerations, and coteries as "rings," which, having as a rule their headquarters in London, are certainly not favourably thought of by provincials, nor by others who are without the pale.

Allowing, for the sake of argument, that such closed circles use their influences unworthily, it is to be remembered that the Photographic Society of Great Britain is in no wise responsible for their existence.

But the contention which has been put forward is, that knowing such "communities of interest" exist, the Parent Society should see that the present system of judging at the Pall Mall Exhibition is drastically remodelled.

Of course ardent reformers always shout for a complete upheaval rather than a revision, but to me and most others it would appear that, without on the one hand taking too seriously these mutterings, which though at present not particularly loud are decidedly deep, the executive might well, by the timely introduction of a few remedial regulations, greatly reduce the causes of dissatisfaction. Upon this point it will be my pleasure to submit some remarks in a future article, which, being prompted by a spirit of friendly advice, may possibly not be unhelpful to the powers that be.

HECTOR MACLEAN, F.G.S.

LEYTONSTONE CAMERA CLUB EXHIBITION.

THE first annual exhibition of this, one of the most vigorous of the younger photographic societies, was held on Thursday, Friday, and Saturday of last week, being opened on the first-named day by Lady Brooke in the presence of a large gathering. For the delectation of visitors, the Club put forward, in addition to the display of pictures, a varied programme of music, lectures on photographic topics, demonstra-

tions, lantern exhibitions, and other attractions. Variety, it has been said, is charming; but as one of the declared motives of the Club in holding the exhibition was to afford to neighbours and friends "entertainment blended with instruction," in the first half of which it appeared on the occasion of our visit to be succeeding admirably, the brevity, and maybe the inadequacy, of this notice will easily be understood from the notorious difficulty of criticising a collection of pictures in the presence of a numerous body of perambulatory visitors, the music of "the Veronese band," and other distractions.

Naturally, being a first attempt, the Club effectively established the fact that it has much to learn in arranging an exhibition of photographs. We were informed that the large hall, in which the pictures were displayed, was only available a few hours before the opening time, a circumstance which more than excuses an indifferent hanging, and may perhaps account for the scarcely successful manner in which the judges —the Rev. F. C. Lambert, and Messrs. A. Horsley Hinton and E. J. Wall—discharged their office. The exhibition contained many photographs of high artistic and executive skill, copiously diluted with a large number of commonplace, if praiseworthy, efforts. If the Club undertakes a second public exhibition, it may be well advised to eliminate such pictures as tend to depress the average of quality.

In Class A (landscape, seascape, and architecture; members), Mr. H. H. Summer's charming tree study, *Near Home*, rightly gained a bronze medal; and Mr. D. G. Riddick's highly commendable wave picture, *Where Grace Darling Won her Fame*, was a clever seascape full of motion. The class, on the whole, was a good one; better relatively, in fact, than B (portraits and figure study), in which, as might have been expected, merit was less conspicuous, a remark that also applies to Class C (enlargements). Here Mr. A. E. Bailey, with *When the Tide has Gone—Ilfracombe Harbour*, showed, probably, the best work, the picture being plucky, well exposed, and carefully printed. In Class D (lantern slides) we are inclined to think the last-named gentleman should have had a higher reward than "commended," his work being very crisp and artistic. In Class H (lantern slides—open) great excellence was displayed, Messrs. Hankin, Farmer, and Carpenter (flower studies) showing remarkably fine work, and, with Mr. T. E. Freshwater (photo-micrographs), securing awards.

Of the open classes, E (landscape, seascape, and architecture) was the most noticeable, Mr. W. Thomas, with his numerous small cattle and sheep and marine studies, again earning the high opinion we formed of his work at Pall Mall. Mr. Francis W. Grant's snap-shots were among the cleverest in the Exhibition. Mr. G. W. Ramsey's *Sunset* (highly commended), a minute but highly realistic study; Mr. C. H. Oakden's really fine series of interiors of Ely, Canterbury, and St. Saviour's, Southwark; Mr. C. Court Cole's Oxford interiors stood out prominently in this class. But, as regards *On the Marshes, Hackney*, by Mr. F. J. Clements, to which the Judges, in their wisdom, awarded a silver medal, we must confess that, despite its pleasing red tone and good selection, it struck us as having been well beaten several times over in its class.

Mrs. S. F. Clarke in Class F (portraits and figure studies) with *Aha*, two charming ladies descending the steps of a terrace, gained a bronze medal for a very delicate and refined picture. There was nothing superior to it in its class, which, however, was not a strong one. In Class G (enlargements, open) we liked the *technique* and the humour of "*Come here, you rascal!*" by Mr. J. H. Gear, which if we mistake not we saw at Pall Mall, and Mr. J. Carpenter's excellent study of *Corn Flowers*. Mr. A. Champion's "*Scene in my Garden*" was an excellent enlargement as one could judge from the small original which accompanied it. Among the pictures sent for exhibition there were many with which we and most of our readers are familiar.

In congratulating the Leytonstone Camera Club on its first exhibition we may bear testimony to the energy displayed by the executive, who deserved and we hope gained success. We shall watch future exhibitions of the club with interest. As a conclusion we may note that the catalogue was embellished with a capital collotype frontispiece of the old house on the site of which the exhibition hall stands, executed by a local firm, Messrs. Webber & Sons.

HACKNEY PHOTOGRAPHIC SOCIETY'S EXHIBITION.

This exhibition was opened on Tuesday afternoon last, November 15, by Sir Albert K. Rollit, M.P., who, in performing the ceremony, made a capital little speech, which, as a rapid survey of the principal aspects of modern photography, left little, if anything, to be desired even from a photographic as distinct from a popular point of view. It is not every member of the Legislature, or, indeed, any other distinguished person who opens a Photographic Exhibition, that can string half a dozen sentences together without exposing a lamentable knowledge of the subject, and, if Sir Albert only knows as much about politics as he appears to do of photography, then is his constituency and his country blessed.

Admirably hung and arranged, and comprising, in addition to a remarkably excellent display of work by the Society's own members, a selection of pictures from the principal photographers of the day, such as in quality we must own to have seen barely excelled either at Pall Mall, the Camera Club, or any recent exhibition, the Hackney Photographic Society's Exhibition may at once be pronounced an unmistakable success. The hall in which it was held is well adapted for the purpose, a by no means common occurrence with photographic exhibitions; and both in *ensemble* and details its stage management, so to speak, does the executive of the Society very great credit.

At the time of writing, the awards of the Judges—Captain Abney, Col. Gale, and Mr. Ralph Robinson—has not been issued, but we should be surprised if in Class A (members: pictures taken since the last exhibition) Mr. S. J. Beckett does not take a medal for his Norwegian series, of which *Sunrise on the Fjords*, in composition, lighting, and richness of tone, is undoubtedly a fine work; with its companion pictures, it is an enlargement from a hand-camera negative. The same exhibitor's *Valley of Odde* is a panorama-like subject, well executed, both as a photograph and an enlargement. In the same class Messrs. J. Carpenter, *Cornflowers and Cypripediums*; Arthur Dean, *Iford Bridge*—a soft and pleasing bit; W. Fenton Jones, *Douglas Harbour*; F. W. Gosling, *An old Doorway Arundel*, and others, contribute good examples.

In Class B, for pictures taken during membership, Dr. Roland Smith's forcible *St. Albans* views; Mr. A. Dean's clever and delicate small work; Mr. Walter Wesson's breezy pictures of *Yachting on the Bure*, catch the eye, and in C (pictures taken at club outings), the pictures throughout are so uniformly excellent that it is hard to separate them. Mr. J. O. Grant's enlargement of the Zoo *Adjutant* is easy, natural, and effective in its treatment of a difficult sitter.

In Class D (portraiture and *genre*), Mr. Robert Beckett, has a series of portraits of which we should give the palm to *Captain de W. Abney* and *A Bethlehem Lady*, the latter especially striking, as as happy in subject and treatment. Mr. G. R. Cleare's portrait of *The Rev. J. de Kewer Williams*, reminds one of Mr. F. Muller's untouched heads, and bears comparison with them, which is high praise. The class is poor in *genre*. There were several classes for lantern slides, in which competition was very keen, and in that for hand-camera pictures Mr. W. P. Dando's exhibits appeared to us as clever as any in a good class.

For such a small class, K (pictures not portraiture and *genre*, open) was of unusual merit, Mr. F. Seyton-Scott's soft dreamy *Kew Gardens*, full of poetry, allied with faultless technique, bearing the stamp of unquestionable skill. In this picture Mr. Scott has happily hit the mean between the two opposing schools of modern landscape photography. There is imagination in the lonely figure pacing *Across the Ploughland* in Mr. Mummery's picture, albeit Dr. Emerson's *Poacher* is irresistibly recalled. Mr. J. A. Hodges, always a good and careful worker, has a charming series, of which the *Shades of Slight*, with its well-managed lights and shadows, is conspicuous as an example of his skill. The best of Mr. Dresser's exhibits is an animated picture of *Amsterdam*, and Mr. A. H. Horsley Hinton shows five of his characteristic landscapes, quite equal to his usual level.

Besides examples of good work shown at Pall Mall and elsewhere by Messrs. Adam Diston, Lyddell Sawyer, S. N. Bhedwar, &c., Class L (portraiture and *genre*), contains many other noticeable exhibits, including *Thoughts over a Pipe* by Robert Terras, a capital head; *Election Time* by J. E. Austin, the subject being the old fellow of the artist's Pall Mall pictures; and two good examples of W. M. Warneuke's large portraiture—*J. L. Toole, Esq.*, and *Miss Alice Kingley*. Mr. W. W. Winter is also largely represented, his best being probably a large portrait of a lady, *Kathleen Mavourneen*, pose, lighting, and expression all alike being very refined. The mauve-like tone of three of Mr. Winter's pictures is novel, but not pleasing. In addition to the now famous series of the *Consecration of a Parsee Priest*, Mr. S. N. Bhedwar shows a fine collection of portraits; and, of the numerous exhibits of Mr. and Mrs. R. B. Lodge, the smaller portrait work is extremely good. Mr. G. Ridsdale Cleare's *Portrait of a Lady*, a nearly, if not quite, life-size picture, is artistically and technically a masterly production. Mr. Byrne also shows several of his exquisite studies of ladies and children.

Messrs. Elliott show their large carbon enlargement of waves, and there is a useful display of apparatus, &c. Among the novelties we noticed were some lantern slides and opals produced by a new print-out process of the Paget Company. On the whole, the Hackney Exhibition deserves to be esteemed as a signal success in all respects.

ON THE METHOD OF EXAMINATION OF PHOTOGRAPHIC LENSES AT THE KEW OBSERVATORY.*

10. *Angle of Cone of Illumination with Largest Stop = ——°, giving a Circular Image on the Plate of —— inches diameter. Angle of Cone outside which the Aperture begins to be Eclipsed with Stop C.I. No. —— = ——°, giving a Circle on the Plate of —— inches diameter.*

Diagonal of Plate = —— inches, requiring a Field of ——° (= 2φ). Stop C.I. No. —— is the Largest Stop the whole of the Opening in which can be seen from the whole of the Plate.

If a stop or thin metal diaphragm with a circular aperture is revolved round any axis passing through its plane, and if it is regarded from a little distance, the whole aperture, foreshortened of course, can be seen except in one position in each half revolution; if in a similar way a piece of tubing is revolved about an axis at right angles to its own axis, there is only one position in which the whole of the aperture can be seen, and any movement from this one position will cause the opening to begin to be eclipsed, thus giving it a lozenge-shaped appearance; as the movement goes on, this opening will get smaller and smaller till it is quite obliterated. In looking through a lens as it is revolved about an axis perpendicular to its own axis, it will be seen that, as a rule, something between these two extremes occurs; commencing from a position when we are looking directly along the axis, no other result than foreshortening the opening is at first produced by the revolution of the lens; then comes an angle at which the aperture in the stop begins to be eclipsed, either by the mounting of the lenses, or by fixed diaphragms, &c.; lastly, we come to an angle at which the lozenge-shaped opening appears to vanish, and no light is seen to come from the lens. It is obvious that the intensity of illumination of different parts of the photographic plate varies with the size of the aperture visible from each point; and, neglecting other considerations for the present, there is thus an inner cone, forming a disc where it cuts the plate, in which the illumination decreases regularly from the centre outwards according to a known law: and there is an outer cone, forming an annulus between where it and the inner cone cut the plate, in which the illumination decreases more rapidly than according to the above-mentioned law; very rapidly, therefore, probably irregularly, on account of the aperture of the stop being successively eclipsed by different parts of the mounting, and certainly according to no law that can be readily stated or ascertained. The test now under consideration gives the angles of these two cones.

The outer cone, which we have called the "cone of illumination," gives the extreme angle of the field of the lens without regard to definition, and is what is known to French authors as the *champ de visibilité*. To find the angle of the cone of illumination, the lens is placed in the testing camera, and the observer looks through the small hole in a sheet of tin plate, with which the ground glass has been replaced, as in the last test; the lens-holder is made to revolve about its horizontal axis, and, as the axis of the lens moves away from zero, first in one direction and then in the other, the positions at which all light appears to be cut off are noted; the angle between these two positions as read on the vertical arc, V, gives the angle of the cone of illumination.

In order to ensure correct results, it is necessary that the axis of rotation should pass through the nodal point of emergence. If, in fig. 3,

FIG. 3.

AN_2N_1a and BN_2N_1b represent the extreme rays forming the cone, N_2 and N_1 being the nodal points, it is evident that, in order to measure the angle bN_1a of the cone, the lens must be revolved about N_1, the nodal point of emergence, as a centre. The necessary adjustment is made in the following manner:—The image of a distant object having been thrown on the ground glass, the lens is turned through a small angle about the horizontal axis, the glass remaining stationary. If the movement of the lens gives rise to any movement in the image, then the axis does not pass through the nodal point of emergence, and an adjustment is necessary. This is done by moving the lens-holder in or out, thus making the axis of rotation pass through different parts of the axis of the lens, until the image ceases to show any movement; and this can only be the case when the axis of rotation does pass through the nodal point of emergence. As far as the above considerations are concerned, it is immaterial how far off the small hole in the tin plate is from the lens, but if the horizontal axis has not been made to pass accurately through the nodal point of emergence this want of adjustment will have much the same effect as a small vertical movement between the two readings of the vertical arc. It is evident that the angular error thus produced will diminish as the distance of the point of observation increases; moreover, any distortion at the edge of the plate will make the above theoretical considerations no longer strictly applicable, and will have the same effect as the axis of rotation not accurately passing through the nodal point. In order, therefore, to minimise these sources of error, the tin plate with the hole in it is removed as far as practicable from the lens before the observation is made.

The angle of the inner cone, that is, of the cone outside which the opening of the stop is partially eclipsed by the mounting of the lens, &c., is measured in the same way as above described for the outer cone, and with the same precautions. When looking through the small hole, the positions on each side of zero at which the aperture begins to be shut off, and beyond which it no longer appears as a perfect eclipse, are easily seen, and the angle between these two positions as measured on the vertical arc gives the angle required. The angles of these two cones are generally given when the observation is made with the largest stop supplied with the lens.

The results of these measurements should be considered in connexion with test No. 17, under which heading the general question of the illumination of the field will be discussed. In order to facilitate the consideration of the covering power of the lens, the diameters of the circles which these cones make by cutting the photographic plate, when the focus is adjusted for distant objects, are given in the Certificate of Examination. Having found the principal focal length in the manner to be described immediately, the size of these circles can readily be ascertained by a simple graphical method, which is hardly worth describing in detail.

In connexion with this test it may be convenient to adopt the use of the term *angle of field under examination* (denoted in this paper by 2φ) to signify the angle subtended at the nodal point of emergence by a diagonal of the plate, or the greatest angular distance which could be included in the photograph, supposing the focus to be taken on a distant object. This angle is found by the graphical method mentioned above for determining the diameter of the circles on the plate, and the result is entered on the certificate of examination.

If the illumination of the field is not to fall off rapidly towards the edges of the plate, for the normal use of the lens we should employ a stop which covers (or nearly covers) the plate of the given size with its inner cone; that is to say, we should use a stop not larger than the largest stop the whole of the opening in which can be seen from the whole of the plate. In order to find the largest stop which fulfils the above conditions, the lens is revolved about the horizontal axis until the vertical arc reads half the angle of field under examination, and then the different stops are put in one by one until the largest one is found which is seen not to be eclipsed when the observation is made through the hole in the tin plate. The number of this stop is recorded in the certificate.

The readings taken when measuring the angles of these cones are also utilised for the purpose of adjusting the position of the lens in a manner necessary to ensure accuracy in several of the following tests:—The vertical arc is so arranged that it reads zero when the axis of the lens is horizontal, that is to say, when the axis passes through the small hole in the tin plate from which the observation is made; hence the two readings on the arc when the lens is revolved about the vertical axis, first one way and then the other, so as just to cut off all the transmitted light, should be exactly the same; if they are not identical, the lens-holder is placed in such a position that the reading on the vertical arc is equal to half the difference between them; then it is evident that the mechanical axis of the objective passes through the small hole, or, at all events, cuts the tin plate on the same level as the hole. Now, this small hole in the tin plate is in the same position as the centre of the engraved line when the ground glass is in position. Hence, this adjustment being made, in future tests we may consider that the mechanical axis of the lens cuts the line on the ground glass near its centre.

11. *Principal focal length = —— ins. Back focus, or length from the principal focus to the nearest point on the surface of the lenses = —— ins.*

The following is the method of finding the principal focal length with

* Continued from page 730.

the testing camera:—By means of the mark 0 (see fig. 1) on the three-legged stool, the swinging beam can be brought approximately to a central position; there are also two iron stops, T and T', removable when not wanted, which, when in position, prevent the swinging beam from passing beyond these points. These stops (or, more accurately, the iron plates on the swinging beam with which they come in contact) are capable of adjustment, and thus a means is obtained of allowing the beam to be revolved about A as a centre, through a known angle, with great ease and accuracy. After the focus has been very carefully adjusted for a distant object, and after the beam has been brought approximately to the central position by means of the mark 0 on the stool, the image either of some well-defined object seen through a hole in the window shutters, or of a mark in the collimating telescope, is made to appear on the centre of the engraved line on the ground glass; this can be done by raising or lowering one or more of the legs of the stool, or by moving it laterally; this adjustment being accurately made, the line joining F, the centre of the ground glass, and the centre of the lens, if prolonged, will pass through the distant mark. When once made, this adjustment will hold good, with sufficient accuracy, for all lenses which may subsequently be placed in the testing camera. Now, when the swinging beam is moved from side to side, the image appears to run along the engraved line on the ground glass; the position of the image is first noted when the beam is in contact with the stop T, and afterwards when in contact with the stop T'; twice the distance, as measured on the scale, between these two points gives the principal focal length of the lens under examination.

In order to ensure accuracy, certain precautions must be taken. The object must be so far off that the distance between its focus and the focus of a point in the same direction at an infinite distance is considerably less than the probable error of observation. The chief difficulty of finding the principal focal length in the Kew method, and, indeed, in all methods, consists in obtaining an accurate adjustment for focus; and since, for a given error in focus, the greater the aperture the more diffusion there is in the image, the largest stop should always be used when focussing; but there is no objection to slipping in a smaller stop after the focus is taken so as to obtain as sharp an image as possible, and thus make it easier to read the position on the scale with accuracy.

Before proving that the result above obtained is, in fact, the principal focal length of the lens, it may be as well to give a rigid definition of what is here meant by that expression, as it has often been used in somewhat different significations. The definition here adopted of the principal focal length is the distance between the principal focus for visual rays (or the image as seen by the eye of an infinitely distant point on the axis of the lens) and the nodal point of emergence. The use of the term *nodal point* is, perhaps, open to criticism; under the ordinary circumstances of a photographic lens, the nodal points and the principal points occupy the same positions, and, therefore, either of these expressions might have been used in the definition; but if we take into consideration any imaginary circumstances when these two points would not be identical, as, for instance, if one end of the lens was immersed in water, it will be observed that the Kew method of determining the principal focal length would find the distance between the nodal points and the ground glass, and not that from the principal point; moreover, under these imaginary conditions, it would be the distance of the nodal point from the plate which would chiefly be of value to the aquatic photographer, for the intensity of illumination of his plate would vary as the square of that distance, and not of the distance from the principal point. But it must be confessed that the term was, in reality, adopted because it is that best known in the photographic world, and not on account of such hair-splitting reasons as these.

It now remains to be seen if the Kew method does give the true principal focal length according to the above definition. In fig. 4, let B, A, and C be three very distant points, A being on the axis of the lens, and B and C being at equal angular distances on either side of it; let N_1 and N_2 be the nodal points; let C', F, and B' be the images of these three points on the ground glass, when, if the distance N_2A is great enough, F will not be further from the principal focus than the error of observation, and may, therefore, be confounded with it. The angle, BN_2C, subtended by the points B and C at the lens, can easily be measured, and, since the incident and emergent rays passing through the nodal points are parallel to each other, the angle $C'N_1B'$ is thus obtained; the distance, C'B', that is, the distance between the images of the two outside points, can be also measured on the ground glass: C'B' and $C'N_1B'$ being given, FN_1 can therefore be found; for since, by supposition, the line AN_2 bisects the angle BN_2C, FN_1 is equal to $C'B'/2 \cot C'N_1B'/2$. This, therefore, is a method by which the principal focal length, as defined above, can be measured. But if, instead of having objects at known angles, only one object is observed, and the camera is revolved round the point N_1, through the angle $C'N_1B'$ between the observations, exactly the same result can be obtained; this is the method adopted at Kew. The movement in parallax of the point N_2 is so small that it may be neglected. The advantage of this method is that a collimating telescope can be used as the object, and thus, during dull weather, the work can be carried on indoors. In working with the testing camera, the angle $C'N_1B'$ represents the angle through which the swinging beam is revolved about the vertical

FIG. 4.

pivot; the stops are arranged so that $C'N_1F = \tan^{-1} \frac{1}{2}$, that is, so that $C'B' = 2\ FN_1$; and, therefore, twice the distance C'B' measured on the ground glass gives FN_1, the principal focal length of the lens. The Kew method, therefore, gives the result required.

It might at first sight appear that a considerable error would be due to the fact that the adjustment to the central position is merely made by a rough mark, and that it is only the total angle $C'N_1B'$ (that is, the angle moved by the swinging beam between the iron stops) which is accurately known. It is true that it can only be said that $C'N_1F'$ is approximately equal to FN_1B'; but if $C'N_1B'$ is less than 90°, and if the line N_1F does not differ in direction from the true central position by more than 1°, then the principal focal length obtained in this manner does not differ from the truth, for this reason, by more than 1/17th per cent. As it is considered that this would represent an extreme case, it is therefore evident that this is a negligible source of error.

In order that the Kew method of finding the principal focal length should not be open to any criticism on theoretical grounds, three conditions must be fulfilled: it is obvious that these conditions need not hold good further from the axis of the lens than the points at which the observations were made. 1st. The principal focal surface, or the locus of the focus for very distant objects, must be a plane. 2nd. The image must not be distorted. 3rd. The nodal point of emergence for visual rays should be the same as the nodal point for actinic rays.

In no lens are these conditions perfectly fulfilled; but, before discussing the nature of the errors thus introduced, it may be as well to consider shortly for what purposes and with what degree of accuracy the practical photographer wants to know the focal length of his lens. Two uses to which this knowledge would or could be put have already been mentioned, and we know of no others. In the first place, it has been shown how the numbering of the stops depends on the focal length, and how advantageous is the knowledge of the intensity of the illumination of the plate which may thus be gained. But as, on account of the difference in the amount of reflection and absorption of the lenses, two lenses with the same C.I. number of stop may differ more than ten per cent. in the intensity of illumination in the centre of the field, as in the same objective the difference of illumination of different parts of the field is generally more than twenty per cent., and, as the photographer is seldom able to estimate his unit of exposure within this latter percentage, it can hardly be seriously contended that the focal length must be known with very great accuracy for this purpose. The second object for which the photographer may require to know the focal length is for the use of the tables in which the distance is given at which the object has to be placed to obtain a given enlargement or reduction; it has already been stated that this is not, we believe, a want often felt, except for getting approximate results; but, if the focal length is used for final adjustments in this manner, it should be known with very considerable accuracy.

With regard to the first condition, as to the focal surface being a plane, it should first be stated that it is found convenient at Kew to bring the ground glass into focus when the swinging beam is in contact with one of the stops, thus ensuring the greatest sharpness of image at the points of observation; that is to say, in Fig. 4, the principal focal surface is made

to pass through the points B′ and C′, and, if it is not a plane, it may be represented by the dotted curve C′F_2B′. Under these circumstances, therefore, the principal focus will be at F_2, and N_1F_2 will represent the principal focal length according to our definition; but it has been shown that the observation gives N_1F as the focal length, thus introducing an error equal to FF_2 in the result. It is to be observed, however, that with a lens giving a markedly curved focal surface, the photographer, in order to get a general minimum amount of diffusion, would adjust his focus by looking at the image at a point somewhat more than half way from the centre to the margin of his plate: for example, with a lens covering 50° or 60°, he would focus at a point some 15° from the centre, or at about the position where the Kew observation for the focal length is taken; thus, with such a lens, C′B′, in Fig. 4, would represent the position of the photographic plate; and it is evident that, for all questions of illumination or enlargement, N_1F, or the distance from the plate to the point from which all the light may be supposed to emanate, should be introduced into the calculations, and will give the true results, or, at all events, more nearly the truth than if N_1F_2, the true principal focal length, had been used in its place. Thus, by recording the length N_1F in the Certificate of Examination, we always give more nearly what the photographer practically wants than if the length N_1F_2, or the true principal focal length, had been ascertained. But, in any case, the point raised in this paragraph could, if thought desirable, be met by focussing the plate in the centre of the field when the observation for focal length is made.

The second point raised, as to the theoretical correctness of the principal focal length as found at Kew, is with regard to the distortion of the image, which may be described as the results due to the theory of the nodal points being not strictly applicable except near the centre

Fig. 5.

of the field. In fig. 5, let N_1 and N_2 be the nodal points, F the principal focus, and B″ and C″ the images of the infinitely distant points B and C; if there is distortion, the lines SB″ and SC″, drawn parallel to the incident rays, do not cut the axis at N_1, the nodal point of emergence: let these lines cut each other at S, which may be called the principal point of similitude with regard to the images B″ and C″. This construction represents the Kew method of observation, and therefore SF is the distance found as the principal focal length, thus introducing an error equal to SN_1 in the result; the focal length given is, in fact, the distance from the principal focus to the principal centre of similitude for the part of the plate where the observation is made. But here again, since BN_2C, the cone of incident rays, is spread over a disc on the plate of which B″C″ is the diameter (and not B′C′), the mean intensity of illumination of the plate between these points will vary inversely as $(SF)^2$; and, if the plate covers an angle larger than BN_2C, the C.I. numbering of the stops will give a better indication of the relative exposure on the assumption that SF is the principal focal length than if the true value N_1F is introduced into the calculations. Thus, what has been given in the Certificate of Examination will again be nearer what is practically required by the photographer than if the true principal focal length has been recorded. If, however, the lens is intended to be used for enlargements or reductions, and the final adjustment of the distance of the object is to be made by reference to tables, then, no doubt, the true principal focal length must be accurately given; but no photographer would ever use a lens showing sensible distortion within 15° of the axis, for such purposes, for, if he did, the ratio of the enlargement or reduction would vary sensibly in different parts of his plate; and, if there is no distortion within this distance from the axis, S and N_1 will be coincident, and the Kew method will give accurately and truly N_1F as the principal focal length. Thus, in the only circumstances under which the principal focal length is practically wanted with theoretical truth and great accuracy, it is seen that the results given in the Kew certificate do answer these requirements.

Leonard Darwin, Major R.E.

[To be continued.]

Our Editorial Table.

The "Lecturer" Candle Lamp for Lantern Readings.

This lamp, which is manufactured by Benham & Froud, Limited, forms a useful companion to the lantern. It is constructed on the same principle as their now well-known "Perfection" and "Holiday"

lamps, that is to say, the light from a special candle, which is kept *in situ* by a propelling spring, falls upon a parabolic reflector which, directs the rays downwards as shown by the cut, instead of in a horizontal direction as in the others.

As candles only are employed, the disadvantages of oil are absent. There is a red signal flash provided for by touching a milled-head button to let the exhibitor know when the lecturer desires a plate to be changed. No light escapes into the exhibition-room. The lamp packs up for travelling into the space shown in the second illustration. We have tried the "Lecturer," and find it to be a really useful addition to the *impedimenta* of the lantern exhibitor.

Photo-micrography.

By Edward C. Bousfield. London: J. & A. Churchill.

This forms a second edition of a work by which the author acquired a high reputation as a sound writer on a subject possessing both interest and educational value. It has been rewritten, greatly enlarged, and brought up quite to date. In the chapter devoted to plates and development, Mr. Bousefield considers it a mistake to use very rapid plates, as with slow ones the latitude of exposure is greater and the risk of fogging less. Photo-micrographic cameras are shown and their characteristics described, while of stands there are not a few. Object glasses, oculars, and condensers are all discussed with due fulness, although he considers that a condenser as free from spherical and chromatic aberration as an objective of good quality is still a desideratum. The nearest approach to it is probably to be found in using as a condenser an objective of somewhat lower power than the one attached to the microscopic tube.

There is so much that is good and practical in this work (which contains many illustrations) that it can be strongly recommended to all who purpose devoting themselves to this department of photography. 174 pages.

The Optimus Lantern Objective.

This new lens, by Messrs. Perken. Son, & Rayment, has a singularly flat field combined with great brilliance of the image. The corrections by which these properties have been secured have not been obtained at the cost of its utility as a *carte* portrait lens, for the coincidence of the chemical and visual foci, not always found in some lantern objectives, is here perfectly achieved. The form of the combination is essentially that of Professor Petzval's, subject to slight alterations consequent upon the improvements recently effected in optical glass. Although for lantern purposes it works with full aperture, yet it is provided with a case of stops to serve the purposes of copying or ordinary photographic portraiture. The lenses are two inches in diameter, with an equivalent focus of six inches.

Trade Catalogues, &c., Received.

E. G. Wood's (74, Cheapside) catalogues of slides, optical lanterns, and dissolving-view apparatus (144 pages) contains no fewer than 122 pages devoted to lists of slides duly classified, the remaining portion containing descriptions of apparatus.

In the catalogue of J. H. Steward (406, Strand), while there is a considerable portion devoted to slides, yet does the apparatus section preponderate. It includes several specialities of Mr. Steward.

The ability of W. C. Hughes (82, Mortimer-road, N.) to compile a wondrously large catalogue of lanterns and appliances is not growing less. His new one is very large and comprehensive. It contains, as a supplement, a clearance sale list of lanterns, slides (coloured and plain), jets, and other apparatus, at considerable reductions from the original prices.

A catalogue just received from C. C. Vevers (Leeds) is, like those just previously mentioned, devoted exclusively to "magic and optical" lanterns, slides, and accessories, although a supplement consisting of new apparatus to his photographic catalogue accompanies it.

In this month's number of Fallowfield's *Remembrancer*, as might be expected from the season, is catalogued much that relates to the optical lantern and to flash-lamps, as well as to albums, scrap-books, and job lines.

The Provisional Catalogue of Newman & Guardia's (71, Farringdon-road, E.C.) hand cameras and shutters contains a description of their changing box and carriers, together with their aluminium blind shutter with Newman's automatic pneumatic regulation.

Outlines of Organic Chemistry.

By Clement J. Leaper, F.C.S.

This work, which is professedly written for schools and classes connected with the Science and Art Department, is, we gather from the preface, laid down on such a plan as to take up about fifty hours, viz., twenty lectures of an hour's duration, and twenty laboratory practices, each lasting an hour and a half. In each of the twenty chapters experiments are described, terminating with a few questions arising out of each. We have on a previous occasion expressed our sense of the ability and talent of the author as a writer of works cognate to the present, and have now merely to add that for students of organic chemistry this small volume will prove eminently useful. It is published by Iliffe & Son, St. Bride-street, E.C. 120 pp. Price 2*s*.

Field-path Rambles round Bromley.

By Walker Mills. R. E. Taylor & Son, 19, Old-street, E.C.

This little pamphlet, descriptive of possible ramhles in the charming Kent country near London should not only prove useful to pedestrians, but also to photographers in search of the picturesque. It is, we gather, to be followed by others.

Messrs. Sharp & Hitchmough, Liverpool, send us a sample piece of their "Aptus" opaque lantern screen, prepared with a special flexible material on strong canvas. This will prove a serviceable screen, being white, durable, and not likely to get creased. Other screens issued by this firm, *e.g.*, their washable cloth, one which is made in one piece up to eight feet and mounted on rollers top and bottom, will also prove useful.

THE MADDOX TESTIMONIAL FUND.

After a good deal of accidental but unavoidable delay the Testimonial expressing the sentiments of the subscribers to the above Fund has been sent to Dr. Maddox, the cheque alluded to having been handed over to him many months ago. The actual sum is somewhat in excess of 400*l*., as a few subscriptions came in after the Fund was closed; but these amounts have been passed on to the solicitors of Dr. Maddox, and have been added to the subscription list, which was not circulated among photographers of Great Britain and the United States, but covered the Continent of Europe, India, &c. When the latter list is closed we hope to intimate to the photographic public the result of the appeal to countries other than those included in this present notice.

The Committee thank the subscribers heartily for their handsome response to the appeal, and it must be a pleasure to all to know that the gift was of much use to Dr. Maddox, and is accepted by him with great gratitude.

The following is a copy of the document, which is on parchment, and neatly illuminated. Andrew Pringle, *Hon. Secretary*.

This Testimonial is presented to Dr. Richard Leach Maddox with a cheque value 400*l*.—four hundred pounds—raised by voluntary subscriptions in Great Britain and the United States of America, in recognition of his services to photography, and especially of his investigations in connexion with gelatine emulsion. Signed on behalf of the subscribers by the Committee:—

James Glaisher, *Chairman*.	A. Clifford Mercer.
W. de W. Abney.	Henry Sturmey.
W. S. Bird, p.p. the Autotype Co.	J. Traill Taylor.
G. Davison.	W. H. Walker.
A. Haddon.	H. T. Wood.
A. H. Harman (for the Britannia Works Co).	Frederick York.
	Thomas Bedding.
Charles W. Hastings.	Francis Cobb, *Hon. Treasurer*.
T. C. Hepworth.	Andrew Pringle, *Hon. Secretary*.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
November 21 ...	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
„ 21 ...	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
„ 21 ...	Hastings and St. Leonards	
„ 21 ...	Leeds (Technical)	Mechanics' Institute, Leeds.
„ 21 ...	Richmond	Greyhound Hotel, Richmond.
„ 21 ...	South London	Hanover Hall, Hanover-park, S.E.
„ 22 ...	Great Britain (Technical)	50, Great Russell-st., Bloomsbury.
„ 23 ...	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
„ 24 ...	Camera Club	Charing-cross-road, W.C.
„ 24 ...	Hackney	206, Mare-street, Hackney.
„ 24 ...	Halifax Photo. Club	Mechanics' Hall, Halifax.
„ 24 ...	Hull	Royal Institution, Hull.
„ 24 ...	Ireland	Rooms, 15, Dawson-street, Dublin.
„ 24 ...	Liverpool Amateur (Annual)	Crescent Chambers, 3, Lord-street.
„ 24 ...	London and Provincial	Champion Hotel, 15, Aldersgate-st.
„ 24 ...	Oldham	The Lyceum, Union-street, Oldham.
„ 25 ...	Cardiff	
„ 25 ...	Holborn	
„ 25 ...	Maidstone	"The Palace," Maidstone.
„ 25 ...	Swansea	Tenby Hotel, Swansea.
„ 25 ...	West London	Chiswick School of Art, Chiswick.
„ 26 ...	Putney	High-street, Putney.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

November 10,—Mr. E. W. Parfitt in the chair.

Questions.

The following question from the box was read: "I developed two under-exposed plates, and intensified them by bleaching them with a solution of mercuric chloride, 100 grains; potassium bromide, 100 grains; water, 10 ounces; then washed for several minutes and immersed in a solution of silver nitrate, 100 grains; water, 10 ounces; with sufficient cyanide of potassium to dissolve the precipitate. One negative is of a reddish colour, while the other is black and white by reflected light, and slightly red by transmitted light. Can any one account for this? Is it due to insufficient washing previous to intensification?"

Mr. W. E. Debenham could not see why one colour more than another should make any difference in the printing so long as the shadows were clear, neither did he find it so.

It was understood that the question should be deferred for the production of the negatives.

Question No. 2: "Could wash-leather be employed to make the valve of a gas cylinder gas-tight?"

Mr. T. E. Freshwater observed that, if the cylinder was not properly valved, no wash-leather would stop the gas.

Question No. 3: "What is the best developer for photomicrography?"

Mr. FRESHWATER always used pyro-ammonia, and said that the plate should be thickly coated.

LITHIUM TONING BATH FOR GELATINO-CHLORIDE.

Mr. C. H. COOKE exhibited several prints on Eastman Solio paper toned with a bath consisting of—

Gold chloride	2 grains.
Lithium carbonate	1 drachm.
Water	8 ounces.

The bath was ready for use as soon as made. He washed the free silver out of the prints before toning.

The CHAIRMAN said the prints had a nice tone.

UNIFORMITY OF RESULT WITH GELATINO-CHLORIDE PAPER.

In reference to a brief discussion on this subject at the previous meeting, Mr. JOHN HOWSON said that uniformity of result on gelatino-chloride paper could be as readily obtained as with albumen, given the same amount of knowledge of the subject. He would show some results as obtained by a professional photographer, consisting of four or five dozen prints which were "overs" in the studio work—that is, a man may have ordered two or three dozen copies, and the photographer had printed two or three dozen over. He thought the prints showed that uniformity of tone could be as readily obtained as with albumen. Of course, gelatino-chloride was somewhat new, and there was something to learn; but with the necessary experience it was just as feasible to get uniformity of tone with gelatine as with albumen.

The prints shown were the work of Mr. Midwinter, of Bristol, to whose method of working gelatino-chloride, as detailed in a recent number of this JOURNAL, Mr. Howson made reference.

Mr. J. R. GOTZ remarked that he had seen many albumen prints blue in the lights.

Mr. C. H. COOKE asked if the colour of the pictures could not be altered?

Mr. HOWSON said this might be done by toning for a shorter time. They could have a range of tone from warm brown to purple black.

Mr. DEBENHAM said many experienced a difficulty of this kind—that the prints would appear reddish-brown and then go into the blue stage.

Mr. HOWSON said this would happen if the toning bath were too rapid. The bath to be in proper working order should be two-thirds old and one-third new, and the toning could then be stopped at any stage.

Mr. J. R. Gotz exhibited and described his Kangaroo changing box. (This was fully described in a recent number.)

AMIDOL.

The CHAIRMAN said he had been making some experiments to ascertain if amidol gave a greater amount of detail or increased the sensitiveness of plates more than other developers. He passed round seven plates which had each had fifteen seconds' exposure to a sensitometer screen at a distance of six feet from a Bray's No. 7 burner. The plates had been developed with different developers, his conclusion being that there was no more to be obtained by using amidol than pyro and carbonate of soda.

Mr. HOWSON certainly found that for studio work amidol was preferable in some respects to any other developer he had come across. It seemed to give somewhat better results in detail in the shadows without the high lights being blocked. One defect, especially for lantern work, was that it did not yield density nearly so readily as pyro-soda without prolonged development; therefore he would not use it except for normal development and exposure, because in prolonged development of under-exposure one would be apt to get fog. It was, besides, absolutely necessary to use a small amount of bromide as a restrainer, say, half a grain to one ounce of solution, otherwise one would be bound to get fog with the stock solution with most plates he had tried. If he had plates to develop of which he was in doubt, he would certainly use pyro-soda in preference to amidol. For bromide paper and for lantern plates it certainly had advantages over hydroquinone or any other developer he had met with. He would not recommend it in preference to ferrous oxalate, but it was better than hydroquinone, as it did not clog the shadows, and the deposit of the image had an exceedingly fine grain.

The CHAIRMAN having mentioned the difficulty of keeping a stock solution of amidol without discolouration,

Mr. P. EVERETT suggested that a stock solution of the sulphite of soda be kept and the amidol dissolved in it as required for use.

FLASHLIGHT PHOTOGRAPHY.

Mr. E. MILNER, being unable, owing to an unavoidably late arrival, to deliver his promised paper on *Outdoor Experiences* (which was consequently postponed for a fortnight), was invited to speak on *Flashlight Photography*. He said he had that evening taken the Exhibition of the Leytonstone Camera Club by means of a continuous flash-lamp of his own invention and a screen. It was a one-flame lamp. He had recently exposed a plate with it at the Adelphi Theatre for three seconds, with the lens at *f*-32, and got a very well-exposed picture indeed. The picture at Leytonstone Camera Club had less exposure than this. The lamp would consume three or four drachms of magnesium in three seconds, an ounce not lasting more than thirty-five seconds. He had tried aluminium, but could not burn it. With his lamp the magnesium could either be burnt quickly or slowly. The flame was about two feet six inches high and one and a half feet across.

The meeting then terminated.

Holborn Camera Club.—November 11, Mr. E. H. Bayston in the chair.—Mr. W. E. Debenham gave a lecture and practical demonstration on *Transparencies by the Carbon Process.*

North Middlesex Photographic Society.—November 14, Mr. F. W. Cox in the chair.—About forty-five members were present. Mr. J. Traill Taylor addressed the Society on Photographic Optics. He said that in preference to giving a lecture, he would have a gossip with the members on the various types of photographic lenses. The "gossip" took the form of an account of the different forms of lenses which had from time to time been evolved. Beginning with the simple bi-convex lens used in the camera obscura, he exhibited examples of the various lenses in the chronological order in which they have been produced, the earlier examples having been ground, the crown from window bull's-eyes, and the flint from bottoms of tumblers. He explained, by aid of the examples and by the blackboard, the effect of the different curves and combinations, and showed that in the earliest examples some of the latest inventions had been forestalled. He showed the tele-photographic lens, and the lenses from an opera-glass, with which he had made his experiments in 1868, and the results of which were given in the ALMANAC for 1869, and gave valuable information to those who desired to modify their lenses for emergencies. He pointed out that, in constructing a tele-photographic lens, it was necessary that, when the image-forming lens and the lens of negative focus were laid one on the other, the combination should make a diminishing glass. Prints of breaking waves, taken with a spectacle lens by Mr. Henry Sutton, were shown. Much interest was taken in the types of lenses exhibited, and particularly in the spectacle lens used by Mr. Taylor when he first began photography. Several questions were asked and fully answered, and a vote of thanks to the lecturer carried with acclamation. The remainder of the evening was devoted to making arrangements for the annual Exhibition, to be held on Monday, the 28th inst.

Hackney Photographic Society.—November 8, Mr. A. Barker in the chair.—Mr. William Smith showed Tylar's new form of lantern slide carrier (which was afterwards successfully worked in the lantern) and lantern slide printing frame. A question was asked as to why a reduced slide showed unevenly and dark in centre. The HON. SECRETARY said if artificial light was used probably it was caused through the light being held too near to the negative. Mr. Smith asked whether opal was better than ground glass for this work. Mr. BECKETT observed that it stopped the light somewhat more, but the illumination was better. The Hon. Secretary announced that the next ordinary meeting would be on the 22nd, when the Autotype Company had promised a demonstration.

Putney Photographic Society.—November 7, Dr. Sheppard in the chair.—Mr. BUCHANAN WOLLASTON gave a lecture and demonstration on *Platinum Printing Processes.* The lecturer stated that the "hot bath" was now practically a thing of the past, being superseded by the new cold-bath process. He claimed for the latter several advantages, among which were superior keeping qualities, greater simplicity of manipulation, and more control over the results. Unlike the hot-bath process a good print could be made from practically any negative, in fact, he had found that, by modifying the method of printing, the developer, and its application, an excellent result could be obtained from a negative that would not give a passable print by any other process. Mr. Wollaston laid special stress on the absolute necessity of keeping the paper bone dry before, during, and after printing, if full advantage were to be taken of its capabilities to give brilliant results. For this purpose the paper must, until development, be stored in special boxes containing calcium, care being taken that, as soon as the calcium becomes softened by the absorption of moisture, it should be taken out and thoroughly dried. In order to keep the paper dry during printing, it is also absolutely necessary to use a vulcanised rubber pad placed in contact with it in the frame. Results depend very largely on these precautions being carefully observed, for, should the paper have absorbed moisture, there will be a corresponding tendency to mealiness, appearance of grain in the shadows, and a general lack of vigour and brilliancy in the print. In the hot-bath process the difficulty of judging the depth of printing was not infrequently found to be a stumbling-block to the beginner, but, as the new paper may be printed until full detail is fairly visible, no great difficulty should be experienced in this direction. Mr. Wollaston said that very thin negatives might with advantage be printed under blue, and hard ones under signal-green glass, and that printing generally be done in a bright diffused light by preference. The prints can be developed by immersion, floating, or by brush. The two former require no explanation, but it should be noted that they usually give cold tones. The lecturer evidently prefers to develop by the brush, as by this method he has more command over the development, and thereby obtains a fuller scope for the artistic treatment of the subject. The normal developer consists of oxalate of potash, one pound dissolved in fifty-four ounces of hot water. For use this should be diluted by adding an equal quantity of water. For brush development, the addition of glycerine in the proportion of one part normal oxalate developer (one pound to fifty-four ounces), one part of glycerine, and two parts of water, was recommended. Mr. Wollaston then proceeded to develop prints by the brush method. In order to keep the paper flat it was temporarily mounted on a slab thinly coated with plain glycerine. The developer was then applied by means of a camel's-hair brush, which was wetted with fresh developer between each stroke, care being taken that each succeeding stroke should overlap the previous one. Should any part of the print now be seen to require strengthening, a developer without glycerine should be used for the purpose. Should it be anticipated from the nature of the negative that any part has been over-printed, detail and transparency in the shadows can be retained by first covering those parts of the print with a thin layer of plain glycerine rubbed on evenly with the finger, the development being afterwards proceeded with in the usual way. Still further control can be obtained by covering the whole of the paper with plain glycerine previous to development. It will be understood that the glycerine acts as a retarder, much the same as bromide acts in an ordinary developer, and it should also be noted that length of development tends to produce warmth of tone. Should it be desired to vignette the picture, it can be done to any shape in an artistic manner and with great ease by simply omitting to apply the developer to the parts that are desired to remain white, the softening of the edges being done gradually, or by cross hatching in the manner of a crayon drawing. The vignetting may be done after the picture has been printed to the edges. When development has been completed, the prints, without previous washing, are immersed face downwards in a bath of dilute *pure* hydrochloric acid (one part to sixty parts of water), and allowed to remain for five minutes, then removed to a second acid bath for about ten minutes, afterwards to a third for about fifteen minutes. The prints must be finally washed in at least three changes of water for about a quarter of an hour.

A pinch of washing soda should be added to the second water. The prints are then dried in the usual manner.

West London Photographic Society.—November 11, the President (Mr. John A. Hodges) in the chair.—Five new members were elected. Mr. E. J. Wall read a paper on *A Comparison of Printing Processes.*

Bolton Photographic Society.—November 9, Mr. William Banks in the chair.—Mr. S. G. BUCHANAN WOLLASTON gave a lecture on *The Powers of the Platinotype Company's new Paper for Cold Development*, illustrated with a practical demonstration of the various methods of modifying the developer, and showing how completely the image could be held in control.

Leicester and Leicestershire Photographic Society.—November 9, the President (Mr. F. G. Pierpoint) in the chair.—Mr. THOMAS SCOTTON, of the Derby Society, then gave a demonstration of the *Cold Bath Platinotype Process*, prefacing his demonstration with a lucid description of the various processes. The demonstration was perfectly successful, and exceedingly interesting and useful, the principle of retarding development locally by the use of glycerine applied to the part desired to be retarded was very markedly demonstrated. After the demonstration the PRESIDENT (Mr. Pierpoint) read a paper entitled, *A Tour through the Dukeries*, illustrated with some well-executed slides.

Liverpool Amateur Photographic Association—November 10.—Mr. C. F. BUDENBERG, of the firm of Schaeffer & Budenberg, Manchester, gave a lecture before this Society upon the subject of *High-Pressure Gas Gauges*, illustrated by experiments with apparatus, which the lecturer brought for the purpose. Mr. Budenberg explained that there was no occasion for the least risk of danger in the use of a gauge so long as the user took care to ascertain that he got a well-made article. He stated that, while inferior gauge-tubes were made out of ordinary drawn steel tubing roughly finished, the reliable instruments were made from pressed octagonal steel bars bored, and afterwards carefully turned, and polished inside and outside. By fixing one of each kind of instrument upon a pressure-pump, he showed that the first was strained and rendered unreliable by being submitted to the ordinary pressure, and would easily have burst if the pressure had been slightly increased; but the second, after a pressure of several tons, returned to its original position without showing a fraction of displacement. Mr. Budenberg then referred to chemical explosions which had been caused by turning the full force of oxygen into a gauge in which traces of oil remained. The intense heat generated by the sudden rush of gas rapidly consumed the oil, and an explosion was the result. This action was shown by placing a piece of wood in a brass tube, which was attached to a cylinder charged with air. When the valve was suddenly opened the rush of air ignited the wood. The best gauges, the lecturer explained, were now made with a check, to prevent this sudden inrush of gas, so that, even if they were charged with inflammable oil, an explosion could not result. His firm, however, did not allow oil to touch their gas-gauges. Mr. Budenberg strongly deprecated complicated connexions with cylinders, his opinion being that the connexion between the cylinder and the regulator should be as short and as simple as possible.

Manchester Photographic Society.—November 10, the President (Mr. Abel Heywood) in the chair.—Mr. W. N. Sherburn was elected a member. The President showed a very simple contrivance for holding sheets of paper during drying. It was an article introduced to the printing trade, but Mr. Heywood considered it a very good arrangement in place of the American clips usually used to suspend prints. The appliance consisted of a rail of wood about $2\frac{1}{2} \times \frac{3}{4}$ inches, having on one edge a series of oval-shaped fret cuts, in each of which were retained loosely by tinned crossed wires common marbles or, as schoolboys term them, "alleys." A sheet of paper pushed up into one of the slots or cuts is held securely by the marble pressing against the edge thereof, and cannot be removed by a downward pull, which only tends to tighten the grip of the marble, but a slight side pull easily removes the sheet. The same arrangement is made in single squares of wood, having one paper-holder and a spiral fret to enable the square to be slung on a line. The remainder of the evening was devoted to a discussion on lantern slide making, Mr. J. Wood and Mr. Whitefield giving a very full account of their methods, which were directly opposite, Mr. Wood's plan being to give a full exposure and rely on modifications of his developer, whilst Mr. Whitefield relied on varying the exposure and using a normal developer. A number of the members contributed to the discussion, the majority being in favour of eikonogen or eikonogen modified with hydroquinone for developing. The result of the discussion showed that care in the manipulation was the main factor, as the exhibition of examples showed good results by very varied methods. Mr. Whitefield gave the following formulæ for developing for line work when good black lines on a clear ground were required, though not quite equal to wet collodion. The results were very good, and better than the usual method of treatment:—Hydroquinone, 4 grains; potassium bromide, 2 grains; sulphate of soda, 12 grains; sodium hydrate, 4 grains; sodium carbonate, 12 grains; made up to 1 fluid ounce with water. Use good plates, develop fully, and clear with the alum and acid bath.

National Association of Professional Photographers.—A meeting of the Council of the National Association of Professional Photographers was held at Anderton's Hotel, Fleet-street, E.C., on November 9, Mr. Thomas Fall in the chair.—The PRESIDENT said that it was most difficult to fix a time and place for meeting that should suit the convenience of all members, and that, though there was such a representative gathering from all parts of the country, he regretted the unavoidable absence of many. Several of those who were unable to attend had written most hopefully and encouragingly. He then dealt with the case of a firm of enlargers who had refused to agree to the Association's terms *re* prices "for the trade only." Several members strongly expressed their opinions on the subject, and, while regretting that the Association did not include practically the whole of the profession, which would enable it to bring such a house to reason, pointed out that there was only one course for members to adopt, and that even a couple of hundred of the principal men could exert some appreciable influence. Mr. J. CROSBY (Rotherham), followed by Mr. J. HUBERT (Hackney), strongly urged the necessity of increasing the numerical strength of the Association. Mr. Crosby said that Leeds, Sheffield, and Hull had formed local centres, but that, until they had the substantial support of London, solid progress was impossible. The SECRETARY read his report of work done since February last, in which time fifty new members had been added to the Association. He reported on the visit paid by the President, Mr. Whitlock, and himself to the Convention, which had resulted in the acquisition of a few members. He had personally canvassed Birmingham, Wolverhampton, Newcastle-on-Tyne, Sunderland, and other towns, and had three times met the executive in London without any expense falling upon the Association. Mr. W. GILL (Colchester) said that one volunteer was worth two pressed men, and that it was possible to do too much in the way of canvassing folks who were unwilling to join. He thought more attention should be turned to making the Association of greater practical value, and to making its value more apparent, so that outsiders would not need pressing to come in. Mr. MARTIN (London) said that the idea of *esprit de corps* should be pressed forward more than mere money or business advantage. Mr. J. HUBERT (Hackney) said that, though a previous speaker had disparaged personal canvass, he thought that a personal application would show the value of the Association to many men who had simply not troubled to consider about it. For his own part, he would canvass his own district, and report results to the next meeting. He urged other members, especially those in London, to do the same, and added that he was sure all the London men worth having would be solid in favour of the Association if its objects were personally explained to them. If no other London men would undertake the work, he would devote all his spare time to it, and, if necessary, continue his labours in evenings and other odd times, until he had worked the whole of London. (Applause.) Mr. H. J. Godbold (Hastings), Mr. Spink (Brighton), and other members promised to canvass their own districts. The PRESIDENT said that, so far as he had been able to call upon the men in the West End, his success had been beyond his anticipation. Perhaps the bill of fare presented by the Association had not been so attractive as it might have been. They had thought it well to simply attempt the gathering of a strong body of photographers who should decide the channel in which to direct their practical efforts, rather than to attempt to redress abuses before they knew what strength they had to rely upon. They had done some work in the past, which had been reported from time to time, but now, perhaps, they might offer further advantages. As Mr. Gill had said, they must look to the young men, and to these he would point out that membership of the Association, which enabled them to seek and to obtain the advice of many of the leading men in the profession, was in itself valuable. He (the President) would have liked to see professionals more generally eager to join the Association, but he was very well satisfied when he considered the character of the membership. They were not a heterogeneous mass, but representative men from all parts of the kingdom, and formed an excellent nucleus for a strong and vigorous organization. A suggestion had been received from Mr. H. Snowden Ward, who was not a member of the Association, that the Commissioners of the World's Fair Congress on Photography would appreciate the appointment of one or more delegates from the National Association of Professional Photographers. It was proposed, seconded, and unanimously carried that the President, and Messrs. Charles H. Evans, W. Gill, and W. Battersby be delegates to represent the Association, and to report on the proceedings of the Congress. It was proposed by Mr. W. Gill, seconded by Mr. Bromwich, that the thanks of the Association be tendered to the Manchester *Spy* for its exposures of the doings of Mr. Sauvy, a Manchester photographer. The subject was commented on by several members, including the President, who said that, though photographers were no better than other men, he thought that the photographers of London would not have suffered such a man as Sauvy to remain amongst them so long as their Manchester brethren had. If the rumour that Sauvy had returned from his flight were true, he hoped that Manchester photographers would not rest until they had made it impossible for such a man to continue in business. The vote was unanimously carried. It was proposed by Mr. J. Crosby, seconded by Mr. Glaisby, that the next annual meeting be held in Manchester.

Aberdeenshire Amateur Photographic Society.—The progress made by the Aberdeenshire Amateur Photographic Society, which has been but a little over a year in existence, is evidenced both by the variety and the merit of the Society's first competitive exhibition which opened on November 12. The majority of the photographs were shown in handsome frames, and in some cases the mounting was very artistically carried out. The prints represented all the different methods of photographic reproduction—silver, bromide, platinotype, printing-out paper, and carbon; and a number of the figure studies and scenes and portraits were of exceptional interest, both as regards artistic treatment and technical execution. The prints were judged by Messrs. Ewing and Morgan, whose awards were as follows:—Class 1, half-plate landscapes, silver medal, L. M. Gibb, Victoria-street; bronze medal, E. L. Brown, 2, Esslemont-avenue; highly commended, E. L. Brown, 2, Esslemont-avenue; commended, L. M. Gibb, Victoria-street. Class 2, whole-plate landscapes, silver medal, J. Milne, Devanha-terrace; bronze medal, W. Gibson, London; highly commended, W. Gibson, London; commended, J. Milne, Devanha-terrace. Class 3, portraiture and figure study, silver medal, J. Milne; bronze medal, W. Gibson, London; highly commended, J. Milne; commended, E. L. Brown, 2, Esslemont-avenue. Class 4, seascape and river scenery, silver medal, J. Milne; bronze medal, W. A. Hawes, Gilcomston-park; highly commended, W. A. Hawes, Gilcomston-park; commended, W. T. Moffatt, Beaconsfield-place. Class 6, enlargements, silver medal, W. Moffatt, 7, Queen's-gardens; bronze medal, W. Ramsay, Dyce; highly commended, J. Milne, Devanha-terrace; commended, J. Anderson, Cults. Class 7, hand camera work, bronze medal, E. T. Smith.

Edinburgh Photographic Society.—This Society opened its annual exhibition of members' work, combined with a series of the best attainable loan work, on Thursday, November 10. They are to remain, for a fortnight, freely open to members and the public. The meeting was opened in the somewhat novel way of holding a smoking concert, at the commencement of which Mr. ALEXANDER AYTON (Vice-President) said that this meeting was somewhat of a new departure, and as this was his first appearance in the chair, he took the opportunity of thanking them for placing him in the position. He stated that it was the first social evening the Society as a body had held, and he thought the movement was one which should be encouraged and repeated.

An attempt was to be made by the Council to increase the utility and extend the usefulness of their meetings and their work as a body; they intended this to be a working session, and had appointed a committee to organize a lantern section, which would hold a monthly meeting for lantern work only. There was also to be a series of lectures and experimental meetings for the benefit of the younger members of the Society, but which would not interfere with or clash with the ordinary monthly meetings. They were now in the proud position of having a membership—over 400—by far the largest in the United Kingdom, and they had also any amount of talent in the body, which the Council intended to make full use of to bring it out—in fact. With the encouragement they had got, they thought they might face the question of making the exhibition an annual one, and there was no reason why they should not have one that would rival that of the parent Society in Pall Mall, London. During the evening a number of songs and recitations were given by Messrs. Crooke, Lumsden, Gardner, Boswell, and others. The exhibits are divided into four classes:—I. Those pictures sent for exhibition only, and those got by the Council, which have already secured high awards elsewhere. II. The pictures taken during any of the 1892 Saturday rambles. III. Figure studies from negatives, taken since 1st November, 1891. IV. Landscapes from negatives, taken since 1st November, 1891. The best picture of each of the three latter classes are to have medals awarded. The pictures in these three classes number about 200, and the method of awarding judgment is by the member filling up a schedule, copies of which are lying in the rooms and must be filled up before November 22, 1892. It takes this form, which might with advantage be copied by other societies.

In my opinion, the best pictures are as under:—

Class II.	*Class III.*	*Class IV.*
No.	*No.*	*No.* .....

Then follow member's name, address, date. The pictures themselves are only distinguished by a number, and the author by a motto or *nom de plume*, so that, except by the mannerism of the artist, all knowledge of the personality of the producer is cut off. Nothing could be devised better adapted to get the true opinion of those members who visit the rooms, and care to give their judgment after having examined the pictures. Mr. F. P. Cembrano has sent four landscape studies, printed in platinum, on rough paper, which have taken first-class awards at exhibitions in London, New York, Amsterdam, and Brussels. The pictures have a characteristic Corot effect. Mr. W. Bedford has sent duplicates of three pictures lately exhibited in the Pall Mall Exhibition of the London Photographic Society. Printed in carbon, of sepia tint, and on rough paper, they have all the appearance of the work of an old Dutch master. Mr. George Davison, President of the Photographic Convention of Great Britain, sends twelve landscape pictures of the Emersonian school. Mr. Ralph Robinson sends three large pictures—landscapes with figures—which will be useful to the members as studies in composition. Mr. Lyddell Sawyer sends two large figure compositions subjects, which illustrate the charming effects that may be produced by attention to lighting; Mr. F. Sutcliffe, a series of very beautiful landscape enlargements; and Mr. Adam Diston, a few exhibits of composition *genre* subjects. Of the work of the members, the most striking, is the large group of the Photographic Convention, which was taken in Princes-street-gardens, Edinburgh, by Mr. Ayton, the chairman. Though there are over 130 figures in the group, each is a good portrait.

Edinburgh University Photographic Society.—The annual business meeting was held in the Society's rooms, Bristo-street, which have been renovated and improved during the recess. The expense, we understand, has considerately been borne by several of the professors who take an interest in photography. The Professor of Chemistry (Dr. Crum Brown) presided. He called attention to the exhibited works of the members, and urged close attention to the scientific, as well as to the artistic, side of this fascinating study, than which no young man could have a better hobby, or one more likely to lead to steady improvement of mind and morals. The evening concluded, after appointment of office-bearers and hearing and adopting Secretary and Treasurer's reports, with a friendly criticism of the members' work as exhibited.

Glasgow Photographic Association.—November 3, Mr. William Lang, jun., F.C.S. (President), in the chair.—Messrs. A. B. Fulton and James McGlashan were elected members, and the office-bearers for session 1892-93 were appointed. Mr. J. Craig Annan read a paper, *Progress of Photography—A Critical Inquiry.* A discussion followed.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 20,119.—"Magnesium-light Cartridge for Photographic Purposes, and Process of Producing same." Complete specification. E. Hackh.—*Dated November* 3, 1892.

No. 20,156.—"An Improvement in the Production of Names, Titles, and other Inscriptions on Photographic Prints, Transparencies, and Lantern Slides." A. Gray.—*Dated November* 8, 1892.

No. 20,253.—"An Improved Photographic Dark-slide Recorder." J. E. Thornton and E. Pickard. *Dated November* 10, 1892.

No. 20,254.—"Improved Arc Lamp for Photographic Purposes." H. Bown and W. Harwood. *Dated November* 10, 1892.

No. 20,418.—"Improvements in Photographic Machines." W. J. Baker.—*Dated November* 11, 1892.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

AMIDOL.

To the Editor.

Sir,—From two letters which appear in your last issue, on p. 735, "W. S. P." and "Othello" are in difficulties with the above (to me) valuable developer. I therefore send the following hints, which may be of service to the above as well as other interested readers.

The stock solution should be mixed thus:—The sulphite of soda is dissolved in half the water used, and the amidol is dissolved in the other half. The two solutions are then mixed together, and are ready for immediate use.

I have used the above developer for the last two months or so with complete success, and, except in cases of great under-exposure, have found it quite unnecessary to intensify.

I have used both the stock solution recommended by the vendors, and one mixed according to my own ideas, with equal success on Marion's Ordinary, Ilford Ordinary, Matchless, Paget XXXXX, Fry's sixty times ground-glass plate, and the Upton. I think a very impure sample of sulphite of soda must have been used, or sulphate of soda or some other chemical was supplied by mistake, or impure water may be the cause. Use only pure distilled, or fresh rain water filtered, for mixing either this or any other solution for photographic purposes. The very fact of your stock solution being nearly colourless seems to indicate that you have used some other chemical and not pure sulphite of soda. My stock solution discoloured in about twenty-four hours, and has got deeper and deeper in tint up to a certain point as time went on, more than a month, but seemed to work as well and as clean as ever, although perhaps somewhat slower in action. I develop for from about four to thirty or more minutes, according to the density required and the exposure given. The shorter the latter the longer the former usually takes with this developer, as with every other I know of, although it is much quicker in action than most developers.

Rock the dish well during the development, and pour the developer off for a minute or two, say every two to five minutes or so (during long development), still moving the dish as if the developing solution was in it. This is to prevent possible markings on the negative, caused by more solution sticking to some parts of it than to others. It is surprising how much detail and density makes its appearance by adopting this simple plan.

With about four ounces of solution (the exact strength of which I do not know, but, judging by its action when compared with another solution of a certain known strength, I believe it to contain about eight grains of "amidol" to each ounce of water), I have developed quite two dozen half-plates during the time stated above, most of which had received exposures of one-sixth to one-tenth of a second on some prize dogs at rather close quarters, out of doors, rapid rectilinear lens, twelve inch equivalent focus, *f*-12 to *f*-16 stops, at midday the latter end of October and the first few days in November. The solution is a rather deep ruby colour, and the plates used were of ordinary speed, probably about 30 on Hurter & Driffield's actinograph.

The solution above mentioned is only used in cases of very quick exposures, as mentioned above, on subjects taken in a very bad light, or on plates found to be under-exposed.

I find it a good plan to filter the developer through clean cotton wool placed in a glass funnel kept for this purpose only, after developing every plate or two, as all marks or spots are thus avoided.—I am, yours, &c.,

Fleet, Hants, November 14, 1892. J. T. Hackett.

To the Editor.

Sir,—Amidol or not amidol? that is the question.

It comes to us boomed by men in the first rank of photographers. Side by side in the photographic journals are letters, some crying, "This is the El Dorado of developers;" others saying, "It is 'stuff,' which it is only waste of time and money to mess about with."

Strange as it may seem, I quite believe that the writers of these widely differing reports have written in all fairness and sincerity, and that they do but report their own experiences. My own experiments compel me to regard it as far and away the best-known developer for snap-shot work. I am quite sure that it will give a printable negative from an exposure which no other known developer can do. I make this assertion from careful and sufficient tests.

At the same time, I have used it with the most deplorable results. Here is, I think, the key to the riddle. It suits some makes of plates and is useless for other brands. This explains why some experimentalists praise it and others condemn it.

I have suggested this to Messrs. Fuerst Brothers (the London agents), and recommended them to issue with their "instructions for use," a list of the makers whose plates are suited to this developer.

I do not think it a good all-round developer (this may be because I do not fully know its capabilities). I should not use it for studio or tripod work, but I should use no other for snap-shot work.

This is saying more in its favour than appears on the surface, because, I think, the hand is ousting the tripod, and the enlarging apparatus supplanting gigantic cameras, lenses, and plates, together with the gigantic cost of purchase and working them. If the hand camera be not the only one used, in the open, in a not distant future, I believe it will be the principal one, and the only really necessary one—with quick plates and amidol.—I am, yours, &c., BART. ROUS.

Nov. 15, 1892.

To the EDITOR.

SIR,—You spoke so highly lately of amidol as the most likely to supersede pyro that I concluded to try it, and now I am more conservative than ever.

I found in the first trial that the picture was rather flat when developed with amidol, but thought it was due to my exposure. I have since found that this was not the reason. The developed image is too transparent in the high lights to give sufficient contrasts, which means that the resulting colour of the film in the negative is not intense enough. Yet I thought I might be able to overcome this trouble with a little experience, the ready-made and long-keeping, non-staining solution always ready for use being unmistakably a great convenience.

Bad weather made me stop my trials for about two weeks, when I received your No. 1697 of THE BRITISH JOURNAL OF PHOTOGRAPHY, and read therein "W. S. P's" and "Othello's" troubles. I at once made a new trial with my two weeks' old solution. Made a positive by contact and developed with old amidol, and got no trace of an image; washed the plate thoroughly and developed same with pyro, and got a fine positive. No more amidol for me, so far, at least, until it gives all what it has promised.—I am, yours, &c., A. LEVY.

4, *Avenue Pinel, Asnières (Seine), November* 11, 1892.

P.S.—Referring to Mr. J. K. Tulloch, M.B.'s paper in same number, you can see what amateurs have come to by reading all the laudatory notes published about them. Their head is continuously swelling, and if there is no stop the doctors will have to be called. In this letter you will find that *it is a well-known fact that every invention and discovery in photography has been from the unselfish and enthusiastic amateur.* This little sentence is unfortunately followed by: *It is easy for the amateur to hurry his little inventions off to the journals; it will take no bite out of his mouth.*

Now, there is one small item which has never been well cleared up. Who is it that fills up your column of "Recent Patents," amateurs or professionals? Which? If amateurs, their hurrying to the journals is sometimes checked midways by the Patent Office. If the much-despised professional, then *every invention, &c.* (see above), *is not* from amateurs only. Let us have some fairness, please.

MR. BHEDWAR'S PICTURES.

To the EDITOR.

SIR,—In a contemporary, of whose existence you are perhaps unaware, I, as Mr. Bhedwar's exhibition agent, explained a few weeks ago why his interesting "Naver" pictures did not appear at Pall Mall; but, since you express some anxiety to know how it happened, I will explain again. Mr. Bhedwar, a month or two back, resigned his membership of the Photographic Society of Great Britain, although, being a foreign member, he had nothing to pay for the privilege. He also, when forwarding his pictures, instructed me not to send them to Pall Mall. From these facts, Mr. Bhedwar being an inveterate exhibitor, the only possible conclusion appears that he, in common with some other artist photographers, lacks confidence in the management of the Photographic Society of Great Britain's show. It is possible you may have noted that a feeling of reluctance to submit their works to the judgment of "scientific experts" has grown among those latter day photographers who are striving to gain higher recognition for the "black art" as a means of artistic expression. —I am, yours, &c., RALPH W. ROBINSON.

Redhill, November 14, 1892.

[It is not a little singular that although, according to Mr. R. W. Robinson, Mr. Bhedwar, when forwarding his pictures (we suppose early in September), gave instructions that they were not to be sent to Pall Mall, our correspondent, the author of the article "An Indian Studio," in an interview with Mr. Bhedwar early in October, should have gathered the information which led him to believe that the pictures were at the Exhibition. As Mr. Ralph Robinson appears, from his amusing statement that Mr. Bhedwar, at a distance of many thousands of miles, lacks confidence in the management of the Society, to be the keeper of that gentleman's conscience, perhaps he will make a still further contribution to this discussion by giving us a theory accounting for the fact that our Indian correspondent's information conflicts with Mr. Robinson's. The concluding sneer as to the "judgment of scientific experts" reminds us of the story of the animal that bit the hand which had succoured it in pain.—ED.]

PROFESSIONAL PHOTOGRAPHY.

To the EDITOR.

SIR,—There are times in the eventful life of a professional photographer when his tranquil soul is stirred to the deepest depths. It may be that it is caused by the advent of a baby entering his sanctuary, or a Scotch collie panting for breath, or similar such emotional occurrences; but the photographer of to-day could certainly not remain callous if he had witnessed the group of about thirty earnest and, as the chairman justly remarked, representative men meeting in solemn conclave to discuss the present status of the photographic profession. Never before in the annals of photography was it more necessary that this should be done, or the need for strong union, more apparent than at the present time. What wonder can it be, then, that one feels interested in, nay, sanguine about, the eventual success of the body meeting on Lord Mayor's Day at Anderton's Hotel? But, also, where were those who should form additional and important links in the chain of strength about to be formed then? Only five London members were present. It was evident, however, that the others had not remained away from apathy. Photographers, owing to the quick, if not easy, production their art is capable of, wanted, perhaps, to see some tangible result of the new Society's doings. Oh, that they could have been present, and have seen the herculean task that the little band of determined men had before them! If they could but perceive that, by their absence, they delay the dawn of a brighter future for the profession generally, they would come in numbers to counsel and help. Now, sir, I firmly believe that it was principally owing to the difficulty of conveying in writing an adequate idea of the useful work the Association is doing that more were not present. I am also aware, Mr. Editor, that I can fully rely on the intense interest you have always manifested in the profession; therefore I beg to be allowed to offer a few remarks on the subject, which I make in the hope that it may induce an increased membership for the Association. I will, in virtue of a resolution passed at that meeting, do myself the honour of calling upon such of the principal members of the profession as the limited time at my disposal will permit.

It must necessarily be premature to expect the immediate carrying out of all those schemes which are known to be needed, however they are constantly held in view, but I can assure you there exists the nucleus of a society which only requires a sufficient number of additional members to make it similarly powerful with the Pharmaceutical Society, Mr. Martin, a member of which, being present, treated the National Union of, &c., to an explanation of their methods in an able speech. He described their gigantic success as being due to brotherly co-operation and casting aside those differences which are the result of great competition. Well, we must join hand in hand. Such names as grace the Council—some of the best professional men—are a sure guarantee that nothing will be left undone to uphold the dignity of a profession which is none the less elevated for being surrounded in their own rank by elements which threaten its very existence.

Can anything be more inspiring than the thought of belonging to a union—the National Union of Professional Photographers—the membership of which alone will be a guarantee of respectability and standing, for it is essentially constituted by some of the foremost men of the profession to combat all that is derogatory to the well-being of the craft?

Will your professional readers who are concerned hold aloof any longer?

Will they not avail themselves of the splendid chance of proclaiming to a suspicious world that they do not stoop to underselling their neighbour, that they do not sell bromide prints for platinotype, &c.?

It may be said that in spite of the initial difficulty of the undertaking, in spite of some discouraging facts, it stands there as the early evolution of a rock, to which, some day, the profession of the future will have to cling for its existence perhaps. Already the signs are not wanting that its diplomas, when it feels strong enough to issue them will be prized by friends and feared by enemies. I imagine the unjustly treated plaintiff or defendant in a photographic law suit, aided in word and deed by their own legal representative. I see the employer and apprentice protected, and witness in spirit the triumph of the system of apprenticeship over the technical schools which, however, may become valuable in their co-operation. In fine the profession will be purified, although the cheap article will always be in demand, and the supply forthcoming. The art production will be valued. Honest labour is worthy of its pay, but skill requires additional reward, which should never depend upon the caprices of the money market. Having come thus far with my remarks, your valuable JOURNAL arrived, and in glancing over it I alighted upon an article by Mr. Tulloch, M.A., which, bearing on the same question certainly requires an answer, for which reason I pray you, Mr. Editor, to to bear with me a little longer.

The introductory affirmation by this gentleman, that he counts many professional friends, I doubt not, but the tone of the letter gives another illustration of the truth of the remark, "Save me from my friends!" I must say candidly, that I do not quite admire the style of Mr. Tulloch's article, and think that his arguments are decidedly weak in many parts. Without going deeply into the matter I will traverse a few; that there are grievances to be remedied is simply proved by the existence of the National Union of Professional Photographers, that that body, the mouthpiece of the profession so to speak, has no animosity against any *bonâ fide* amateur, was evident to all who had the privilege of listening to the excellent address by the Chairman, Mr. Fall, of Baker-street; moreover, I am convinced that most professional photographers worthy of the name would hold out a helping hand to any considerate amateur. The abolition of the strained relations alluded to by him is the aim of the

society before mentioned. Their cause, however, is narrowed to the limits of the questionable amateur on the one hand, and the unscrupulous professional on the other. Let me mention one irrefutable fact, showing that professional photography, contrary to Mr. Tulloch's opinion, must be somewhat on the decline. The facilities of the pastime of photography are responsible for attracting one or another member of most respectable pretty well or even moderately well to do families. These, generally the most lively and energetic specimens of humanity (excepting perhaps the Salvation Army), practise on their own relatives, and on those remaining families with whom they are acquainted, and who have not the good fortune to count an amateur amongst their number, to such an extent, that they generally manage to get at least one good negative. This naturally cools the ardour of being photographed; they are often satisfied with their productions, and thus the professional either loses them altogether or sees very little of them.

An all-wise Providence has certainly left us a good many of the aged and infirm, the tiny little squaller beyond the amateur's reach or patience, &c.; but a goodly portion of the out-of-door trade is appropriated by the amateur, and I know many photographers besides myself (in fact, I do not think I am far wrong in asserting most professionals) who have often met with the threat held out by some secretary or delegate of a club, that if the professional did not consent to a lower rate, one of their number would do the work—in fact, had offered it. Need I go further?

It is amusing to find it continually recurring by speakers and writers (Mr. Tulloch in present instance) that they seem to feast on the fact that all inventions or improvements in photography were effected by the amateur.

Granting for the sake of argument that this is the case, it must be obvious that it is rather childish to try to profit by that, considering the extremely small number of those who have patience, perseverance, and brain power enough to invent anything. But we know it has been shown again and again that professionals have a fair share in the work. As far as practical knowledge is concerned, it lies in the nature of things that the bulk of first-class professional photographers are bound to have a better knowledge of photography than the amateur. At our societies, especially the young ones, professional photographers are often principal spokesmen; and are not the rest of those who ever say much that is valuable, with few exceptions, essentially professionals of a kindred nature, such as doctors, chemists, opticians, professors, &c.?

Mr. Tulloch makes another observation which is especially weak in argument.

"Does he (the professional) not sometimes encroach on the picture framer?" etc. "And it is just this class of men who cry out against the amateur."

Great Scott! (excuse the expression Mr. Editor, I think I have borrowed it from a distinguished amateur, Mr. Pringle). What professional photographer will make his own frames? If he does so, he is more likely to employ a professional frame maker as assistant.

Surely Mr. Tulloch does not, it appears to me, know much about the professional end. I really cannot refrain from making use of his own weapon, and say, "And it is just this class of man who talks nonsense about the profession. Mr. Tulloch evidently means well, but he should be more careful in making statements on matters with which he appears to be only partially informed.

I feel sure that all first-class photographers indignantly repudiate the idea that there is the slightest *animus* against the *bonâ fide* amateur, unless it be caused by those who feel that they are so far above the poor professional in the social scale, that they look upon him in the light of a professional boxer, tinker, or such like.—I am, yours etc., J. HUSBAT.

November 14, 1892.

PHOTOGRAPHIC CLUB.—November 23, *Flashlight Photography*. 30, Monthly Lantern Meeting.

WEST LONDON PHOTOGRAPHIC SOCIETY.—November 22, *A Discourse on Art*, &c., by Mr. J. C. Dollman.

PUTNEY PHOTOGRAPHIC SOCIETY.—November 21, *Bromide Enlargements*, by the Eastman Company. December 5, *Work with a Hand Camera*, by Mr. A. R. Dresser.

ALDENHAM INSTITUTE CAMERA CLUB.—Next meeting, Tuesday, November 22. Subject: continuation of lecture by Mr. Allan Hair on *The Human Eye as a Camera Obscura*.

WE are extremely happy to learn that Mr. Hollyer's benefit day, on Saturday last, realised the handsome sum of 12*l.* 12*s.* 6*d.* for the funds of the Photographers' Benevolent Association.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Technical meeting, Tuesday, November 22, to be held at 50, Great Russell-street, at 8 p.m. Subject—*The Preparation of Photographs for Exhibition*, and *A Demonstration of Flashlight Portraiture on Dry Ferrotype Plates*.

FIRE AT THE STEREOSCOPIC CO'S.—A fire, which is officially ascribed to the overheating of an electric wire, occurred early on Wednesday morning at 106 and 108, Regent-street, upon the premises of the London Stereoscopic and Photographic Company. The shop window was in flames when the firemen from Great Marlborough-street were called up, and a hydrant had to be set to work to subdue the outbreak. The firemen prevented the destruction of the shop, but that and the house of thirteen rooms and the contents were seriously damaged.

THE Annual Dinner of the Photographic Club was held on Wednesday evening last, under the presidency of Mr. William Bedford. The toast of the Club was acknowledged by Mr. F. A. Bridge; other toasts being "Kindred Societies;" "The Chairman;" and "The Photographic Press," acknowledged by Mr. Thomas Bedding (THE BRITISH JOURNAL OF PHOTOGRAPHY) and Mr. H. Snowden Ward; and the "Visitors" (spoken to by Mr. H. Smart and Mr. W. J. Belton). A pleasant evening was passed, although the attendance was somewhat smaller than usual on account of the unfavourable weather.

THE Exhibition in Pall Mall, which closed last week, may be considered as the most successful the Society has ever held. The number of visitors to the Gallery, from September 24 to Thursday Nov. 10, reached a total of 10,361, the lantern evenings especially showing a very decided increase. On Nov. 9, the last lantern display, brought over 300 visitors together, and the slides shown by Captain Abney, Mr. F. P. Cembrano, jun., and Mr. B. G. Wilkinson, jun., were much appreciated. Amongst others, the President exhibited a slide of a flying bullet, by Professor Mach, the different features of which he pointed out. One by Mr. Cembrano, showing a very extraordinary combination, brought about by the same plate having accidentally received two exposures, and Mr. Wilkinson's *Sunset Calm*, were received with great applause.

THE South London Photographic Society will hold their annual exhibition and competition on the 24–26 November, at the Peckham Public Hall, Peckham, S.E. There are eight classes, six members' and two open to members of South Metropolitan photographic societies. Silver and bronze medals are offered in each of the latter. Messrs. F. P. Cembrano, jun., A. Pringle, and A. H. Hinton have consented to act as judges. A large number of entries are expected. The latest novelties and appliances in photographic apparatus will be exhibited by Messrs. Adams, Burr, Hy. Crouch, Ltd., Dolland, Powell & Sons, Percy Lund & Co., Moody & Cattams, Noakes, Photographic Artists' Supply Stores, Powell, Rice, Slater, Wormald, and others. Demonstrations will be given at intervals of the working of photographic processes by the Platinotype Company and others. Lantern displays and instrumental music each evening. On Saturday, at eight p.m., a concert by talented artistes will be given, followed by Mr. H. G. Banks's popular lantern entertainment, *A Tour in the Channel Islands*, and a series of dioramic effects by the triple lantern by Mr. Leonard Greaves. Particulars of space for exhibits can be had on application to the Hon. Secretary, Chas. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.

HACKNEY PHOTOGRAPHIC SOCIETY'S AWARD LIST.—Members' Work: Class A, for any picture taken *since* last exhibition, except animals, portraiture, and *genre*.—Mr. Houghton's prize, Mr. Carpenter, Nos. 1 and 2; Mr. Potter's prize, Mr. W. L. Barker, No. 65; silver medal, Mr. Samuel J. Beckett, No. 16; bronze medal, no award. Class B, for any picture taken since membership, but *prior* to last exhibition, except animals, portraiture, and *genre*.—Silver medal, Mr. S. H. Barton, No. 97; bronze medal, Mr. W. Wesson, No. 106. Class C, for any picture taken at a club outing *since* the last exhibition.—Silver medal, Mr. Hensler, No. 113; bronze medal, Mr. J. O. Grant, No. 136. Class D, for portraiture and *genre*.—Silver medal, Mr. G. Hankins, No. 193; bronze medal, Mr. Samuel J. Beckett, No 13. Class E, for set of four lantern slides taken *since* last exhibition (still life excluded). Given by Proprietors of *Hand Camera and Lantern Review*.—Silver medal, Mr. W. P. Dando, No. 205; bronze medal, Mr. Samuel J. Beckett, No. 203. Class F, for set of six hand-camera pictures. Given by Proprietors of *Photography*.—Silver medal, Mr. W. P. Dando, No. 220; bronze medal, Mr. G. Hankins, No. 230. Class G, for best picture of animal life. Given by Proprietors of *Photography*.—Silver medal, Mr. J. O. Grant, No. 238; bronze medal, Mr. S. H. Barton, No. 239. Class H, for set of six stereoscopic slides taken *since* last exhibition.—Silver medal, Mr. T. Horne Redwood, No. 217; bronze medal, Mr. W. L. Barker, No. 249. Open Classes. Class I, for set of six lantern slides.—Silver medal, Mr. J. E. Austin, No. 256; bronze medal, Mr. A. Brooker, No. 262; also an extra bronze medal to Mr. Carpenter, for No. 250. Class J, for set of six stereoscopic slides. The silver medal given by Mr. Houghton withheld; bronze medal, Mr. J. H. Spencer, No. 265. Class K, for any picture except portraiture and *genre*.—Three silver medals of equal value, Mr. F. S. Scott, No. 276; Mr. C. B. Lewis, No. 335; Mr. J. E. Austin, No. 291. Class L, for portraiture and *genre*.—Silver medal withheld, and three bronze medals awarded, Mr. Lyddell Sawyer, No. 314; Mr. S. N. Bhedwar, No. 361; Mr. R. Terras, No. 311.

Answers to Correspondents.

PLATT AND WHITE.—Price list received.

ALEX. DONALD.—Thanks for the information.

BEGINNER.—The markings on the prints are due to imperfect fixation.

PAINTER.—We must decline to offer an opinion unless we heard both sides.

A. HEILMAN.—You can procure the albo-carbon attachment by ordering it from a lamp-dealer.

E. D. (York).—We imagine that you would get the articles better made in Leeds than anywhere else.

INQUIRER.—We are sending your letter to the firm in question, and shall learn what they think of the matter.

CHARLES HOARE.—The specimens (which have been returned to you) are excellent in posing, lighting, and retouching.

OPTICAL (Paignton).—Of the two lantern screens, one being opaque and the other transparent, the former will give a much more brilliant image than the other.

W. R. HUTCHINSON.—Some articles on the subject of lens-grinding have been recently published in the *English Mechanic*. These, we imagine, will give the information required.

FLORENCE says: "Will you give me some idea how photographic magic-lantern slides are coloured, or what book I can get on the subject?"—See an article on the subject by Mr. E. Dunmore at p. 10 of the LANTERN SUPPLEMENT for November.

H. G. M. CONYBEARE.—1. One combination of the lantern objective (the front one reversed) may be used with a fair measure of success to get a long focus. 2. The ten-feet disc with the single combination will not be so well illuminated as when the complete combination is employed.

T. C. W.—It is rather a sweeping assertion to make, "that all bromide enlargements fade." Those you have were evidently carelessly produced, or they would not have become yellow in three months. There is no question as to the stability of carbon pictures under ordinary conditions.

J. T. ROBINSON says: "If I were to adopt the name of planotype to all photographs, do you think it would be considered an infringement upon platinotype?"—Whether it would be an infringement or not, we should think it would be better not to employ a title likely to be misleading.

F. S. GREEN asks: "Can you tell me where to find information on the methods of testing the sensitiveness of dry plates; the methods of Hurter & Driffield and others?"—Messrs. Hurter & Driffield's method is published in a pamphlet which may be obtained of the Society of Chemical Industry, London.

D. SULIVAN.—If the photographer named has only obtained a photograph of Her Majesty, as she was driving through the country, with a hand camera, he is certainly not entitled to style himself photographer to the Queen and put up the royal arms on his shop-front. Not only is he not entitled to do this, but he renders himself liable to a heavy penalty for his act.

ARCHD. STEVENSON.—The two halves of the condensers described, each four inches and five inches respectively, will make a combination quite suited for your purpose. Let the mount be so constructed as to enable you by one or two trials to determine the best distance for the separation of the lenses, adhering to the general system shown in your drawing, which is substantially correct.

A. W. S.—The only way to deal with the damaged negative is to make a transparency from it, and then touch out the damage as well as you can; then, from that, make a fresh negative, and repair carefully what could not be made good in the transparency. By this means, in skilful hands, a negative can be reproduced that will yield prints which will require little or no touching up.

JOHN WORSNOP says: "Would you give me the addresses of one or two of the best Continental collotype printing firms? Also state if this class of work can be done as well and as cheaply in England."—Messrs. Waterlow, Messrs. Morgan & Kidd, The London Stereoscopic Company, all undertake collotype work, and execute it quite as well and probably as cheaply as Continental firms.

S. TOPPING says: "There are so many formulæ' published for collotype, will you please tell me which is best?"—All the formulæ, though often materially different, that have appeared in our columns, are good. In collotype more depends upon conditions than mere formulæ. It is better to adapt conditions to formulæ than formulæ to conditions; or, better still, adapt the one to the other. This is what practical workers do.

JOHN GASCOINE.—"Will you kindly tell me how to make ink for drawing over a photograph, and also the preparation to dip it into to take away the appearance of a photograph and leave the ink drawing?"—Take an untoned silver print, made the drawing upon it, and then immerse the picture in a solution of bichloride of mercury until the image disappears. The ink must be one that is unaffected by water. Brunswick black thinned with turpentine or "litho chalk" will answer.

A. Z. writes: "A traveller called on me some time back soliciting orders for prints, which he said he would supply on sale or return. I ordered some on these terms, at his earnest solicitation. They came, and were invoiced to me. Now the people have sent an account for the whole of the prints, and demand payment, although I have not sold half a dozen. How should I act?"—If the prints were supplied on the terms named, return those unsold, with the money for those disposed of.

TURNSTILE writes: "I had to copy a bas-relief, and my customer has rejected the picture I have made, saying that it is not good, as it does not fairly show the amount of relief there is in the original. The picture is perfectly sharp all over, and shows all the marks—even of the chisel. What more can I do?"—Mere sharpness is not all that is necessary in such a case; there must be sufficient chiaroscuro to give a correct representation of the original. Try the effect of lighting the work with a strong side-light, and give such an exposure as will avoid black shadows.

STUDIO.—The sketch shows a very good studio, but it is one better suited for single figures than for the general run of professional work, which often includes large groups. We should prefer ourselves a studio with the ordinary side or top light. For the proportions proposed to be adopted twelve feet of glass, side and top, will be ample. Five feet at the top (background end) should be opaque; but it will be convenient to have the side glazed to about three feet at that end for certain effects when required. About forty-five degrees is a good angle for the roof.

INJURED writes: "Some little time back I took the portrait of a very popular local clergyman. The newspaper published in the town, since his death, has given as an illustration his portrait roughly sketched from my picture, which I made copyright when it was first taken. The paper says the cut was made from my picture, but they did not ask my permission to use it. Can I proceed against them for damages?"—Yes; certainly you can proceed, but we doubt very much, under the circumstances, if you will recover anything beyond mere nominal damages, inasmuch as, we imagine, you will have a difficulty in proving that you have sustained any. We should think the picture appearing with your name appended was a good advertisement for you, and increased the sale of your photograph rather than otherwise.

ARTHUR BLAKEMORE writes: "Would you kindly tell me how to mix the distemper for painting backgrounds, and what colours to use? Also, can you refer me to any firm where collodio-chloride paper is obtainable?"—Distemper is made by mixing dry colours with water, and then adding sufficient melted "double size" to cause the mixture to form a thin tremulous jelly when cold. In this state it is to be applied. Any colour can be used, according to taste. Whiting and lamp black will do very well for a grey background. A little Venetian red may be added to give a warm tone. Collodio-chloride paper may be obtained through most dealers in photographic materials.

C. R. A. writes as follows: "Will you kindly answer the following questions? Can any one copy a view in England that is copyrighted and manufactured only in the United States? To protect, must the subject be registered here on the same date that it is copyrighted in America? Can we register views here which are manufactured in America, but which are not copyrighted there? According to American copyright law, negatives must be copyrighted before one print is offered for sale to the public. Is the law the same in England? If not, can an American manufacturers have subjects which are not copyrighted or protected in his own country registered by himself or his agent in this country, and so receive protection in Great Britain? To explain, copies of an American artist's views are now being manufactured in America. This cannot be stopped according to American law, as they have been sold for some time without being copyrighted. Now, if these copied views are shipped into this country, can the original photographer's agent, by getting original subjects registered here, stop the sale of these copies? Another question. We notice the publication of the registration of certain photographs in THE BRITISH JOURNAL OF PHOTOGRAPHY. Does your JOURNAL publish each week every photograph of any description which has been registered during the previous week? Can you also give us the address of the firm who had control of the photographic privilege in the Paris Exposition?"—We are not sufficiently versed in the International Copyright law as regards America, which differs from that of other countries, to give an authoritative opinion. We should advise that a solicitor, who makes a speciality of copyright law, be consulted. The list of pictures made copyright which appear in our columns are only those our publishers have registered for our correspondents. We cannot supply the information with regard to the Paris Exhibition. Perhaps some of our readers may be sufficiently conversant with Anglo-American copyright to reply to our correspondent.

REPLY TO F♯.

A THING of beauty *is* a joy for ever—
So Keats has said, and so we all agree—
But I should think, F♯, that I could never
Decide what's beautiful for you, or you for me.

Nature looks not the same to every creature,
And those new pictures truthfully convey
In each soft line and gentle, hazy feature,
The dreamy stillness of a summer's day.

We might compare the rival styles to music—
'Tis very much the same, it seems to me;
The *major* long has reigned—then let us welcome
Those charming studies in the *minor* key.

Pray, look again! They are not shapeless masses;
Your condemnation's scarcely just, though smart:
Your hand—come, ere the fitting moment passes—
Three cheers for our good President—and Art.

B♯.

FORTHCOMING EXHIBITIONS.

November 18–19.....		Brixton and Clapham Camera Club. Hon. Secretary, F. W. Levett, 74, Geneva-road, Brixton, S.W.
,,	18–26.....	*Stanley Show (Photographic Section). Hon. Secretary, Herbert Smith, 29, Finsbury-pavement.
,,	23–25.....	*Tunbridge Wells Amateur Photographic Association. Hon. Secretary, Joseph Chamberlain, 14, Calverly Park-gardens, Tunbridge Wells.
,,	24–26.....	*Exeter Amateur Photographic Society. Hon. Secretary, J. Sparshatt, Fairfield House, Alphington-road, Exeter.
,,	24–26.....	*South London Photographic Society. Hon. Secretary, C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.
,, 1893.	28	North Middlesex Photographic Society.
February 18.....		Holborn Camera Club. Hon. Secretary, F. J. Cobb, 100 High Holborn, E.C.

* Signifies that there are open classes.

CONTENTS.

THE BRITISH

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THE PHOTOGRAPHIC BLUNDER AT THE WORLD'S FAIR.

Probably those who framed the regulation regarding the admission of cameras to the Chicago Exhibition and the exclusion of stereoscopic cameras had some good reason for the latter element in their decision, but they could scarcely have realised that the obtaining of pictures of the excluded class is not by any means confined to operating with a properly constituted stereoscopic or binocular camera.

When it is considered that a photograph of this kind is nothing else than a duplication of any subject, each taken from a point of view a few inches to the side of the other, it will be apparent with what facility this may be done with a single camera, by taking first one view and then another, previously shifting the camera a little to one side before exposing for the second picture. This, we may observe, was the method adopted for obtaining many of the early stereoscopic scenes of still life. Nay, as we have many times proved, the same end may be secured by the mere rotation of the camera on the stand between the exposures, the only condition for obtaining the necessary dissimilarity being to have the nut in which the screw of the camera stand engages as near as possible to the rear of the camera. A very slight degree of rotation suffices to displace the position of the lens when this system is adopted. True, the amount of the subject on the plate will differ, owing to the central object in one being a little to one side in the other, but this is made right in the trimming of the prints.

Although moving figures or active life cannot be taken by any of the methods just described, yet can this be obtained by two persons having hand cameras and acting in concert. The conditions for taking instantaneous stereoscopic pictures are by no means difficult of attainment. First of all, their cameras must be similar as regards focus of lens, aperture in stop, and rapidity of shutter. They must stand very closely together, side by side. If one possesses the ability to hold his camera under his left arm, while the other holds *his* under his right, an approximation of the instruments will be secured sufficient to give excellent stereoscopic relief in a binocular picture composed of the two photographs thus obtained. A precaution must be taken to avoid having any figures or objects too close to the cameras in this case, else may the relief be exaggerated. It is also necessary that some definite object be fixed upon to be in the centre of the finder, and that both exposures be made simultaneously. For this latter purpose the old-fashioned "once—twice—thrice" will suffice.

We are quite unaware of the reasons by which the directors of the World's Fair have been actuated in making what seems to us at present an unwise inhibition of the practice of photography in a direction altogether contrary to the spirit of the age. But, seeing that they have done so, and that the restraint is, as we understand it, confined to *stereoscopic* cameras, while single or monocular cameras do not fall under the ban, we cannot perceive that violence is done to any principle of ethics by those artists who, while adhering literally and strictly to the conditions of entry imposed upon photographers and pay the sum *per diem* which they are charged, may prefer to use their instruments as they choose, or in some such way as we have here indicated.

Had it been hand cameras that were debarred admission, one might, in view of the displeasing, if not aggressive and offensive, uses to which they are frequently put, readily be inclined to acquiesce, nay, give cordial assent to the interdiction; but upon what principle binocular cameras have been singled out for exclusion we quite fail to understand.

BACKGROUNDS.

A communication recently received from a professional photographer as to a method of storing backgrounds seems to us of so practical a nature as to be worthy of especial note. *En passant* it may be said that, for the last decade or longer, the art of painting backgrounds for photographic use has been brought to a high state of perfection, and there is nothing invidious in stating that it is to Seavey, of New York, that what is in effect a revolution is due. Every one remembers the mechanical style of painting for this purpose that was contemporaneous with the introduction of the *carte-de-visite*. The artistic instincts of many good men so rebelled against it that a reaction set in, and in many studios this particular accessory was conspicuous by its absence. Then the new and really artistic style was introduced, and copied in detail, and finally a new class of painters took up the work, till it became possible to procure every variety of subject with every style of lighting, executed in a manner that would, in most cases, commend itself to the most captious of critics. When, however, a photographer became possessed of a number of these paintings, the question of how to utilise them in the readiest manner became a pressing consideration. One or two could be hung in the usual fashion of theatrical drop-scenes, but with a dozen or so some method had to be devised to enable any particular one to be brought into use with the least loss of time and expenditure of labour. To have a row of them one in front of the other was quickly seen to be open to the objection of producing shadows on the upper portions, a matter, perhaps, of little moment with interiors, but productive of very grotesque effects when an outdoor scene was required. A line of shadow on the

clouds, for instance, was utterly unpermissible with the least exacting photographer. To avoid this, two separate modes of arrangement were adopted.

In one a special background frame was invented, which allowed any special scene required to be brought to the upper portion of the framework and run into position, free from shadow from top to bottom.

The other method consisted in stretching the painting upon a suitably strengthened framework, and keeping a store of these framed backgrounds in the most convenient manner possible. The fortunate possessors of studios of large dimensions had no trouble in the matter, as a considerable number could be placed up and down the studio without being in the way. An excellent manner of working these mounted pictures consisted in stretching them one on each side of the framework, and then supporting them on projecting feet, with struts to give them rigidity, and rolling castors fastened below the feet to render them easily shifted as occasion required. It is with regard to this particular arrangement that the correspondent we refer to sends us information. He has a number of such frames, made in sets of gradually increasing widths between the feet, so that they fit within one another like nests of boxes. But even then, taking the projection of each foot to be, say, eighteen inches, it is evident that half a dozen such frameworks must occupy a space nine or ten feet from back to front, and so by that extent must the available length of the studio be reduced. In some studios, of course, this reduction of space would be a matter of indifference; but it may be safely asserted that the majority of studios would be seriously inconvenienced by being thus shorn of their longitudinal dimensions. The suggested method, then, is for the benefit of those who have adopted this plan of movable screens, and find a growing inconvenience from their multiplication.

The improved way of working is twofold. First, frameworks of rather lighter build are used for additional background pictures, and these are suspended by suitable supports from the upper part of the original frame. Each of such frames may then be made to bear a stretcher or frame, with its two paintings on each face, and thus one set of castors would carry six paintings in three pairs. Any one of them could immediately be utilised either by this temporary removal of the loose frame, which would thus uncover the picture it hid, or be set up on either of its two sides selected, and then rehung.

The other method is to alter the arrangement of the supporting feet. One face of the framework is to be made free of projection from top to bottom, and the castors removed so as just to project, and only so, beyond the level of the face. The stability of the whole would then be considerably lessened. There would be danger of the whole falling over at some untoward moment by the slightest disturbance of its equilibrium. This is to be remedied, first, by so packing the last-named castors as to give the whole frame a permanent tilt in the direction of the feet which are not removed, and the tendency to equipoise is to be still further augmented by the attachment of a weight to the foremost portion of the feet, which would thus act as a lever to arrest any tendency of the framework to topple over. The plan commends itself by its simplicity and evident practicability. If our description be understood, it will be seen that the possessor of half a dozen such frameworks, instead of reducing the length of his room by the three yards or more, can, if they are of "nested" shapes, store them close against one another, and readily store that number in a space of about half a yard. We had intended to make some reference to the use of the scenes, but must defer that branch of our subject to a future occasion.

AMIDOL.

The published experiences of those who have tried this new developer are of a curiously contradictory nature. Some workers hail it in terms which imply that for negatives it possesses all the elasticity of power of pyro with the added advantages of greater rapidity and cleanliness of action; while, at the same time, for positives on paper or glass some find that it is a worthy rival to ferrous oxalate on the one hand, and the various developers which are used for lantern slides and transparencies on the other. Contrasted with these favourable estimates, however, we find several complaints which go far to dispute its value for negative purposes, although it is true little, if any, objection has so far been taken to it for transparency and paper pictures.

It will be remembered that some months ago we were the first to discuss the properties of the new developer, from an experience derived from several trials of it. Subsequent experiments with it have not materially altered the opinion we then gave, and this notwithstanding the various drawbacks which others have found in using it. Summarising these latter, they appear to be chiefly that the solution used according to the original formula, and in great dilution even down to 1 : 10, has a strong tendency to produce surface fog; that its command over detail is inferior to that of pyro; that it yields density with difficulty; that either in plain solution or with sulphite it quickly loses developing strength, a feature which seems to expand in the ratio as it were of a concurrent discolouration.

In our own experiments which we have recently confirmed, we have found that the invariable employment of a grain of bromide to the ounce of developer has the effect of counteracting the veil in properly exposed plates, and herein we are inclined to think lies one secret of the successful employment of amidol. Bromide, in fact, is indispensable in normal exposures, and should be increased or decreased in accordance with the disposition to over or under-expose. Naturally this slows development, the too rapid action of which we have also clearly proved to our own satisfaction is responsible for the frequent lack of density complained of. The use of bromide both obviates veil, and ensures density with amidol.

As regards detail, we are yet unable to ascertain that it has any superiority to pyro; but, on the other hand, it is not appreciably, inferior. We at present hesitate to definitively assign amidol its true place, inasmuch as it is still very little understood for negative work. For transparencies it works clearly and brightly, and the tones on glass it yields with full exposure, are characterised by an almost wet collodion-like quality. This brings us to another important objection to it, namely, its lack of keeping properties in solution.

As a matter of fact, we have found amidol in solution most puzzling in its keeping qualities. With boiled, distilled, and ordinary tap water, curiously enough, and with the same sample of sulphite, it has, in the course of a few days, exhibited in our hands different degrees of discolouration and developing power. But difficulties on this score need not be tolerated if one takes advantage of its ready solubility and uses it dry, as pyro was wont to be used formerly. All then there would be necessary to provide would be the stock solution of sulphite, in which the amidol might be dissolved as required. This, indeed, is the plan we have ourselves adopted.

From our own experience, we suggest that the key to the effective employment of amidol lies in the invariable presence of bromide with it according to circumstances, and its use in the dry state—that is, dissolved as required. We await further results and experiments with much interest.

The Maddox Fund.—It will be seen, from a communication in our last issue from Mr. Andrew Pringle, that the illuminated testimonial to Dr. Maddox has at length been presented to him, a cheque for about 400*l.* having been handed to him several months ago. This week we publish a communication from Mr. Sharp, the Hon. Secretary to the Foreign Fund, by which it will be seen that over 100*l.* was collected abroad, making a total in round numbers of 500*l.* which was raised for Dr. Maddox, whose letter of thanks we also publish this week. Thus ends an incident agreeable and creditable to all concerned in it.

Perfect Negatives.—The subject of the evening at one of the provincial societies was, recently, "What is a perfect negative?" Now, if there is one thing more than another upon which the opinions of photographers differ—and they differ on many—it is on what constitutes a perfect negative, and from what standard it should be judged. At one time the wet-collodion type of negative used to be quoted as the one to be aimed at in the dry plate. That is not the case now, except for special purposes. When this theme is started amongst practical workers, particularly if one or two theorists are present, a pretty smart discussion can generally be relied upon. Here is a hint for many societies.

Photography and the Nansen Polar Expedition.—We understand that Dr. Nansen, who shortly starts on an expedition towards the North Pole, takes the inevitable Kodak with him, presumably with the object of securing, where practicable, a photographic record of his adventurous journeyings. To that end he is also undergoing practical instruction in development, &c., and, with the confidence that seems one of his main traits, reckons upon success in photography as well as in Polar exploration. Some years ago, if we remember aright, Mr. W. J. A. Grant, of Collumpton, Devon, accompanied a private Polar expedition on board the *Wilhelm Barentz*, and succeeded in obtaining photographs of scenes comparatively near the mysterious Pole. A narrative of photographic experiences in such latitudes would doubtless prove instructive as well as entertaining.

Photographic Meetings.—What a marked change there is in the meetings of photographic societies now and in times gone by. The stiff, formal meeting is now a thing of the past, except, perhaps, in one or two societies. The more social character of meetings was, in the first instance, inaugurated by the old South London Photographic Society, and was largely amplified by the Photographic Club. Experience shows that, the more social and less formal the character of the meetings of all photographic societies, the better is the attendance. The tolerance of the "fragrant weed" also, in many instances, conduces to the same end. Smoking concerts are now made a feature of in many societies. Such a thing would, at one period, have been considered *infra dig.* by most, but now they are looked upon by some as the most popular and enjoyable meetings of the year. It is the introduction of the more "free-and-easy" or less formal nature of the meetings that has tended to secure the good attendance at so many of the new societies.

Photographic Trade Unionism.—Judging from the report of the annual meeting of the National Association of Professional Photographers, that body is not so strong as it would wish to be. That the objects of the Society, if they could be carried out, would benefit the profession generally, there can be little question; therefore it is not a little surprising that it receives such scant support from it, seeing that its management is in capable hands. Is not the Association, as we have suggested before, aiming at accomplishing too much? It would certainly be desirable to regulate prices, but we fear this is not to be done. Members of the Association may agree amongst themselves as to a minimum charge, but they cannot govern those who are not members, and the public will go where it suits them best. In a measure it has succeeded in causing a revision of the tariff, to the public, of some enlargers, but not all, it appears. If the Association received universal support, it might do a great deal to the advantage of the profession in many ways, but while its numbers are so restricted its powers are necessarily very circumscribed. At present it is not strong enough to successfully boycott offending wholesale houses, who work alike for amateurs and professionals on similar terms.

Contraction of Gelatine.—At a recent meeting of the Photographic Society of Philadelphia, one of the members said that the strong contractile power of the gelatine employed for some dry plates was so great that it tore away the surface of the glass at the margins of the plates. This experience, we should say, is somewhat exceptional in the States—it certainly would be here—with regard to dry plates. That gelatine has the power to tear away the surface of glass if it be over-dried, every collotype worker is aware. But here the conditions are different from what they are with dry plates With collotype plates the surface of the glass is often ground so that the gelatine has a rough surface to hold to instead of a smooth one. Then, if the film be over-dried, it, in its contraction, tears up the glass in a very curious manner, usually resembling fern leaves. It is on this principle that the decorative glass, known as "crystalline glass," is produced. Different characters of gelatine seem to give different patterns. It may be possible that the strong holding power of the gelatine spoken of in America may be caused by the plates being prepared with a substratum containing a silicate that would give a certain amount of tooth.

DENSITY IN COLLODION EMULSION.

Since the earliest days of the washed-collodion emulsion process more or less difficulty has existed in securing density in the finished product, and numerous have been the expedients put forward to supply the deficiency. These have mostly consisted in the introduction into the emulsion of some kind of organic matter capable of combining with the silver in sensitising to form a more highly organic compound than occurs with the collodion itself.

Lactic and malic acids, as well as lactates and malates, glycocine, and similar substances were amongst those used. Impregnating the collodion with gelatine before converting it into pyroxyline was another method by which it was sought to introduce more highly organic elements, and indeed the changes were rung so completely that scarcely any form of saccharine or gummy matter, or of the organic acids and their salts, escaped trial. Another plan consisted in allowing the collodion or emulsion to remain for some time under the action of free silver in the presence of a considerable excess of mineral acid, usually nitric, though sulphuric acid was also recommended by the late Colonel Stuart Wortley, the function of the acid being to render the action of the silver more caustic and penetrating. In the case of sulphuric acid perhaps another effect was produced, of which notice will be taken further on.

But unfortunately, although many of these plans answered the purpose intended well enough in the case of an unwashed emulsion—that is to say, one that was used for coating the plates before its soluble salts had been removed—it was too frequently found that, in washing the emulsion in bulk to remove the salts, the organic element also disappeared, leaving in most instances a product which, while it might be extremely sensitive and work free from fog, was incapable of yielding printing density. This, apparently, forms a portion of the complaint of "J. R. G.," alluded to in last week's issue.

Some fifteen years ago I hit upon a formula, which I published at the time, by which, combined with the highest degree of sensitiveness, I was able to attain a far greater density than was obtainable even with much slower emulsions; indeed, the trouble now was to avoid over-density. The formula consisted of an emulsion containing an excess of silver as large as five grains to the ounce, held in check as regards its fog-giving propensities by the addition of a

suitable quantity of citric acid. At first sight it might be supposed that such an emulsion owed its properties to the presence of citrate of silver, though I very much doubt whether, even in the emulsion itself, that salt was formed, while it is pretty certain that none could be present after perfect washing.

It has been often pointed out that, although citrate of silver is usually supposed to be insoluble in water, or very slightly so, such is far from being the case, and that on the contrary it is pretty freely soluble. At any rate, if silver nitrate and an alkaline citrate in equivalent proportions be dissolved and mixed, the precipitate just formed is quickly redissolved, while no precipitate at all occurs on the addition of citric acid to nitrate of silver; but, if the latter salt be dissolved in plain collodion, and citric acid added thereto, a dense white emulsion is formed, owing to the insolubility in alcohol and ether of the compound salt formed, whatever it may be. But, curiously enough, if the emulsion be poured on to glass in the ordinary way, it will set and dry perfectly transparent, except, perhaps, for some signs of crystallisation. All trace of citrate of silver is absent; indeed, if it be formed at all, it is redissolved by the nitric acid displaced from the nitrate, and most probably the compound is a citro-nitrate of silver partly soluble in collodion.

It must be perfectly evident that, though this salt may exist in a state of partial solution in the emulsion, it is bound to be removed entirely when the emulsion or film is washed, and that therefore the extra density obtained cannot be due to any citrate of silver left behind. This indeed, if present, would, by reason of its solubility in water, suffer instant reduction, and cause fog the moment a developer was applied, in precisely the same manner as would be the case if excess of silver nitrate were present.

A somewhat similar result occurs if sulphuric acid is added to the emulsion in the presence of excess of silver, as recommended by Colonel Wortley. Although the addition of sulphuric acid to an aqueous solution of the salt causes no precipitate of sulphate of silver, yet, when added to collodion containing silver nitrate, the precipitate does occur, and it was at first supposed to be an organic compound of sulphate of silver and pyroxyline; but I think it is tolerably certain that it is a purely inorganic salt, thrown down by reason of its low degree of solubility in the vehicle. The nitrate is soluble to a considerable extent in collodion, and forms a clear and colourless solution; but, if more than a certain quantity be present, then an emulsion will be formed in the same way by the precipitation of the excess in extremely minute crystals which remain in suspension.

The result as regards density produced by Colonel Wortley's method is similar in character—though less in degree—to that obtained with citric acid and excess of silver, though, as in that case, there can be no sulphate of silver left in the emulsion or film after washing, since that salt is perfectly soluble in water. How, then, do such additions act in modifying the character of the emulsion?

It has struck me that the action is twofold. In the first place we have the organic reaction set up by the soluble silver salt in excess and a further action, of another kind, of the free acid. The latter, as is well known to collodion workers, exercises a tendency in the direction of rendering the collodion thicker or more viscous, and the resulting films more "horny" and tough, as well as impervious to water. This is more particularly the case with citric acid, a comparatively small quantity of which will render an otherwise fluent collodion too thick to spread over the glass. The toughening action is least noticeable with nitric acid, but is very marked with sulphuric.

Now, it seems to me that it is to this last-mentioned action that we mainly owe the increased density obtained, or rather the *retention* of the density after it has been produced by the organic matter. For it is easy to conceive that by rendering the emulsion tougher and less pervious to water we avoid the serious washing away of the important organic element that goes to cause the want of density under ordinary circumstances. In other words, the emulsion enjoys the advantage of excess of silver, while the acid prevents fog, and also arrests the tendency of the emulsion itself to dissolve in washing. The effect is much less marked when the acid used is nitric for the reason I have already mentioned, that the hardening action of the latter acid is much less than either citric or sulphuric.

With these ideas in view, I was led in the early part of the present year to test the matter in connexion with a number of samples of pyroxyline that were utterly unsuited for washed emulsion under ordinary circumstances, and with perfect success so far as density was concerned—this being the great stumbling-block—although I met some curious variations in sensitiveness with different samples of cotton.

My first experiments were made with the old formula containing excess of silver and citric acid, which, in my own way of working, I have almost always found perfectly successful, though I have been told by others that they have failed to work it. There is, perhaps, a liability in the direction of fogginess if too long a period be allowed between sensitising and washing, but otherwise I have never had any trouble with it.

To obviate this slight difficulty, I substituted for the citric acid a soluble citrate, so as to form in the emulsion an undoubted citrate of silver which changes the conditions rather materially. So long as the emulsion remains unwashed the citrate of silver seems to be practically as inert as the bromide, on account of its insolubility in the vehicle in which it remains suspended, but the instant water touches either the emulsion or the film the citrate is started into activity, with the result that the emulsion gets the benefit of the action of free silver during the period of washing, which, as I pointed out in a previous article, is an important point in securing density.

As a variation from this, I added a small quantity of citric acid as well as the alkaline citrate, in order to secure the beneficial action during washing, and this appeared to still further aid density, though not to a very marked degree, the citrate alone proving amply sufficient. The proportions of the citrate employed varied from two to four grains of silver nitrate converted, and, where the acid was employed, I used one grain to the ounce.

It follows, as a matter of course, upon the solubility of the citrate, that the emulsion must be very thoroughly washed to remove it, otherwise the first contact of the developer will cause fog. This point having been attended to, I think "J. R. G.," and such as have any difficulty in getting density, will find their way out of their troubles in the direction I have suggested. W. B. Bolton.

JOTTINGS.

Mr. George R. Sims, a journalist whose comments on passing events invariably possess the merits of common sense, writes thus in the columns of his paper: "My compliments to the Editor of the *Daily Graphic*, and if he could drop those corpses on the seashore I should be very much obliged. A corpse now and then is all very well, but a cold corpse with your breakfast every morning for a week is exceedingly trying to the digestion under the present atmospheric conditions." I have seen some of the sketches "Dagonet" refers to, and very grim and gruesome they are. They represent the bodies flung up by the sea from the wreck of the *Roumania*, and are reproduced by the artist from photographs. I do not know whether the photographs of the bodies were taken under the direction of the Portuguese authorities; but, if they were, it is an outrage on the living and the dead that they have been allowed to pass into the hands of the editor of the *Daily Graphic*. On the other hand, if the photographs were taken by the ubiquitous amateur, and by him passed in to the editor, the sooner public opinion rises to stamp out this debasement of our art to the level of the doings of Burke and Hare, the better it will be for photography, and for public and private decency.

Mr. Ralph Robinson and his friends' revolt against the judgment of "scientific experts" at photographic exhibitions either means that the men who were capable of adjudicating upon the artistic merits of photographs produced before differentiation of focus became popular, are incompetent to exercise a similar discrimination when the latter method of artistic photographic expression is employed, or that in neither case is that judgment to be accepted as reliable. If the latter, will Mr. Robinson and his friends prove the faith that is in them by throwing away or returning all the medals they have received at the hands of scientific experts? Again, supposing the former meaning is intended, why does Mr. Ralph Robinson send Mr. Bhedwar's pictures to Hackney, where the Judges (in addition to himself) were that un-

questioned "scientific expert," Captain Abney, and Colonel Gale, an artist if you like, but above all the most prominent exponent of the highest technique in photography we have? Of course Mr. Robinson did not adjudicate upon pictures of whose exhibitor he was agent; and I therefore ask him if, in the face of his own pronouncement against "scientific experts," he feels justified, on Mr. Bhedwar's behalf, in accepting the medal?

While the photographers are meeting together to discuss their grievances, and to devise remedies for them, the Editor, in a brief append to the letter of a correspondent, gives a piece of advice which should be of great service to a class which I fear is in need of all the assistance that good counsel can afford—a class, moreover, of such a scattered and heterogeneous nature that combination for defensive and ameliorative purposes is practically impossible. I allude to photographers' assistants. The writer of the letter I refer to recounts an old grievance of his class in drawing attention to the reprehensible practice among some photographers of stealing—that is the only term applicable—the specimens submitted to them by assistants seeking employment for them. The Editor says to the assistants, "Write your names and addresses across the pictures." And I would venture to add, say, "This is the work of" So-and-So, and put a date. Such an inscription might prevent theft, and certainly would take it out of the photographer's power to use the specimens for the purposes of deceiving his clients.

So "Talbot Archer" has recommenced his contributions to your contemporary, *Anthony's Bulletin!* Well, well; some journalistic hides are tolerably thick! It is to the lasting credit of British journalism that the only one American photographic publication which joined me in my crusade against "Talbot Archer" is edited by a north countryman, John Nicol, a former contributor to this Journal, a fact which e'en disposes me to forgive him for having politely styled me an "optical ignoramus" in the correspondence columns of the *Beacon*.

Eight photographic exhibitions in the month of November—six of them being held either in London or adjacent thereto—is really too much of a good thing for press and public, although, no doubt, the pot-hunters are in their element. The chief offenders in the clashing are the London photographic societies, to whom I venture to suggest that, in future, an effort be made to avoid overlapping *or* clashing, neither of which are calculated to benefit their exhibitions either in the estimation of the trade, the general body of exhibitors, or those whose duty it is to attend them. Where those exhibitions rely for financial success upon local support, it cannot in the least matter the precise date at which they are held, hence there need in future be no difficulty in arranging "clear dates," so as to obviate the uncomfortable jumble of the last few weeks. Cosmos.

A NEW PHOTO-INTAGLIO PROCESS.

[Journal of the Franklin Institute.]

With the exception, perhaps, of the domain of electricity, there is no other special field wherein the recent advances of science have opened so many avenues of progress and effected such notable changes as in the range of the graphic arts. From the time when, fifty years ago, the earlier researches of Scheele and Seebeck on light-sensitive compounds were first wrought into practical shape by Niepce, Daguerre, and Talbot, the applications of photo-chemistry have increased in number and extent to such a degree that to-day the various processes of photographic reproduction would require a long catalogue to merely name them. Many of these variations, though marked, are unessential; others have proven of scientific interest only, while quite a long list of practical photo-reproductive processes have from time to time been superseded by simpler and more efficient methods.

The new photographic process which I have the pleasure of announcing to the Institute this evening is, as I trust will appear in practice, an effective and greatly simplified method of producing a photographic reproduction in the form of an intaglio engraving. Such engravings, technically known by the French term "photogravure" have been produced for some years past by a variety of photo-chemical processes, the most notable of which are those wherein the result is attained by means of a chrome-gelatine film. The fact that a film of chrome-gelatine becomes insoluble when exposed to light, and remains more or less soluble according to the degree to which light is permitted to act upon it, has been made the basis of a variety of processes for the production of photo-engravings. The gelatine film long served as the most effective means for the production of photo-engravings in relief, and still furnishes the basis for the production of photo-engravings in intaglio. For both purposes the sensitised gelatine film is exposed under a transparent negative or positive, as may be requisite in the subsequent procedure; the unaffected portions and unreduced quantities of the exposed film are either swelled by absorption of a liquid or are dissolved and washed out, and the film then dried. In this condition it may be printed from direct, or it may be used as a mould to produce a reverse in a fusible metal; or it may be covered with an electrolytic surface to receive an electrotype deposit, or it may be moulded in plaster, wax, gutta percha, or other suitable substance, from which, in turn, a reverse can be made by casting or electrotyping. Intaglio photo-engravings have also been produced by a process wherein the varying amounts of reduced silver left in the developed gelatino-bromide plate are made to serve as a corrosive or etching agency on a plate of copper on which the bromide plate is imposed, but in general practice the washed-out gelatine film has thus far proven the most practical means to the desired end.

In all photo-intaglio processes hitherto known or practised, the nature of the plate produced and the end sought to be attained is akin to that which is technically known as a mezzotint or aquatint engraving. The essential feature of such engravings consists of the varying depths to which the design is sunken in the plate, the graduations of depth in the plate corresponding to the gradations of light and shade in the printed impression. The ink being rubbed into the depressions of the design and rubbed off from the surface of the plate, the highest parts of the engraving represent the highest lights of the design, the deepest depressions render the darkest shadows, and the intermediate depths produce the half-tone gradations of the picture.

The difficulties attending the production of photogravure plates with the particular degree of graduation of depth which is requisite for an artistic effect in the printed impression are such that the process is practised only by a few, the skill and experience needed for the work being attained only after a long practice and then in a full measure only by such individuals as possess artistic capacity and training. In only one establishment, and that in Paris, has the work been brought to a high degree of quality, and there, as well as in other workshops, the hand of the skilful retoucher is frequently to be credited with the largest share in the final result.

To free this result as far as possible from the limitations of human handiwork, and to bring it forth under the more uniform and definite control of scientific procedure, has been my aim in the experiments which have resulted in the present method. This method I have named "photo-mezzotint," not because that is the most exact term by which to denote it, but because all the other good names have already been pre-empted and made to do service in other directions.

The essential feature of the new method lies in the fact that the picture, instead of being obtained from a graduated depth of the engraving, is produced from a sunken surface of uniform depth, the gradations of light, half-tone and shade being effected by minute lines and stipples of varying thicknesses, but of uniform distance apart from centre to centre. In this respect the photo-mezzotint may be regarded as a development of the so-called half-tone relief process, the true mezzotint or photogravure effect being attained by reducing the thickness of lines and stipples, and multiplying their ratio to the surface to such a degree as to render them invisible to the naked eye. In that way all the finest gradations from pure white to deep black are obtainable, with the result shown by the specimens before us. In these the picture is made up of equidistant stipples, varying from a microscopic point up to a size where they coalesce into a solid black, the half-tones consisting of stipples of about one four-hundredth of an inch in diameter, and about 44,000 to the square inch. If a coarser stipple is used, the effect varies from that of a mezzotint and approaches more nearly that of a line engraving, the lights and shades being made up of perceptible lines and stipples, like the effects of a steel or copper plate engraving of equal texture.

The processes at present in vogue for the production of photo-intaglio plates require not only long experience and a high degree of manipulative skill, but also take up quite a length of time—frequently a week or more—for their completion, and the plate, after passing the stages of the photo-chemical process, has then still to be extensively helped by the work of the retoucher. The retouching of photogravure plates inevitably introduces a degree of uncertainty as to the accuracy of the reproduction, the

result as left by the retoucher being frequently very different from the original in its disposition of lights and shades. By this new process all these undesirable factors are eliminated; its manipulations are far more facile, the length of time for the entire work is reduced to a few hours, and the result is complete without the supplementary aid of the skilful engraver, except, possibly, in cases of local blemishes or accidental defects. It is therefore reasonably to be assumed that this new method of intaglio engraving, which has been made the subject of an application for letters patent, may be regarded as a desirable addition to the category of the graphic arts. LOUIS E. LEVY.

DEVELOPMENT.

[Holborn Camera Club.]

THE subject of development is one from which we may all learn something, and cannot learn too much, and it is one which the worker in photography must thoroughly master if he ever hopes to take a prominent place in the photographic world. How many of us here to-night know how to develop a plate properly? It is the stumbling-block over which we all fail; it is the blow that shatters all our hopes. Everything was right up till then; the day was fine, the wind still; the exposures were thought right, notes carefully made; but in the development all our hopes were shattered.

Now, why did we fail in development? The developer was made right, and carefully measured out according to the instructions, and yet it all went wrong. The plate is perhaps full of detail, but "Oh, so hard!" or else it is flat and foggy; that cherished little bit of distance, or those charming reflections in the water are all blocked up, and certainly will not print out. What is the consequence of this? Either the plates or the developer were wrong. But this need not be if we would only (to use a well-known writer's words) mix our developer with a little brains, instead of always going by the instructions on the box, which are, to my idea, greatly misleading in most cases.

Now, I must assume, for the time, that we all know something regarding exposure, as the two things are so closely linked one with the other that it is almost impossible to separate them.

My idea this evening is not to give you a list of the various developers, and formulæ, and the results from each which we have had so often brought before our notice, nor to advance one developer or style of development as right and all others wrong. I may mention here that the developer I use, and shall use to-night, is the plain pyro and ammonia with a little sulphite of soda, but I do not for one moment say that this is the best, or better than a pyro-potash or pyro-soda developer. They are all good developers, and equally good results can, in my mind, be obtained from either.

What I rather want to say is that in development, treated rationally and in a business-like manner, we have at our disposal the means of producing in the negative something like the image we saw on the focussing screen. And if, when we expose our plates, we were only to give some consideration as to how we should develop them, we should not give such fearful exposures, nor work the shutter at such a tremendous speed. The consequence would be that the average of our results would be considerably higher, and our plates would not find their way into the dust-box so often.

THE DEVELOPER.

Now, a few words as to the developer and how to make it up.

The pyro, the real developing power, I use dry. In my mind, it is much more convenient to use, and it is more energetic, than when made up in solution with anything else. *The ammonia* I keep diluted to half strength, although, perhaps, a ten per cent. solution would answer better. *Bromide of ammonium* I have made up in a solution of a grain to a drachm of water, which is very simple, and from which I can get any formula. *Sulphite of soda*, which is useful in keeping the plate clean, I make up in a ten per cent. solution. Altogether, my developer consists of four bottles; but it is far better than having the bromide mixed with the ammonia, the same as is so often recommended.

EXPOSURE AND DEVELOPMENT.

Going on, now, to the exposure of the plate, it must be borne in mind that different workers have different ideas of exposure, according to how they intend to develop. One man advocates an exceedingly short exposure, coupled with a rapid and strong development, while the other worker will very much over-expose, and develop with a developer weak in all parts and well watered. They may both be right, but, myself, I am rather inclined to over-exposure and slow development, as I think by that means the lights and shades are rendered in much better proportion, although, no doubt, slight under-exposure and quick development has its good qualities, especially in rather foggy or misty weather, when it is possible by this means to pierce the fog to a certain extent, and get much more brilliant results than could be got by any other method.

Over-exposure, on the other hand, has its good qualities, especially in weak light, such as you get early in the morning or late in the evening, when, by judicious over-exposing, developing for a thin negative, and then intensifying, very good and clear results can be obtained.

I will now briefly go over the different classes of subjects met with in every-day work, and the best proportion to mix the developer; but I must say that these are only hints, as we can lay down no hard-and-fast rule in developing. Every plate requires its different developer and different method in working.

Portraiture.—For portraits we require soft, delicate negatives full of gradation. For such subjects rapid plates are best, as they give softer images; the developer should be kept weak, and the exposure should be very full. A good developer for portraits is—

Pyro	1 grain.
Ammonium bromide	1 ,,
Ammonia	2 minims.
Water	1 ounce.

The negative should not be too dense, but it should be borne in mind that if the lighting is flat, you must use a stronger developer so as to get contrast.

For general *Landscape* work it is as well to use a well-restrained and weak developer, especially if there is much distance; the foreground can generally be brought up by a little stronger developer worked round the plate later on.

Sea, sky, and Clouds.—In these subjects we generally have but little contrast, so all should be done to create contrast by slightly under-exposing and using a developer strong in pyro and bromide. If these subjects are at all inclined to be flat, the best way is to fix the plates as soon as all the detail is out, and then intensify.

In *Interior Work* and *Architectural Work* there are two methods open: to expose slightly under, and use a developer very weak in everything, and well watered, or to considerably over-expose, and use a developer very strong in pyro, and weak in bromide and alkali. Both methods give very fine results. I can hardly say which I consider the best, but my own work is done by the first method.

In *copying*, which is by most amateurs considered the most difficult branch of photgraphy, the great thing is to gain pluck and vigour. This can be got, to a certain extent, by using a slow plate, a short exposure, and slow development; but in all copying, especially albumen prints, if you are not careful in placing the print to be copied so that any reflections are not seen, you will find it almost impossible to get a good plucky negative. In copying line drawings you require a quick developer, and and one giving good density, as, if you are not careful, the fine lines will clog before you get sufficient density.

In subjects which are known to be very much under-exposed, although first-class negatives can never be got from them, still very fair results can sometimes be got by first soaking the plates in a weak solution of ammonia—say two drops to the ounce—for six or seven minutes, then using a developer strong in pyro and ammonia.

Before concluding, I should point out one thing more in development, and that is to tell if the plates are under or over-exposed when the image first appears.

It is the generally accepted rule that an over-exposed plate shows signs of development very quickly, and under-exposed very slowly, but this rule cannot always be relied on. Take, for instance, a plate which has been very much over-exposed on a dull or foggy subject, and in a dull or weak light, such a plate will sometimes be a considerable time in the developer before there are any signs of an image forming, but when it does come it generally comes all at once. Again, on the other hand, take an interior which has been slightly under-exposed and developed with a weak and well-watered developer. Such a subject will develop very quickly. That has been my experience, so you will see that it is as well to study the first appearance of the image, or else you are very often liable to treat an over-exposed plate for under-exposure, and consequent failure.

In conclusion, I may say that I have given no definite method of development, as practically there is none. Every plate requires its separate development, according to what it is, under what conditions of light and exposure it was taken, and what you require in the resulting negative, but can only hope that members of this Club will give themselves to spending more time in the development of their plates, remembering it is the chief point towards successful photography. JOHN H. AVERY.

THE HELIOCHROMOSCOPE.

[Photographic Society of Philadelphia.]

IT was in 1888 that I first described and demonstrated, at the Franklin Institute, a method of reproducing the natural colours by photography, which differed in certain vitally important particulars from somewhat similar processes which had already been carried out by Cros and Du Hauron in Paris, Albert in Munich, Bierstadt in New York, and others. I succeeded in reproducing the natural colours in landscapes and various objects with a degree of accuracy which I have good reasons to believe had never before been approached by any method without the intervention of the artist's brush. The procedure was, however, too complicated and difficult for profitable commercial application, and comparatively few specimens were made.

I now present to your notice devices which so greatly simplify the operation of the process as to make it quite possible to place it in the hands of even the "press-the-button" class of amateur photographers, and yet yield results that are no more defective in colour-rendering than the ordinary photograph is in the rendering of monochrome light and shade.

The first of these devices is a camera attachment by means of which the three pictures representing the effect upon the three fundamental colour-sensations are made by a single exposure on a single sensitive plate, and from a single point of view. The device as now perfected is surprisingly simple, being comprised in a small box, which may be attached to the front board of an ordinary camera. The division of the light-ray is effected by transparent mirrors, as in some of my earlier cameras, but in such manner as to dispose the images symmetrically on a single plane, without altering the position of the camera in relation to the object.

The second device, which I call a heliochromoscope, contains the same arrangement of mirrors, turned about so as to serve to recombine the three photographs in such manner that the photographic colour-record is translated into colour again as readily as the sound-record in the phonogram is translated into sound in the phonograph.

The most important advantage of this device is that it may be used at any time, at a minute's notice, like the stereoscope; and, as almost everybody may possess one, it is competent to make the realisation of colour-photography a household affair. It also more completely fulfils the theoretical conditions of success than either the production of colour-prints or lantern projections, and produces an illusion of nature more perfect than would be possible with even an absolutely perfect colour-print on paper, because the picture is seen without surface reflections or distracting surroundings.

I claim for this system of colour-photography that it is perfectly rational and scientific, and a true solution of the problem of reproducing the natural colours in a photographic picture. This claim meets with a good deal of opposition in the minds of some people, whose mental attitude is a source of wonder to me, because the same sort of objections that are made to the triple photograph would apply to the stereogram and the phonogram. One is an automatic record of colour, another of binocular vision, and another of sound; each must be placed in a special device in order to reproduce that which it has recorded—the triple photograph or chromogram into the heliochromoscope, the stereogram into the stereoscope, and the phonogram into the phonograph. I do not remember ever to have heard the stereogram denounced because it is not a single print with embossed relief, or the phonogram because it has no lungs.

Some even go so far as to deny that this can properly be termed colour-photography at all, although the same individuals are in the habit of calling pictures that cannot be made to show colours "orthochromatic" or correct-colour photographs. But the most extreme illustration of this peculiar attitude of the mind that I have seen is the assertion of one who, if I am not mistaken, has aspired to be the historian of photography, that this is merely "looking at ordinary photographs through bits of coloured glass!" To be consistent, this writer should describe the stereogram as "two ordinary photographs, mounted on the same card," and the phonogram as a "wax cylinder having a roughened surface like an ordinary file." I believe he did recently write a history of photography, with "an introduction to its latest developments," without once mentioning colour-sensitive plates.

I speak of this kind of criticism because it comes from men whose writings are in demand, and proves the existence of a deep-seated prejudice, which I have encountered in the development of other applications of photography, and which must be combated in order to overcome it. I will give an illustration. When, in 1880, I succeeded in realising a mechanically accurate and practicable method of half-tone block-making, I could find only one engraver who believed there was a future for processes that rendered the shading in equally spaced graduated lines and cross lines. Engravers, printers, publishers, and photographers were agreed that if a block be made up of lines, those lines must follow the contours of the object depicted, as in the conventional wood-engraving. Since that could not be done, a grain, similar to the well-known lithographic grain, must be substituted for the line tint. I declared that the objection to a regularly lined tint was a prejudice, stuck to it, and already, within twelve years, plates having that same lined tint have come into such extensive use as to replace millions of dollars' worth of wood-engravings. They are used in illustrating books and periodicals of the highest class, and the advantages of the mechanical lined tint are such that it threatens even to invade the domain of photogravure. Mr. Louis Levy exhibited such results at the last monthly meeting of the Franklin Institute, and I myself applied for a patent on a printing-plate of this character more than a year ago, having first experimentally demonstrated certain important advantages which they can be made to possess.

We did not make half-tone printing plates of the kind that engravers, and printers, and publishers thought they must have; but they concluded to take what we did make, and are taking them more and more every year.

We have not made photographs in the natural colours of exactly the kind that people have been looking for, and there is good reason to doubt if such a result will ever be accomplished; but we have actually realised, by a process almost as simple as stereoscopic photography, results better than can even be hoped for in colour-prints, and so perfect that they must ever represent the standard which results by any other method must be made to approach in order to be acceptable. A good many people seem to think that this is not what they want; but I have quite as much faith in the future of the heliochromoscope as I ever had in the future of half-tone block-making in line. It has been a revelation to me, and I believe it will be to the whole world.

I met a professional artist in London, a clever painter of both portraits and landscapes, who spent what seemed to me a very long time studying a bouquet of flowers reproduced in the heliochromoscope, and left it only to return to it again and again, as if it fascinated him. At last a friend asked him for an expression of opinion upon the merits of the device. After some hesitation, he said that he had attended one of my lectures at the Royal Institution, hoping and expecting to go away and report the failure of another attempt to reproduce the natural colours by photography. He had not been able to do so, but was forced to confess that colour-photography is a fact. The demonstration was conclusive to him. The heliochromoscope will have no better friends than the artists, for whom it will not only reproduce nature, but the masterpieces of art as well, in such manner that they can be studied in far-distant lands almost as well as in the galleries where they repose.

In the far West I met the representative of a large New York firm of importers of Oriental rugs. He assured me that he was ready to pay a hundred dollars out of his own pocket for a duplicate of the heliochromoscope that I showed him, with a set of photographs of the rugs that he carried about with him only to show their colours. It would save his firm a good deal of money that went in expensive sample rugs, and in cost of extra baggage, and it would save him a good deal of trouble. A professional house-decorator spoke much to the same effect. Evidently, the heliochromoscope will have many fields of usefulness, so many, perhaps, that its function as a source of drawing-room entertainment, for which alone many have supposed it to be adapted, will prove of secondary importance. But I shall be greatly surprised if, even for the latter purpose, it does not become more popular than the stereoscope ever was, although it is necessarily a much more expensive instrument.

F. E. Ives.

SCIENTIFIC RESEARCH IN PHOTOGRAPHY.*

There has been of late a wholesome spirit of emulation in the different classes of work, and a happy tendency among our members to abandon the old albumenised paper printing, and to turn attention to the superior results obtainable by the platinum (hot and cold bath), the carbon, the bromide, the gelatino-chloride, and plain salted paper processes, specimens of each of which can be inspected to-night. The desire is to gradually raise this Club out of the narrow groove of ordinary photography, and in the near future to encourage scientific inquiry into the causes of the various phenomena connected with the subject by independent original research. More men are wanted—earnest workers in all branches which the amateur can, with the aid of a little perseverance, master, viz., photo-micrography, meteorological photography, photographic ceramics, and also some of the simpler photo-mechanical operations. Then, others are wanted who will experiment in the direction indicated by the Diazotype, the production of photographic impressions by means of the aniline dyes. And lastly, some men with a certain amount of training in chemistry and physics, who will devote some of their efforts to the solution of that very difficult problem, photography in natural colours.

A short account of what had been done in this direction from the time of Dr. Seebell, in the year 1810, downwards to the researches of Edmund Becquerel, with dates and names of chief workers were given in a paper by the Vice-President (Mr. W. H. Harrison) in the *Photographic News Year-book* for 1890, and any one contemplating experiments in this direction, cannot do better than refer to the article.

* Extract from the Presidential Address at the opening of the Brixton Camera Club Exhibition, November 17, 1892.

It appears that the first person to obtain coloured impressions upon paper prepared with chloride of silver was Dr. Seebeck, in 1810. Next, Sir John Herschel, in 1839 and 1840, in a communication to the Royal Society, stated that he had obtained a coloured impression of the solar spectrum on paper prepared with chloride of silver. Afterwards Hunt, in 1844, stated that fluoride of silver is very sensitive to the coloured rays, and that the yellow was well marked. That particular colour could hardly be detected in the images by Seebeck and Sir John Herschel. Then followed the splendid experiments and researches of Edmund Becquerel, an investigator who did more than almost any one to develop colour photography, and his best results were obtained by taking a highly polished silver plate and depositing thereon, by means of the voltaic current a thin film from a solution of the perchloride of copper in an aqueous solution of chlorine gas, and subsequently drying the plate by means of a gentle heat, and on plates prepared in this way he is said to have obtained all the colours in a picture. More recently—in fact, down to the present moment—M. Lippmann has not only produced photographs in natural colours, but has shown us that the result is brought about by the interference of light, and that to get a vivid impression it is necessary to have a brilliant, reflecting surface in optical contact with the sensitive film, and that, no doubt, is why the coloured images which were occasionally produced on the old Daguerreotype silvered plates were produced—viz., because the actual surface of the plate was iodised, so that there was necessarily absolute contact between the sensitive and the reflecting surfaces. Lippmann's plan is to coat a glass plate with collodion or some other transparent medium containing bromide or other salt of silver, and then to make the prepared plate one side of a cell or trough with the sensitive film turned inwards, and the cell so produced is then filled up with pure mercury. In this way a brilliant surface is in optical contact with the sensitive film, and after due exposure the plate is developed with pyrogallic acid, and fixed with the usual hyposulphite of soda solution, when a faintly coloured image results. I have tried the effect of exposing a bichromatised gelatine plate under a number of strips of different coloured glass to bright sunlight, but obtained no pronounced result, no doubt because I omitted the indispensable reflecting surface, as I find Lippmann has tried the same experiment with the addition of a reflecting surface, and has thus obtained his best and latest results.

Considering the large number of persons who, from various causes, practice what has been facetiously called the "black art," it seems almost impossible but that there must be a goodly number present who have had a certain amount of scientific training in chemistry and physics, and a knowledge of these subjects is an immense help, no less to the beginner than to the advanced worker. I cordially invite all who have had that training and who happen to be present to attach yourselves to the Club, and thus not only give the members the benefit of your superior knowledge, but to contribute your mite to the further development and ultimate success of our scheme for the establishment of the Society on a sound scientific basis. Let not beginners be frightened away by the projected programme. All must have a beginning, and failures frequently teach us more than our successes. I trust that this Exhibition will be the means of causing a large accession of members, for it is not to be forgotten that photography is not only one of the most fascinating and absorbing hobbies that it is possible to take up, but that it requires for its successful accomplishment patience, care, neatness, cleanliness, precision, and close observation, combined with thoughtfulness, and so directly tends to develop those qualities which are absolutely necessary if we would make life a success. J. Reynolds, M.D., F.R.G.S.

ON THE METHOD OF EXAMINATION OF PHOTOGRAPHIC LENSES AT THE KEW OBSERVATORY.*

The third condition that has been laid down as being necessary before the Kew method gives theoretically correct results is that the nodal point should be the same for white light as for photographically actinic rays. This may be hypercritical, but if, in fig. 5, C″ and B″ represent the images as seen on the photographic plate, C′ and B′ those seen by the eye on the ground glass, N_1 the mean position of the nodal point of emergence for visible rays, and S the mean position for actinic rays, then it is evident that FN_1 will be the principal focal length found by the observation, whereas SF will be the quantity required in calculations with regard to enlargements or illumination. If the lens give any distortion, N_1 would represent the centre of similitude for visible rays and S that for photographically actinic rays; the condition might, therefore, have been more rigidly defined by stating that the point of similitude for visible rays and that for actinic rays must occupy identical positions for parts of the field between the points of observation. As far as can be judged, this is a negligible source of error in all cases.

Continued from page 745.

A fairly large angular movement of the swinging beam, about 14½° on each side of the axis, has been adopted at Kew in order that any error in the measurements on the ground glass may produce a small proportional error in the results. But it should be observed that the smaller this angle, the less will be the errors just discussed, and by lessening the angular movement these errors can be reduced to any extent, but only with a proportional loss in the general accuracy of the results obtained.

This is not the place to enter into a general discussion on focometry, but a few words to justify the choice of the Kew method may perhaps be permitted. Many of the known means of finding the principal focal length depend in principle on measuring the relative size of the object and the image, and the foregoing remarks on the errors involved are more or less applicable to them, thus showing that they are open to the same criticisms on theoretical grounds as the work at Kew. Many methods of focometry have to be rejected because they do not measure the distance from the nodal point, and others are unsuitable because the calculations or successive adjustments involved render the operation too lengthy. There are, no doubt, many instruments—as, for instance, that devised by Professor Silvanus Thompson—which do give the true focal length as measured on the axis with theoretical accuracy, but these have not, as a rule, been specially designed for photographic lenses. One method, which is hardly open to criticism on theoretical grounds, may be mentioned in a little greater detail as being that specially recommended by the International Congress of Paris; this is the elegant plan which Commandant Moëssard proposes to carry out by means of his instrument, called the *Tourniquet*, which is described in Wallon's *Traité élémentaire de l'Objectif Photographique* and elsewhere. Advantage is taken of the principle that if a lens is revolved about an axis passing through the nodal point of emergence, the image of a distant point will not appear to move if seen through a fixed eyepiece; thus, by successive adjustments and trials, the lens can be so placed that an axis does pass through the nodal point; and, by measuring the distance between this axis and the focus of the eyepiece, the true focal length can therefore be obtained. Since a movement can be detected before it can be measured, a smaller angular movement is required with this method than with the Kew testing camera, and therefore, as far as distortion is concerned, greater, but not absolute, theoretical accuracy is obtained. As for the coincidence of the visual and actinic centres of similitude, better theoretical results are only obtained by this method on the assumption, which is probably a true one, that these points approach each other as the point of observation gets nearer the axis.

By taking observations some fourteen degrees away from the axis of the lens, we conclude, therefore, that we obtain the most rapid and accurate method of focometry; and, in the case of the image within this limit being disterted, that the focal length thus obtained, even though it is not identical with the principal focal length measured on the axis, is what the photographer in reality wants to ascertain. The Kew method is therefore, we believe, open to no criticism on theoretical grounds as far as the value of the results is concerned.

Under the same heading as the principal focal length is also recorded the "back focus," or the length, from the ground-glass surface to the nearest summit of the lenses, when the focus is adjusted on a distant object. The difference between the principal focal length and the back focus therefore gives the distance of the nodal point of emergence from the inner summit of the lenses, thus enabling any one to mark the place where the principal plane cuts the mounting. In symmetrical lenses, which are generally used for plan work, the position of the principal plane of incidence, or the point from which the distance of the object must be measured when regulating enlargements, can also be marked; for it then occupies the same relative position with regard to the furthest summit of the lenses—that is, to the outside end of the lens—as the nodal point of emergence does to the inner summit of the lenses.

12. *Curvature of the Field, or of the Principal Focal Surface. After focussing the plate as its centre, movement necessary to bring it into focus for an image —— inches from its centre = —— inches.*

Ditto for an object —— inches from its centre = —— inches.

" " —— " " = —— "

The following is the method of finding the curvature of the principal focal surface. The image of a distant object (or of the collimating telescope) is thrown on that point on the ground glass where the axis of the lens cuts it, the focus is accurately adjusted, and the focus scale is read off. The swinging beam is then moved so that the image comes succes-

sively to positions at convenient intervals from the centre of the plate, and on each occasion the focus is adjusted afresh, and the focus scale read off. By subtracting the central reading from these outer readings, the results recorded in the Certificate of Examination are obtained.

But a mere observation of the curvature of the focal surface does not at once indicate how serious is the evil effect of this defect in the lens. Further consideration is necessary to settle this point. If the results furnished by this test are plotted in the form of a curve, they will represent a section through the principal focal surface; let A F in fig. 6 be

Fig. 6.

such a curve, and let $c\,d\ (=\mu)$ be the movement necessary to bring the plate into focus at its margin; let N_1 F be the principal focal length, and E G $(=s)$ the effective aperture of the lens. The effect of this curvature is to make the image of a point appear on the plate as a disc, except on the circle or at the point where the principal focal surface either cuts or touches the plate. If the photographic plate is in the position M′F′, such that it bisects $c\,d$, then the discs of diffusion will be greatest at the centre and at the margin of the plate; and any movement of the plate from this position will increase the size of the disc at one or other of these places; if the photographer adjusts his focus so as to produce the best general focus, $e\,g\ (=\delta)$ will therefore be the diameter of the largest disc of diffusion on his plate. Assuming that this position of the plate has been adopted, and that the lens gives no distortion, then, by similar triangles, it can be seen that—

$$\mu = \frac{2\delta}{s}(f-\mu) = \frac{2\delta f}{s} \text{ nearly} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1).$$

But the C.I. No. of stop $= \frac{f_2}{100\,s^2}$; and therefore

$$\mu = 20\delta\sqrt{(\text{C.I. No. of stop})} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots(2).$$

The accompanying Table gives the value of δ for the different value of μ and for stops of different numbers; and thus the size of the greatest disc of diffusion can at once be seen from the results of the examination as recorded in the certificate.

When judging the quality of a lens by means of the results given in this test, the above table may also be used in the following manner:—Decide on the value of δ (the diameter of the greatest disc that will be tolerated in the image of a point), and find, from the results recorded in the Certificate of Examination, the difference of focus, μ, between the centre and the extreme corner of plate; then, knowing these two quantities, the table at once shows what is the C.I. number of the stop that can be employed under these conditions, or, in other words, with what rapidity the lens will work.

It may also be remarked that this table gives for any part of the plate, and for stops of given size, the *radius* (δ) of the image of a point after the plate has been removed a distance, μ, from its proper focus in either direction, the movement being measured in a direction perpendicular to the plane of the plate.

According to the recommendations of the International Congress, lenses should generally be supplied with stops, numbered according to the proposed system, in the following series: 1, 2, 4, 8, 16, 32, 64, &c. I should have thought that the series, 1, 2, 3, 5, 10, 20, 30, 60, &c. would have been more convenient for the purposes of mental arithmetic; for example, with the two last stops in this series, the exposure would be the same multiple of the half minute or minute that the unit of exposure is of the second. Both series have therefore been included in the above table.

The results recorded in the certificate under this heading may possibly also be useful to the photographer in another way, by enabling him to decide approximately what part of the ground glass he should use when

Table giving μ (the difference of focus in inches of the centre and the margin of the plate; or, after focussing the plate at its centre, the amount it has to be moved to bring the margin into focus) with reference to the size of disc of diffusion and number of stop.

C.I. No. of Stop.	δ, the diameter, in decimals of an inch, of the maximum disc of diffusion when the plate is in the position giving the best general focus.							Approximate ratio of effective aperture to focal length.
	0·002.	0·004.	0·006.	0·008.	0·010.	0·012.	0·014.	0·016.	0·018.	
64	0·32	0·64	0·96	1·28	1·60	1·92	2·24	2·56	2·88	f·80
60	0·31	0·62	0·93	1·24	1·55	1·86	2·17	2·48	2·79	·77
56	0·30	0·60	0·90	1·20	1·50	1·80	2·10	2·39	2·69	·75
52	0·28	0·57	0·85	1·13	1·41	1·70	1·98	2·26	2·55	·71
48	0·28	0·55	0·83	1·11	1·39	1·66	1·94	2·22	2·49	·69
44	0·27	0·53	0·79	1·06	1·32	1·58	1·84	2·10	2·38	·63
40	0·25	0·51	0·76	1·01	1·27	1·52	1·77	2·03	2·28	·57
36	0·24	0·48	0·72	0·96	1·20	1·44	1·68	1·91	2·15	·55
32	0·23	0·46	0·68	0·91	1·13	1·36	1·58	1·81	2·04	·49
30	0·22	0·44	0·66	0·88	1·10	1·32	1·53	1·75	1·97	·45
28	0·20	0·39	0·59	0·78	0·98	1·18	1·37	1·57	1·76	·40
24	0·18	0·36	0·54	0·72	0·89	1·07	1·25	1·43	1·61	·40
22	0·18	0·32	0·48	0·64	0·80	0·96	1·12	1·28	1·44	·30
20	0·15	0·31	0·46	0·62	0·77	0·93	1·08	1·24	1·39	·33
18	0·14	0·28	0·42	0·56	0·70	0·83	0·97	1·11	1·25	·32
16	0·13	0·25	0·38	0·51	0·63	0·76	0·89	1·01	1·14	·23
14	0·11	0·23	0·34	0·45	0·57	0·68	0·79	0·91	1·02	·24
12	0·10	0·20	0·29	0·39	0·49	0·59	0·69	0·78	0·88	·22
10	0·09	0·18	0·27	0·36	0·45	0·54	0·63	0·72	0·81	·20
9	0·08	0·16	0·24	0·32	0·41	0·48	0·56	0·64	0·72	·20
8	0·07	0·14	0·21	0·28	0·35	0·42	0·48	0·55	0·62	·17
7	0·06	0·11	0·17	0·23	0·28	0·34	0·39	0·45	0·51	·14
6	0·04	0·08	0·12	0·16	0·20	0·24	0·28	0·32	0·36	·10
5	0·03	0·07	0·10	0·14	0·17	0·21	0·24	0·28	0·31	·87
4	0·03	0·06	0·09	0·11	0·14	0·17	0·20	0·23	0·25	·82
3	0·03	0·05	0·08	0·10	0·13	0·15	0·18	0·20	0·23	·71
2	0·02	0·05	0·07	0·09	0·12	0·14	0·16	0·18	0·21	·63
1	0·02	0·04	0·06	0·08	0·11	0·13	0·15	0·17	0·19	·58
———	0·02	0·04	0·06	0·08	0·10	0·12	0·14	0·16	0·18	·50

focussing. In fig. 6, let k be the point where the plate M′F′ cuts the principal focal surface when in the position which has been proved to give the best general focus; hence the image will be perfectly sharp at k, and conversely, if the focus is adjusted by looking at the point k on the ground glass, the plate will be brought to the position M′F′ required; but, since kl is half cd, there is no difficulty by interpolation or plotting to find the approximate position of k for any given distance of the point c from the axis. Look in the Certificate of Examination for cd, the difference of focus between the centre of the plate and its margin, find in the above manner the position of k, where the difference of focus from the centre is only half cd, and we get the point on the ground glass which should always be used when focussing with all stops, if it is desired to get the best general focus.

Leonard Darwin, Major R.E.

(To be continued.)

PHOTOGRAPHIC EXHIBITION AT THE "STANLEY SHOW."

Without in any way decrying the popularity, utility, or success of the Stanley Show of bicycles, &c., it may be doubted whether the addition of a photographic exhibition to the list of attractions can serve any useful object but the provision of another opportunity for these photographers whose aim it is, *coûte que coûte*, to increase their stock of medals. In justice to photography itself, we feel bound to point out that it has long since established its right and capacity to appeal *per se* to the sympathies of every cultivated section of the community, and therefore can afford to stand alone without outside assistance. We are the more confirmed in these reflections from having noticed that the "Stanley" Exhibition of Photographs, held as it was in a comparatively out-of-the-way room, appeared to be neglected by the vast majority of the visitors to the "Show"—a fact to be explained on several grounds, notably the one that those who went to the Agricultural Hall were almost entirely interested in the main attractions. Briefly, the photographic exhibition seemed a little out of place.

These remarks, however, in no way discount either the energy of the promoting Society, which we hope will meet with the reward sought, or diminish the artistic success of the photographic display, which we hasten to own was unmistakable. The Judges—Messrs. Andrew Pringle, Henry Sturmey, and J. Traill Taylor—have been congratulated on the happiness of their awards, with which no one appears to find serious fault. For those visitors who could spare an hour away from the bustle of the microcosm of the great cycling industry outside, the collection, small as it was, was well calculated to convey a very good idea of latter-day photography in some of its best phases.

It is not a little singular that the class which more than any other would seem to have given this photographic exhibition its *raison d'être*, namely, that for instantaneous cycling subjects, should have only had three sets of pictures sent in. Mr. W. H. Kitchen received the bronze medal for his snap-shots of racing cyclists, neither the gold nor the silver being awarded, Mr. A. C. Edwards taking a diploma for his series. In B (instantaneous general subjects) much creditable work was shown, Mr. J. H. Gear (a clever worker) taking the gold medal for his series, of which the yacht picture *Running into Harbour* was full of life and sparkle, and his sheep subject *Repose—Morning Light*—most artistic in the lighting and groupings. Mr. A. C. Edwards' silver medal for his hand camera shots at Niagara Falls was thoroughly well deserved, their selection and technique being irreproachable. Mr. E. M. Stone took the bronze medal for four views at Filey. Mr. Dresser's diploma pictures, notably the *Boat coming Ashore*, were good; but Mr. Dresser should guard against spotty prints. Mr. A. S. Statham also received a diploma for four small pictures, of which we preferred his nicely-finished *Ramsgate Harbour;* and Mr. E. Hawkins for *Ploughing* (an excellent study), *Off to the Rescue* (boatmen shoving off), *Grazing*, and *Becalmed*, the first-named irresistibly reminding us of Mr. Dresser when Mr. Dresser is at his best. Mr. F. W. Grants' seaside snap-shots were chiefly remarkable for their bilious tone; and Viscount Maitland's *Evening*, a wild piece of nature, well printed on bromide paper, arrested attention by its unconventionality.

Mr. H. Dudley Arnott received a gold medal for a study of fishing boats, and the same gentleman showed several other sea pictures, all of high merit, *Stalham Dyke, Norfolk*, also justly securing him the bronze medal. Mr. Dresser took a silver medal for an enlargement from a hand camera negative, the vessel ploughing through the waves being very well caught. *Off to Plough*, for which Mr. J. E. Austen gained a diploma, was a charmingly soft study of horses and landscape. The tones of Mr. S. Francis Clarke's series of landscapes were most agreeable, being of a delicate degree of warmth which falls short of obtrusiveness. In *An Introduction* Mr. E. H. Bayston very ably suggested Jan Van Beers' *My Friend Mr. White*, and those who remember that picture will appreciate our admission that Mr. Bayston succeeded in producing a very humorous imitation of it. Mr. J. A. Hodges' *A Welsh Port*, *In Conway Vale*, *Shallow Waters*, *Departing Day*, were prominent, so to speak, by their lack of striving after effect. They were poetical landscapes, faultless in selection, lighting, and printing. In the same class Mr. T. Earp, Mr. T. M. Brownrigg, and Mr. H. R. Leach showed meritorious work; and in *Winter*, by Mr. J. O. Grant, one had a picture of distinct excellence.

Class E, "pictures by the platinotype process, any subject," was especially rich in good things, although Mr. F. M. Whaley was rather fortunate in securing the gold medal for his *Worn Out*, which, when hung at Pall Mall, was passed over. It is a clever picture, but photography is a poor suggester of pathos, as so, for that matter, are most other graphic arts. Mr. Harold Baker's silver medal picture, *Strensham Church*, as well as his two of Tewkesbury Abbey, were probably the finest examples of architectural and interior work in the Exhibition, while his portraits by electric light showed that this artist has a complete mastery of this light in portraiture.

Mr. C. F. Treble's exhibition work continues to show improving excellence, and he rightly took a medal for *The Wretched Criminal*, a small child in a corner with a look of horror on its face at having been bowled out in some petty delinquency. The realism of this clever picture was remarkable. In *Who's Oo?* another baby subject, for which he took a diploma, a little child on its knees is questioning tiny doll, *Three Studies of Ladies' Heads*, and other subjects Mr. Treble proved the possession of versatile powers. The highest position in artistic and *genre* work is already at Mr. Treble's command. Mr. F. W. Edwards received a diploma for a fine reproduction of a Tinworth panel, and also showed several large reproductions of pictures and direct pictures of Westminster Abbey, Canterbury Cathedral, and the Tower, which were all excellent. Mr. W. J. Anchorn received a diploma for a Scotch interior, *Spinning and Reeling*. Mr. Douglas Pym's portrait study, *Sweet Seventeen*, was a very delightful picture of a delightful sitter—soft, artistically posed, and carefully executed. Mr. E. Benson had two capital Westmoreland views, and Mr. Ernest Spencer a fine untouched head study, looking remarkably like General Booth. Mr. Robert Terras showed an artist painting a young lady. As an interior and as a piece of composition the picture was undeniably an able one, but the sketch on the canvas did not correspond with the sitter. There were several pictures, not for competition, and of these Dr. Roland Smith's *Interior of St. Albans* struck us as being exceptionally good.

The awards in the Lantern Slide Class were as follows:—Gold medal, Mr. J. Carpenter; silver medal (two medals), Mr. E. G. Lee and Mr. J. E. Austin; bronze medal, Mr. Austin C. Edwards. Diplomas of merit—Messrs. A. R. Dresser, J. O. Grant, J. H. Gear, and W. Taylor.

Messrs. B. J. Edwards, of Hackney, showed work done with their isochromatic plates; the Autotype Company, carbon reproductions; the City Sale and Exchange, a large exhibit of novelties of various manufacture; W. Wray, of Highgate, a case of lenses. And among other exhibitors were A. F. Smith & Co., of Islington; Londale Brothers, of Leeds; Davenport, of Camberwell; H. Park, of Kingsland; Elliot Son, of Barnet (the Great Wave Picture, &c.); G. W. Secretan; Sands, Hunter, & Co., of Cranbourne-street; Namcit; R. & J. Beck, with their new "Frena" camera and enormous enlargements from negatives taken with it.

BRIXTON AND CLAPHAM CAMERA CLUB EXHIBITION.

Confined exclusively to the work of members, the annual Exhibition of the Brixton and Clapham Camera Club was held on November 17, 18, and 19. In the only two classes—direct prints and enlargments—into which it was divided, less then 300 pictures were included, and as the pictures were judiciously hung, a compact unostentatious little display was the result. On the occasion of our visit, the exhibition room was filled by appreciative visitors, whom we left sitting under Mr. C. W. Hastings' lantern lecture on "Mr. H. P. Robinson," of whom, sooth to say, non-photographic Brixtonites and Claphamites present looked as if they had never heard before.

We have not space for any detailed criticism, and, indeed, as the Exhibition was not an open one, the occasion scarcely requires it, but we may pass a word of commendation to Mr. C. F. Archer for his portrait studies; to Mr. H. Willoughby for his Exeter Cathedral interiors, to Mr. J. H. Edwards for his soft and charming views at Bexley and on the Cray, "Cloud" picture and evening view, "When the sun sinks to rest," a hackneyed subject it is true, but skilfully handled. The same gentleman's Zulu Wedding groups lent diversity to the exhibition. Mr. W. Thomas was a prolific exhibitor, and his small platinotype work admirable, both artistically and technically, was certainly the finest shown. Messrs. Buck (*Ely Cathedral—Interior*), F. W. Grant (*A Misty Sunset*), F. Goldby (*Via Mala, Switzerland*), E. Dockree (*On the Colne*), each had capital examples of their powers.

An excellent and convenient feature of the catalogue was its indication of the printing processes by which the photographs were produced. It may be of interest to note that out of the 290 or so pictures shown, only eight were on albumen-silver paper. In conclusion, we congratulate the Club on its Exhibition, which proved that among its members are many capable of achieving the best results in photography.

EDINBURGH PHOTOGRAPHIC SOCIETY'S ANNUAL EXHIBITION.

In noticing the other works exhibited here, those by Mr. Keene, of Derby, should not be overlooked, comprising, as they do, examples of the best

in the several departments of landscape proper and architectural work artistically treated. Those of Richmond Church, exterior and interior, are very good.

It is almost a new experience to have such a number of fine works by Messrs. G. W. Wilson & Co., of Aberdeen, and those of a class and importance in point of size and subject out of their usual, such as *Bait Gatherers on the Beach*, and the many pictures of the fisher-folk of Footdu (Fitdé) with the spoils of the deep (in one instance *in a clothes-basket*), to the studies of the older people depicted in *Peace* and *Retired from Sea*, and all given in the nearest approach to the effect of sepia drawings with the added truth which photography alone can give, together with selection of subject, whether accidental or grouped, and that keen appreciation of telling character which shows the artistic mind, no matter through which medium it chooses to express itself.

An upright view, looking up a wooded river bed, by Boisonnais, of Geneva, should be an object lesson to many of the members who, with quite as picturesque subjects of a similar kind, fail to hit, or feel, or see the artistic side of their representation. The figure in white gives the key to the whole picture, which, with its wealth of detail, has no obtrusive point, and this one speck gives value to the whole treatment of the subject.

It would be invidious to criticise those pictures of the members which have been taken during the Saturday rambles, as they must, upon the whole, be indebted for excellence more to accident than choice. Nevertheless, many of these show a fine sense of what goes to the making of a picture in the true selection of standpoint. One general fault there is, however, a prevailing tendency to too great a depth of printing. This takes away from the feeling of open-air, daylight work, which is more pronounced where the picture has been aided by sunshine, which should represent brilliancy and brightness, but is, among many of the examples, more like twilight or an approaching thunderstorm. *Reeds at Raith*, otherwise good pictures, are much spoiled by this treatment. "Impressio" should note this impression.

The figure pictures in Class III. are not so much in evidence as usual, perhaps the most notable is a *Breton Holiday*, by Breton. A very small *Fisher Girl*, by Gem, is a gem in its way, but it also proves that for exhibition purposes larger pictures attract the eye in many cases by reason of their size, which might or ought to be a lesson in the hanging and placing of the smaller class of pictures. An interior, by "Combined," showing an old woman lit by windows in strong light and shade, is very effective.

In Class IV. there are several landscapes of a high class, such as those by Forward, Mist, Ondo, and Combined. The Interlaken *Guy Fawkes* is a capitally treated picture, and Agricola's *Gloomy Winter* is a most carefully finished bit of photographic work of a kind difficult to give effect to, but which is here treated in the truest artistic method, in form, in tone, in chiaroscuro, the latter being wonderfully helped by the broadly treated stormy sky contrasted with the delicate rendering of the snow-covered branches of the tree group in the central part of the composition. The same artist's *At the Foot of the Pentlands* gives further proof of the feeling which can be made to invest the most common incident of every-day country life. The long sweep of the hills with their delicate atmospheric effect is a perfect study. This picture would be much improved by less of the immediate foreground being shown, which would make it finer in landscape shape as well. There are many other good works. The best of each class will, no doubt, be selected by the *vox populi* method of decision chosen by the Council.

A MODIFIED MAGNESIUM LIGHT FOR LANTERN SLIDES BY REDUCTION.

[Liverpool Amateur Photographic Society.]

There are difficulties attending the reduction to lantern size by means of artificial light which render the game hardly worth the candle, and still it is absolutely necessary frequently, even from quarter-plate, to reduce in order to produce the best effects. At this time of the year, that erratic and variable quantity "daylight" is unavailable in the majority of cases, and to become entirely independent of it with respect to reducing and enlarging, we require a light which will illuminate a large area with perfect evenness, and still give sufficient intensity to bring the necessary exposure within a reasonably short time. While experimenting in this direction, the simple fact that the portion evenly lit corresponded, more or less, with the size of the flame used, led us to conclude that, when we could produce a sufficiently large flame, our object would be attained. A great many ways in which this might be done have been carefully considered and tested, and *found wanting:* in the best cases the enormous heat evolved was against them. But, notwithstanding, Mr. Potter and myself claim that, by a simple modification, we can induce an old friend to serve our purpose.

We claim to have constructed a means of illumination which is perfectly even over a practically unlimited area, is economical and easy of manufacture, and one which will give good and satisfactory results; and though we claim this, we respectfully submit the idea as a crude one. To put the matter briefly, this light is simply our old friend the magnesium flash-light—but *in sheet form*. Equal quantities by weight of magnesium powder and chlorate of potash are placed between sheets of tissue paper, and this fired while suspended parallel with the negative.

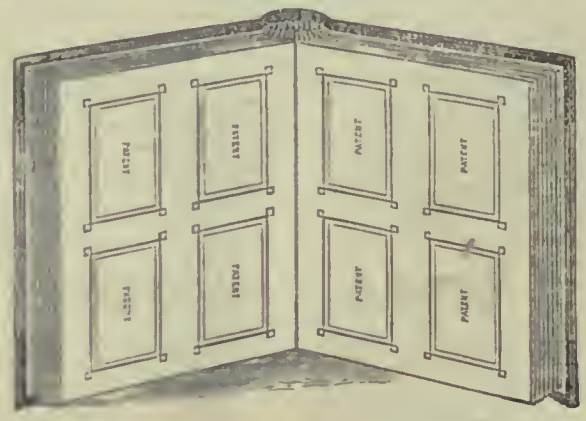
In practice, the following difficulties have been met with:—The carbonised portions of the paper have obstructed the light somewhat, the uneven sprinkling of the light-giving powder has been found detrimental to the best results, and the smoke evolved has been a source of annoyance and discomfort. These difficulties have been overcome, firstly, by using pyroxiline instead of ordinary paper; secondly, by adopting a "pellet" system of spreading the powder and thirdly, by enclosing the luminant in a smoke-trap or box.

Demonstration (half-plate size).—A piece of one-sixteenth inch zinc about 8×6 inches is perforated with holes three-sixteenths inch in diameter every half inch (actual number 117); this, laid on a sheet of the paper, has twenty grains of the mixture spread over it, and swept into the perforations; the zinc being removed, it leaves "pellets" containing about one-sixth of a grain each; a slightly starched or pasted similar sheet placed on top completes the operation, drying under slight pressure being all that is required.

C. B. Reader.

AN ALBUM FOR UNMOUNTED PHOTOGRAPHS.

The Blackfriars Photographic Company have submitted to us a specimen of their albums for unmounted photographs. These can be easily



and quickly placed in position in the albums on account of the division between the spaces being detached from the mounts. It is, we know, the habit of many amateur photographers seldom to mount their prints, and a convenient album of this kind should enable them to preserve them against all the ills to which unmounted photographs are heir.

Our Editorial Table.

Around the Roman Campagna.

By George E. Thompson. London: Simpkin, Marshall, & Co.

This work, by one of the most accomplished photographers and writers, may be considered as a species of companion to his *Spring at the Italian Lakes*, which we noticed about a year since. During his visit to the Continent Mr. Thompson has made good use both of his camera and notebook. In the present work the author takes us pleasantly through and around the Imperial city, and affords us a good insight into the manners and customs of those with whom he comes in contact, and all the time never forgets the rich scenery. This attractive work is illustrated by six selections from Mr. Thompson's photographs, beautifully printed by the Photophane Company. The price of the book is 4*s*.

Christmas Annual of The Practical Photographer.

London: Percy, Lund, & Co. Price 1s.

This Annual consists of eight studies, selected from the works of various photographers, and which have from time to time appeared in the pages of the *Practical Photographer*. They are accompanied by two pages of descriptive letterpress, in which a brief outline sketch of each is given.

Photographs of the Year, 1892.

London: Hazell, Watson, & Viney, Limited, 1, Creed-lane.

This handsome work comprises twelve reproductions of photographs shown at the Pall Mall Exhibition, together with a critical survey of the entire collection. Both selection and critique have been entrusted to Mr. Horsley Hinton. The photographs he has selected for reproduction include Mr. F. Muller's *Portrait*, Mr. B. G. Wilkinson's *Silver Strand*, Mr. Burchett's *Love Letter*, Mr. Austin's *Worn Out*, Mr. Lord's *How's that?* and pictures by Messrs. J. K. Taylor, Brownrigg, and others. The reproductions are artistically charming and faithful to the originals, notably in the cases of the first two we have named, where the printing process is imitated wonderfully well. Mr. Hinton, who is always clear and intelligible, is distinctly impartial in his critique. *Photographs of the Year* is an elegant work, and all concerned in its preparation are to be congratulated.

Mr. Jonathan Fallowfield has shown us specimens of his floral opaline tablets for window or studio, inscribed with *Terms cash* and similar necessary reminders, together with floral borders with Christmassy aspirations printed on them, and spaces left in which *carte-de-visite* photographs can be mounted. Both novelties should be useful, particularly the latter, at this time of year.

Lantern Slide Manual.

By John A. Hodges. London: Hazell, Watson, & Viney, 1 Creed-lane, E.C.

Mr. Hodges' manual appears at a seasonable time. In the course of five sections it treats successfully of slide making by reduction and contact, by the collodion, gelatine, and albumen processes. The information, if (as the author frankly admits) not new, is at least tolerably exhaustive and clearly presented. In speaking of the gelatino-bromide process, Mr. Hodges very truly observes that "success in making lantern slides depends largely upon the amount of attention that is paid to little matters of detail." The book is full of those details, and is freely illustrated, and should prove a serviceable guide to the amateur undertaking lantern slide work.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
November 28 ...	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
„ 28 ..	Gloucestershire	
„ 28 ...	Lantern Society	20, Hanover-square.
„ 28 ..	North Middlesex	Jubilee Hall, Hornsey-road.
„ 28 ...	Richmond	Greyhound Hotel.
„ 28 ...	Rosecndale	Townsend-chambers, Rawtenstall.
„ 29 ...	Lancaster	Storey Institute, Lancaster.
„ 29 ...	Leith Amateur	
„ 29 ...	Warrington	Museum, Bold-street, Warrington.
„ 30 ...	Bath	Roy. Lit. & Sc. Inst., Terrace-walks.
„ 30 ...	Barnley	Bank Chambers, Hargreaves-street.
„ 30 ...	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
December 1	Bolton Photo. Society	Baths, Bridgman-street.
„ 1	Camera Club	Charing-cross-road, W.C.
„ 1	Dundee and East of Scotland ...	Lamb's Hotel, Dundee.
„ 1	Glasgow Photo. Association	Philoso. Soc. Rooms, 207, Bath-st.
„ 1	Leeds Photo. Society	Mechanics' Institute, Leeds.
„ 1	London and Provincial	Champion Hotel, 15, Aldersgate-st.
„ 1	Oldham	The Lyceum, Union-st., Oldham.
„ 1	Tunbridge Wells	Mechanics' Inst., Tunbridge Wells.
„ 2	Brighton and Sussex	
„ 2	Bristol and West of England ...	Rooms, 28, Berkeley-sq, Bristol.
„ 2	Cardiff	
„ 2	Croydon Microscopical	Public Hall, George-street, Croydon
„ 2	Holborn	
„ 2	Leamington	Trinity Church Room, Morton-st.
„ 2	Maidstone	"The Palace," Maidstone.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

November 22,—Technical Meeting,—Mr. A Cowan in the chair.

Preparing Photographs for Exhibition.

In the course of a short discussion on this subject, Mr. W. Bedford thought it would be well to have it understood that pictures in unusual frames were not calculated to harmonise with the others, and that therefore they might have to be placed in undesirable positions.

Mr. W. E. Debenham, as regards the frames, thought that exhibitors should be left to exercise their own tastes, as possibly what one might consider artistic would be voted by another vulgar and offensive.

Mr. Chapman Jones said that when he had anything to do with exhibitions he had found the difficulty of hanging together those pictures which were surrounded by a large margin with those which were framed close up.

The Chairman had never seen pictures to more advantage than at the Crystal Palace. In one bay there were pictures with large margins, and in another pictures framed close up, and so on. There was no reason why pictures should be packed close together. Mr. Bedford's exhibition pictures, for example, should have a little margin round them.

Mr. A. Mackie referred to the case of a set of photographs printed on deep pink paper, the mounts being bright blue with gold lines.

Mr. Debenham instanced a celebrated picture which was passed by the Judges on account of the frame. He did not think Judges were influenced by the mounts of photographs as seemed to be thought, and remarked that the Chairman and probably every one present were quite capable of judging photographs whatever their mounts might be.

Mr. Chapman Jones said that when prints on the walls of an exhibition actually faded in six weeks it was time to say that prints must be done by some permanent process. Of course it was difficult to draw the line, and something ought to be done in that direction.

Mr. Debenham said the objection raised by some exhibitors to state the processes by which their pictures were produced was unreasonable, and thought that for educational purposes they should be stated where they were not evident.

Mr. Bedford thought, in judging photographs as works of art, it should not be stated as a merit that they were produced by any particular method.

Ferrotype Photography by Flashlight.

Mr. L. Nievsky gave a demonstration of flashlight photography with dry ferrotype plates. The plates are contained in a receptacle placed on top of the camera, and after focussing one is placed in position, and the exposure being made it passes into a chamber where it is submitted to the successive action of the developing, fixing, and washing baths. Mr. Nievsky took the portraits of several of the gentlemen present. He observed that the first few plates were generally fogged, but as soon as a little of the hypo got mixed with the developer clearer pictures resulted.

Mr. J. A. Harrison exhibited a camera-stand attachment for enabling the camera to be tilted at a considerable angle. It consisted of a double frame, the lower one being fixed to the tripod, the upper one, to which the camera is attached, apparently moving by means of a lazy-tongs attachment.

The meeting then concluded.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

November 17, Mr. Lewis Medland in the chair.

Messrs. Williams (of Rhyl), F. Scott, W. Packham, and L. J. Atkinson were elected members.

Mr. H. Rapson produced the negatives referred to at last meeting. The reason assigned for the stain was insufficient washing before intensification.

Removing Silver Stains from Negatives.

Question: "Is there any reliable formula for removing silver stains from gelatine negatives?"

Mr. J. S. Teape said he could always remove such stains with alcohol, and stated that, when applying it, it was advisable to work on as large a surface of the negative as possible.

Mr. W. Debenham considered that rubbing with alcohol reduced the density of the negative, which was not always desirable.

Mr. P. Everitt referred to a statement in one of the journals that Mr. Horatio Nelson King had discovered a process for removing silver stains, but it was not yet published.

Mr. Snowden Ward had heard from a professional friend of his that prolonged soaking in hypo, say, for as much as twenty-four hours, would remove the stain satisfactorily.

Mr. Debenham said that silver reduced by development is in a very different condition to that reduced by light, therefore it might be expected that strong hypo might affect the silver when in the brown state, while it would not affect it in the black form.

Mr. Snowden Ward, as to the prevention of the stains, would recommend the use of two different kinds of varnish on the negative, one on top of the other.

The New Methylated Spirit.

The Chairman asked what course to pursue to obtain pure methylated spirit? In using the spirit as sold now, he had found a great difficulty in removing the greasiness from the films.

Mr. A. Cowan stated that it was necessary to apply to Somerset House for a permit to obtain the pure spirit from a methylator.

Mr. J. S. Teape, with reference to the use of ordinary as against chrome alum, produced some prints on "Hutinet" paper, which he said, before development was finished, were covered with large blisters. He tried soaking before development in ordinary alum, which he found greatly reduced the size of the blisters, but they were still all over the print; but, treating other prints with a preliminary bath of chrome alum, four grains to the ounce, he found, on development, no trace of blisters.

This being the Monthly Lantern Night, slides were shown by the Chairman (Mr. Medland) of various animals and rare birds at the "Zoo," and views at Yarmouth and elsewhere, and by Mr. J. A. Sinclair of views in Belginm, and also by Messrs. Everitt, Dando, and Debenham.

It was announced that December 1 would be a special lantern night, Mr. F. W. Hindley having promised to show his large collection of slides entitled *Scenes from Ireland*.

Holborn Camera Club.—November 18, Mr. H. Thompson in the chair.—Mr. J. H. AVARY read a paper on *Development* (see page 758.) He developed a number of negatives after reading his paper, and also a large transparency on an ordinary plate.

Fillebrook Athenæum (Photographic Section).—November 21.—Preliminary arrangements were made for the Exhibition on March 1 and 2, 1893. Discussions followed on the subjects of transparent markings on gelatine lantern plates (which it was suggested might be caused by imperfect mixing of the emulsion) and the new amidol developer. With regard to the latter, Mr. H. W. BENNETT showed six negatives taken with a view of testing the relative developing powers of amidol and pyro. Three Ilford Ordinary plates were exposed for four minutes each, a Mawson, an Ilford Special Rapid, and an Ilford Ordinary for two minutes each, the subject being a light vase. One of the Ilford's that had received four minutes, the Ilford Special Rapid, and the Mawson were developed with pyro and ammonia, proving, as intended, somewhat under-exposed, the Special Rapid very much so, the negative being very poor and badly stained from forced development. The Ilford Ordinary and the Mawson gave very fair negatives. Another four minutes Ilford Ordinary was developed with pyro, potash, and soda, this requiring very prolonged development to give the same vigour and detail as in that treated with pyro and ammonia. The third Ilford Ordinary that had four minutes' exposure was developed with amidol, the stock solution mixed according to the maker's instructions, being diluted with three times its volume of water, and also restrained with a half grain of bromide of potassium to each ounce of solution. The development was completed in about two and a half minutes, the deepest shadows commencing veiling, the appearance of the plate being that of one considerably over-exposed. The Ilford Ordinary that had received two minutes' exposure was then developed with amidol, the composition of the developer being exactly the same as in the preceding. Result, full detail and good gradation, though too thin to be considered a good printing negative; no stain or fog of any kind. This result was obtained with an exposure that had failed to produce a presentable negative at all on an Ilford Special Rapid, which is said to be twice as fast as an Ordinary. In this case Ilford Ordinary, developed with amidol, was decidedly faster than a Special Rapid developed with pyro and ammonia. Mr. Bennett promised to make further experiments before the next meeting, and specially to try to obtain greater density with amidol, expressing the opinion that this developer should be of great value for shutter work, where it was frequently necessary to give far less exposure than was desirable, even if the negatives had to be subsequently intensified.

Kensington and Bayswater Photographic Society.—November 21, the President (the Hon. L. M. St. Clair) presided.—A lantern lecture was given by Mr. C. DIXON on *Holland House*. The slides were taken from negatives made by the lecturer nineteen years ago by the wet-plate process. Their brilliancy compared very favourably with the more modern gelatine negatives. Mr. Dixon gave a description and history not only of the place itself, but also of its generations of inhabitants.

West Surrey Photographic Society.—November 16, Lantern Evening.—A collection of transparencies was passed through the lantern, explanations being given by Mr. DAVISON. The slides were contributed by Commander Gladstone, R.N., Messrs. T. W. Bright, H. L. Andrew Martin, Graham, A. R. Berry, F. W. Berry, J. S. Bond, and others. This proved to be the most successful public evening that the Society has ever held, and the Committee feel so much encouraged that they intend to continue the series of "free public" evenings at intervals during the winter months. The lantern was lent and worked by Mr. F. W. Berry.

Richmond Camera Club.—November 14, Mr. F. P. Cembrano, jun., in the chair. Mr. FAULKNER showed two prints on platinotype new paper which had been exposed to damp. One had been developed with glycerine in the developer; it turned partly red on development, but this redness, as well as some parts of the image, had disappeared on fixation. The other print, in the development of which the glycerine had been omitted, was of good quality, the deepest shadows being of a good rich black. Both pieces of paper, before exposure and development, had had the same opportunity of getting spoilt by moisture, and he could therefore not account for the great difference in the results. Mr. ANDASKER suggested that the piece that had become bad must have been outside the roll, and had therefore protected the second piece inside. Mr. GREEN wanted to know the simplest way of reducing whole plates to lantern size. Mr. WILLIAMS said he attached his camera to a baseboard, at the end of which he placed a box with an aperture in it to carry the negative to be reduced. The space between the negative and the camera he covered with a black cloth. To obtain the best results, reducing should be done by daylight. Mr. DAVIS had tried Mr. E. G. Richardson's system of using various strands of magnesium, and, although he had burnt as much as eight pieces, each one eight inches long, the transparencies were much under-exposed. The amount of smoke produced was so great that he had to clear out of his dark room after each exposure. Mr. CEMBRANO said that, with all its uncertainty, daylight was the best, as with artificial light it was difficult to obtain evenness in the lighting. For those that had no time during the day, he would recommend using smaller plates, and making slides therefrom by contact.

North Surrey Photographic Society.—November 15.—Mr. LEWIS WOLFF read a paper on *Development* (one of a series of lectures for beginners), in which he dealt only with the pyro-ammonia developer as being the one mostly in use, and which he believes to be still unrivalled. After giving a description of the uses of the components of the developer, and explaining how, by varying their proportions, developers may be compounded to meet the requirements of varying exposures and subjects, he developed two plates, the first being a properly exposed one, which yielded a good negative with a normal developer; the second, a plate which had received exactly four times the exposure of the other, but by greatly increasing the pyro and developing very slowly, using no alkali at the start, an equally good result was obtained, and it showed no trace of its having received so liberal an exposure. To give the beginners present a distinct idea of the functions of the chemicals used, he compared pyro to a horse, bromide to the reins, and ammonia to the whip.

Croydon Camera Club.—November 21, Lantern Night, the President (Mr. H. Maclean, F.G.S.) in the chair.—The attendance was good. Among the members present the following showed slides:—Messrs. B. Gay Wilkinson, C. Bray, H. Griffiths, H. E. Neeves, H. Maclean, A. Hirst, G. Corden, and A. E. Isaac (the last named also working the lantern).

Croydon Microscopical and Natural History Club (Photographic Section).—November 18, Lantern Night.—A large audience assembled to hear Mr. JOHN WEIR BROWN give an account of the Photographic Convention of last July, which he attended as a delegate, and large collections of views taken by himself and other members of the Convention during the various excursions were shown on the screen. Particularly noticeable were some fine architectural slides of Melrose Abbey, Abbotsford, and St. Andrews, and a series of hand-camera shots of fisher life in the little village of Newhaven.

Blackheath Camera Club.—November 15, Mr. G. S. Criswich in the chair.—A demonstration on *Lantern-slide Development* was given by Mr. J. T. FIELD (Vice-President). The demonstrator commenced by remarking that, in order to make a good lantern slide, you must first obtain a good negative, as it is useless expecting to get good slides from bad negatives. He printed and developed a few slides, using various brands of plates and the following developer:—A. Hydroquine, 160 grains; meta-bisulphite soda, 90 grains; potassium bromide, 20 grains; water, 20 ounces. B. Soda hydrate, 160 grains; water, 20 ounces. C. Soda carbonate, 2 ounces; potassium carbonate, 2 ounces; water, 20 ounces. Equal parts of A and B to produce slides with black tones, and equal parts of A and C for warm tones, with prolonged exposure, the proportions being modified according to time of exposure of slide, density or colour of negative, &c. He exposed by opening door of dark lamp and holding frame at a distance of one foot from gas flame. He pointed out that by exposing in this manner you can dispense with the back of printing frame, as no light can fall on the back of slide, and this is a great advantage when it is necessary to screen the light from any portion of the negative, as by looking through the back of the slide you can see exactly where the shadow of the screen falls. The fixing bath used contained four ounces of hypo and one ounce of soda bisulphite to twenty-five ounces of water, and was perfectly clear, though it had been in use for some weeks. He recommended the use of a clearing bath for lantern slides, especially when hard water had to be used for the other operations, the one he used himself being Edwards'. At a previous meeting of the Club, Mr. Hill had said that he was in the habit of developing isochromatic plates by yellow light, and to prove this he brought an exposed instantaneous isochromatic plate to the meeting, and developed it by the light of the Club dark lantern. This is a large gas lantern, with front and two sides formed with two thicknesses of yellow medium, the front having a light area of about two feet by one foot six inches, and sloping forward so as to throw the light down on to the developing dish, which was placed directly in front of the lamp and within a distance of three feet, thus forming a very severe test. The plate was developed, and proved to be a perfect negative without a trace of fog, though it had been once or twice held close up to the lamp for examination. This seems to prove that a deep ruby light, which is very unpleasant to work by, is not necessary for these plates; but, of course, care must be taken to prevent an undue amount of light from falling upon the plate before it is covered with the developer. There is much more danger of fogging the plate while transferring it from the slide to the dish and pouring on the developer than there is afterwards when the image has made its appearance. In this case the developer used was hydroquinone, which, when fresh, had only a very slightly non-actinic tint; with pyro and ammonia the plate would naturally be much more effectually protected. The next meeting of the Club will be held on November 29, when Mr. A. R. Dresser will give a demonstration on enlarging.

Aston Natural History and Photographic Society.—November 17, Lantern Exhibition by Mr. Townsend, of the Society, who gave his experiences of a photographic trip in the Channel Isles.—The slides were exceedingly good, and well merited the rounds of applause that greeted many of them. Mr. Tylar also showed some of his Swiss views, while other exhibitors were the President, Mr. J. W. Neville (who showed some magnificent hand-painted natural-history slides of his own production), Mr. Casson, jun., and Mr. Priddins.

Derby Photographic Society.—Mr. S. S. WATKINSON read a paper on Amateur Photography. The author disclaimed any intention to stand before the meeting as an authority on photography. The awkwardness of his position that evening was intensified by the fact that he had to speak before gentlemen who were recognised masters of the art, and, if photographic stature were taken into account, he was afraid they would require a powerful lens to discover him. The claims of photography, from an artistic point of view, were then considered. Some artists considered the death knell of fine art was sounded when the first photograph was produced, and that it was impossible to get true artistic results by means of such a mechanical science. In answer to this, the lecturer said that an ounce of proof was worth a ton of assertion, for the holders of palette and brush who practised the art of photography acknowledged their indebtedness to it, also that artists were often to be seen buying photographs of farmyard studies and broken pieces of foreground which are to be seen in shop windows. It was hardly fair to compare photography with painting; the latter was thousands of years old, while photography was still in knickerbockers, and photographers have every reason to believe—for there are many indications of it—that photography was on the eve of a greater development in the solving of the problem photography in natural colours. The lecture, which was much appreciated, led to a considerable amount of discussion at its close. Mr. Watkinson also passed round a number of pictures printed by various processes, those in platinotype being admired as giving the most artistic results. The SECRETARY announced that at the next meeting Mr. S. G. B. Wollaston, of London, would give a demonstration on the platinotype process. November 30, Captain Abney, R.E., F.R.S., would give a lecture on *Hand Cameras and Shutters*, illustrated with the lantern.

Newcastle and Northern Counties Photographic Association.—November 14,—exhibition of about two hundred lantern slides by local photographers and some of the best workers. There was a very large attendance, and the exhi-

bition was a great success. Altogether the slides formed a very fine series. There was a great number of local views, and these were all recognised and applauded. The exhibition is intended to be the first of a series, the next being announced for about a fortnight hence.

Photographic Society of Philadelphia.—October 12, the President (Mr. Joseph H. Burroughs) in the chair.—Mr. FREDERIC E. IVES read a paper on the *Heliochromoscope* (see page 758), exhibiting the apparatus, and also the special camera in which the negatives, with the necessary triple image taken through a single lens, were made. The wonderful results shown excited the highest admiration and favourable comment from the members present. Mr. FRANK S. LEWIS mentioned that, in developing film negatives lately, he had noticed that on lifting them out of the tray for examination, at the points where the back of the film rested on the fingers, the heat of his hand seemed to be communicated through the film so as to accelerate the development at those points. This was particularly noticeable in the skies of the negatives. He had also noticed that with some plates the strong contracting and adhesive power of the gelatine had caused it to pull off part of the outer surface of the glass around the edges of the plate. This seemed to be due to the glue-like character of the gelatine used, and illustrated the process largely used for producing a peculiar rough-surfaced glass for decorative purposes. A member asked why, in the case of an interior view, which had an hour and a half exposure, a streak of sunlight, which could be assumed to be greatly over-exposed, had developed intensely black instead of giving the thin image generally resulting from over-exposure. Dr. MITCHELL thought it came from a second reversal of the image at that point, the usual thin image of over-exposure being again reversed and showing black. Mr. C. W. MILLER said that, if an over-exposed negative were developed long enough, it would become black all through, as with the streak of sunlight. But, usually with such negatives, they were soon found to be over-exposed, and the developer modified accordingly, the development being stopped before intense blackness was reached. A member stated that in photographing in Florida, the Yellowstone Park, and other places where the sky was intensely bright, the skies were almost always over-timed and thin, and asked for a remedy. Dr. MITCHELL suggested holding the sky back with a colour screen and orthochromatic plates. Mr. CARBUTT recommended washing the plate off when the sky had reached the proper intensity in developing, and then, with a tuft of cotton or soft brush, continuing to apply the developer to the foreground until a harmonious result was obtained. Mr. IVES practised another method, which was to reduce the over-developed portion of the negative with Farmer's solution, applied in a similar manner to that recommended by Mr. Carbutt. This he did after fixing, and in daylight, which was quite an advantage. Dr. MITCHELL spoke in high terms of some interior views in the Alhambra, taken by Mr. Cembrano, Secretary of the late Photographic Convention, held in Edinburgh. These pictures had the strongest possible contrasts of light and shade, and he understood they had been developed on the plan described by Mr. Carbutt.

Photographic Society of Japan.—October 7, Mr. Edmond R. Holmes in the chair.—The new concentric lens of Messrs. Ross & Co. was shown by Mr. W. K. Burton, along with work done by it, and by other wide-angle lenses of the same focal length. The new lens did not give absolute definition with the maximum aperture of *f*-16, but it gave exactly the same definition at the edge as at the centre of a fairly large-sized plate. With an aperture of *f*-22 it gave absolute sharpness very nearly to the edge of a plate 22×12, the lens being twelve inches focus, and a flat object at right angles to the axis of the lens being focussed. In fact, the field was truly flat, and this was the first lens of which such a statement could be made. A universal lens by the same firm was also shown. This was of the type of the rapid symmetrical, but was twice as rapid. It was an outcome of the new Jena optical glass. Mr. K. Ogawa, as well as Mr. Burton spoke of its high qualities as a portrait lens. The Foreign Secretary had been asked to report on a sample of Mr. J. B. Obernetter's plates. He had found them very rapid, although not quite up to the rapidity of the most sensitive plates in the market in Japan, and of exceptionally good quality. A very ingenious portable metal tripod stand, each leg going into a small tin box less than three inches long, was presented to the Society by Mr. R. Mitomo. A set of small prints on bromide paper was shown by Mr. K. Arito, and were much admired.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 20,620.—"The Rotary Hand Camera." W. H. JACKSON.—*Dated November* 15, 1892.

No. 20,649.—"Improvements in Apparatus for Regulating the Speed of Photographic Shutters or the like." A. S. NEWMAN and J. GUARDIA.—*Dated November* 15, 1892.

No. 20,679.—"Improvements in Frames for Printing Magic Lantern Slides." C. S. SCOTT.—*Dated November* 15, 1892.

No. 20,795.—"An Improved Photographic Printing Process." J. GRAY.—*Dated November* 17, 1892.

No. 20,835.—"Improvements in or relating to Photographic Hand Cameras." L. A. FRANKS.—*Dated November* 17, 1892.

No. 20,848.—"A New or Improved Photograph Apparatus." W. PATERSON.—*Dated November* 17, 1892.

No. 20,922.—"Improvements in Protectors for Glass Plates for Photographic and like Purposes." E. MARTIN.—*Dated November* 18, 1892.

No. 20,986.—"Improvements in and relating to Photographic Cameras." Communicated by F. B. Hill. D. YOUNG.—*Dated November* 18, 1892.

HACKNEY PHOTOGRAPHIC SOCIETY'S EXHIBITION.—The medal in the landscape class of this Exhibition, awarded to Mr. Austin, was a bronze, not silver.

Correspondence.

PHOTOGRAPHIC PRIVILEGES AT THE PARIS EXHIBITION.

To the EDITOR.

SIR,—I see that a correspondent inquires for the address "of the firm who had control of the photographic privileges in the Paris Exhibition." The "photographic privileges" were not under the control of any firm. The Executive kept the managements in their own hands, and made a certain charge—I forget the amount—to anybody who desired to take photographs in the Exhibition. The permission thus granted did not include the right to photograph exhibitors' stands.—I am, yours, &c.,

H. T. WOOD.

Society of Arts, John-street, Adelphi, London, W.C., November 20, 1892.

THE MADDOX TESTIMONIAL FUND.

To the EDITOR.

SIR,—Having very lately received the promised and highly-valued Testimonial from the Hon. Secretary to the London Committee (Mr. Andrew Pringle), may I solicit the favour to offer through your pages to each of the signatories the expression of my highest and deepest obligation, at the same time that I present my sincerest thanks to the members of the Foreign Committee and their Hon. Secretary, Mr. C. J. Sharp.

I also beg to tender my fullest acknowledgments to the Editors of the foreign journals who have so kindly given their assistance, and likewise to express to the members of those Societies, who have so graciously affiliated me as an honorary member, my highest esteem for such distinguished honour.

To the contributors to the Funds, both at home and abroad, I beg to offer every expression of gratitude on the part of myself and family, and to state that the amounts have been duly invested for our mutual benefit. The foregoing will, I trust, be accepted as a faint testimony to my indebtedness, and the sincerity of my expressions.—I am, yours, &c.,

November 18, 1892. R. L. MADDOX.

To the EDITOR.

SIR,—Will you kindly do me the favour to insert in your next issue the enclosed list of the amounts received in connexion with the Maddox Foreign Fund, which is now closed, and, through your columns, permit me to express the thanks of the members of the Foreign Committee for the kind support given to their appeal.

The amounts have been duly handed to Dr. Maddox for investment, and, I am sure, have been highly appreciated by him. Please accept the thanks in advance of—Yours, &c., CHARLES J. SHARP, *Hon. Sec.*

71, *French-street, Southampton, November* 19, 1892.

1892.				£	s.	d
January	12	By	Credit Lyonnais Geneva, per editor *La Revue Suisse*	45	11	5
,,	22	,,	,, ,, ,, ,,	1	1	0
,,	,,	,,	The editor of *Les Annales Micrographiques*	3	19	4
,,	,,	,,	Edmund Sharp	2	2	0
,,	,,	,,	P.O.O., Belgium	0	10	0
,,	,,	,,	Miss Catharine Weed Barnes, New York	1	0	0
,,	,,	,,	Madras Society	2	2	0
,,	,,	,,	Duseldorf	1	0	0
,,	,,	,,	H. Hintze, Treasurer Fotografo Amatorklubben I Helaingfors	3	13	6
,,	26	,,	La Société Photographique à Vienne	10	0	0
March	1	,,	A. Nachet, Paris	2	0	0
,,	12	,,	Dr. E. A. Just	5	0	0
,,	19	,,	Gustav Blume, Secretary of Photographischer Verein of Hanover	2	16	0
April	9	,,	Virein Photographischer Mitarbeiter, per Herr Obman	0	19	6
,,	23	,,	Club der Amateur-photographen in Wien und der Photographischen Gesellschaft in Halle, per Herr Chas. Scolik	9	2	1
May	27	,,	Deutscher Photographen-Verein per Herren H. Schiver	14	6	11
October	6	,,	Further amount, per Herr Chas. Scolik	0	15	10
,,	27	,,	"Buffalo Camera Club," per A. Pringle	2	0	0
			Total	£107	19	7

MR. BHEDWAR'S PICTURES.

To the EDITOR.

SIR,—I really cannot enter into a discussion in this matter. I believe the editor of a paper is generally considered responsible for the accuracy of contributions accepted from anonymous correspondentcies. It is for you to propound a theory to account for the erroneous suppositions printed in your paper about Mr. Bhedwar's intentions. Having told you Mr. Bhedwar's instructions to me were not to send his pictures to Pall Mall,

it seemed unnecessary to add the fact that entries closed for the exhibition in question before the pictures arrived in England. Mr. Bhedwar has sent a letter to your contemporary in which this question was first brought up, explaining his intentions, a copy of which I have received since writing the above. I find it renders any explanation from me quite unnecessary.—I am, yours, &c., RALPH W. ROBINSON.

Redhill, November 17, 1892.

To the EDITOR.

SIR,—As Mr. Ralph Robinson's statement that Mr. Bhedwar has resigned his membership of this Society, "although, being a foreign member, he had nothing to pay for the privilege," is not quite correct, and is likely to lead to unnecessary correspondence, I shall be glad of the opportunity of saying that foreign members pay exactly the same subscription to this Society as other ordinary members. A member can, if he chooses, when going abroad, have his name transferred to the "non-resident" list and cease his subscriptions, but he then forfeits all the privileges of membership. The only advantage remaining to him is that he can resume these privileges at any time by resuming his subscriptions, without the payment of another entrance fee. Mr. Bhedwar's resignation has nothing to do with anything whatever except his leaving this country. —I am, yours, &c., CHAPMAN JONES,

11, *Eaton-rise, Ealing, W., Hon. Sec., Photographic Society of*
November 19, 1892. *Great Britain.*

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

To the EDITOR.

SIR,—Will you kindly announce to your readers that the sixth annual Exhibition of Photographs, open to all photographers of the world, under agreement between the Photographic Society of Philadelphia, the Society of Amateur Photographers of New York, and the Boston Camera Club, will be held by the Photographic Society of Philadelphia, April 17 to 29, 1893.

It is hoped that with this early announcement we may be favoured with liberal exhibits from foreign photographers, to whom special inducements and facilities will be offered. Circulars, with rules and full particulars will be issued early in December, and may be obtained on application to the undersigned.—Very truly yours,

ROBERT S. REDFIELD, *Chairman Exhibition Committee.*
1601 *Callowhill-street, Philadelphia,*
Pennsylvania, U.S.A., November 11*th*, 1892.

P.S.—Exhibits should be made ready to forward at earliest possible date, as considerable time will necessarily be consumed in transit, &c. They will be required to arrive in Philadelphia probably about March 15.

THE LEYTONSTONE EXHIBITION.

To the EDITOR.

SIR,—May I venture to ask you to kindly allow me, through your columns and on behalf of the Leytonstone Camera Club, to thank those numerous ladies and gentlemen who sent pictures to our exhibition, and we assure them that their general excellence was duly appreciated by the hundreds of spectators who thronged the halls. The vast number of exhibitors render it impossible to thank each person individually; moreover, its unprecedented and unexpected success has given me so much extra work that any little failing on my part as to prompt answering of the numerous letters that I have received, and other shortcomings, will, I trust, be excused. Once more sincerely thanking one and all who contributed to one of the most successful local exhibitions that has yet been held,—I am, yours, &c., ALBERT E. BAILEY, *Hon. Sec. Ex. Com.*

Rose Bank, South-West-road, Leytonstone.

ARTIFICIAL ILLUMINATION.

To the EDITOR.

SIR,—In your article on this subject, you refer to a method brought by myself and another before the members of the Liverpool Amateur Photographic Association, and you remark as to the danger in handling the light-giving sheets, especially when cutting to size, on account of the explosive nature of the compound of magnesium and chlorate of potash, and also, as to the difficulties when covering large areas.

I shall esteem it a favour if you will allow me to say a few words on these points.

In the first place, in dividing the larger sheets care would be taken to avoid the "pellets" of magnesium, &c.; and as these, in actual practice, are separated by nearly half an inch, in each and every direction, little difficulty would be experienced. In the second place, I am somewhat doubtful of the explosive properties of the compound as alleged, having failed after numerous trials and experiments in producing an explosion by *friction* of any description, and emboldened by my non-success in this direction, having submitted it to tests of the severest description with the object of producing, but without experiencing any sign of an explosion.

The anticipated difficulties attending the lighting of large surfaces will be found to exist only in anticipation, as the sheet can be ignited when in actual contact with a supporting piece of wood, and is in fact at its best when so used.

The method will be found in practice to be economical, the preparation of the pyroxyline paper being the most troublesome part of the whole process, but doubtless it can be purchased, ready made, at a reasonable rate.

Thanking you, in anticipation, for the space afforded,—I am, yours &c.,
C. B. READER.

Mountside, New Brighton, Liverpool, November 16, 1892.

PHOTOGRAPHIC CLUB.—November 30, Monthly Lantern Meeting. December 7, *Retouching*, by Mr. Redmond Barrett.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—December 1, Special Lantern Exhibition of *Scenes from Ireland*, by Mr. F. W. Hindley. Visitors welcome. 8, Members' Open Night.

APROPOS of "B Z's" verses, a correspondent writes:—

When "*Welcome*" is written to rhyme with "*Music*,"
The rhyme is enough to make me and you sick.

MR. DAVID RAMSAY, of the Heliotype Printing Works, Boston, has, we hear, died at Liverpool while on his way to Glasgow, his native city, for a visit. He was a well-known Scots-American of considerable ability in his business of collotype printing.

A SMART bit of work was performed at the Hackney Photographic Exhibition on Thursday week. Among the exhibits of apparatus, &c., were the Platinotype Company's new lamp for printing at night, and the Paget Prize Plate Company's new printing-out lantern plate. A negative of the Secretary was obtained, and with the above-mentioned articles a lantern slide was printed and thrown upon the screen, *the whole operation not requiring more than* 120 *seconds.*

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," 2, *York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:

G. W. Webster, Chester.—*Photograph of a bunch of grapes.*
Mackintosh & Co., Kelso.—*Portrait of the Duchess of Roxburghe.*
John Robertson, Dundee.—*Two photographs of the Rev. James Aitken.*

INQUIRER.—The reason given is that if the films were issued in larger sizes, they would not lie quite flat.

G. W. RAMSEY.—Your local gasfitter will be the better able to assist you in regard to the practical details.

H. L.—Write to the two makers named for their catalogues, which will give you all the information required.

W. HUTCHER & SON (Blackheath) send us their catalogue of lantern requisites, flash-lamps, cameras, dry plates, &c.

REV. GEO. ROLLINSON.—You will find in the present issue an article on amidol which quite answers your various queries. It will be useful to amateurs.

C. LUX.—From the description of the behaviour of the light, we surmise that the orifice of the oxygen jet has been injured in transit. Better return it to the maker for examination.

CARBON.—The best waxing solution for glass plates in the carbon process is made by dissolving five grains of beeswax in each ounce of benzol. It is imperative that both materials be pure.

FLASHLIGHT.—The oxyhydrogen light could be used for portraiture, but a quick-acting lens and very rapid plates would have to be used, otherwise the exposure would be a very prolonged one.

J. FOSTER.—An ordinary cabinet portrait lens will best serve your purpose, for by it either a *carte* or a cabinet may be taken. You might write to some maker or dealer, and obtain one on trial.

A. H. H.—There may be several reasons; but, if the same materials be used, the difference must be due in some way or other to the manipulations. In what way, it is, of course, impossible for us to say.

LEEDS.—Without knowing the amount of chloride with which the albumen is salted, and other conditions, it is impossible to say the amount of silver that each sheet will contain. The value of residues cannot be estimated from any such data as that.

T. REYNOLDS.—The iridescent markings round the edges of the negatives show that the plates were old stock or, at least, had been made some time. As the plates were not had direct from the makers, better communicate with those who supplied them.

TRIPOD.—We think your charges are exceedingly moderate. Most photographers would have charged both a higher fee and also travelling expenses.

S. L.—The loss of brilliancy in the lights of the prints is caused not by the time they were in toning, but by their being exposed to too strong a light during the operation. One hour, in even feeble daylight, will have its effect, as the result proves.

J. KERSHAW.—We should prefer the arrangement of blinds shown in sketch No. 2 to that of No. 1. Place the sitter in such a position that the side light is utilised as much as possible. If the side light can be enlarged, or, better still, extended to the top light, you will then have an excellent studio.

A. W. J.—As the man is dead, you must look to his executors for payment of your account. As the last order was ready for delivery at the time of death, the account for that must be included with the other. The goods, however, should have been delivered as soon as they were ready. The executors may now refuse to receive them.

DARK SLIDE says: "I am making a set of slides to go abroad; these are on gelatine plates. Would you recommend varnishing or not, and if to be varnished mention a suitable one? Climate is hot, and at certain times of year very damp."—Varnish the slides with celluloid in solution of amyl-acetate. Varnishes of this nature are on the market.

BRIGHTON.—1. Zinc or tin cans are quite unsuitable for keeping a stock of hyposulphite of soda solution in. For such a purpose metal vessels should never be employed. 2. See answer to "Printer." 3. From forty-five to sixty grains of nitrate of silver to the ounce of water is a good strength for the general run of papers. Some papers work better with a weak bath than others.

H. PRICE.—We fear the steps you are taking to increase the permanence of the prints will have just the contrary effect. Twenty-four hours' washing will certainly act injuriously. The shorter the time of washing, so long as the hyposulphites are removed, the better it is for the permanence of the picture. With perfect fixing, prints, with attention, can be perfectly washed in two or three hours.

H. C. (M.D.)—1. There is no patent in the mere use of changing-bags, although there may be in methods of using them. The idea of the bags themselves was made a present of to the public by G. V. J. Poirin, through our ALMANAC for 1885, page 140. 2. Numerous shutters work on the curtain form propelled by a rubber spring. Are you not mistaken in supposing this to have been patented?

M. A.—If the pictures sent are a fair sample of the lot, we fear there is very little prospect of selling the negatives to any of the publishing houses. The photographs are good, and the subjects well chosen, but they are of no interest. Country lanes in one part of the country are very much like those in another. Publishers value negatives according to the interest attached to the subject and locality.

TYRO.—1. There is such a degree of similarity among the productions of the various makers mentioned that you need have no hesitation in taking any of them, irrespective of price. 2. Iris diaphragms are certainly convenient, but are by no means necessities. Had you mentioned the focus of the single lens, which covers your half-plate sharply with *f*-16, we could possibly have deduced its value better.

H. B. C.—We should say that a whole-plate camera with three double slides with the usual etceteras is more than a lady can conveniently carry without assistance, unless she is blessed with greater physique than are most of the fair sex. By dispensing with glass and taking films the weight would be considerably reduced. Even then, we fancy, the kit would prove very fatigning on a hot day.

S. A. R. says: "I have read that gold can be recovered from old toning baths by precipitating it with a solution of sulphate of iron. I have tried this with two exhausted acetate baths, and I find nothing is precipitated. Can you explain the reason?"—If no precipitate is thrown down by the iron, it is clear that there is no gold in the solution. If the whole of the gold is used up in toning prints, none remains to be recovered.

W. RAY writes: "The lead sink of my dark room which has been in use for several years is now worn out and has to be replaced. Do you think there is any silver in it? The lead at the bottom has a thick coating upon it which I think must contain some silver. It was used in the old wet-plate days, when more silver was used than now."—It is very unlikely that there is any silver present, or, if there is, not in sufficient quantity to pay for separating from the lead.

R. WINCH asks how he can produce a very intense degree of cold by the admixture of any chemicals which are easily procurable.—If he examines our ALMANAC for 1893, which will be published in a fortnight, he will see much that may interest him on this topic. But in the meantime, he may try the following mixture:—Crushed ice, 12 parts; chloride of sodium, 5 parts; nitrate of ammonia, 5 parts. This is said to produce an intensity of cold equalling twenty-five degrees below zero.

THOS. BATES sends a photograph, a group of several persons taken by flash-light, and asks why the majority of the faces are so black, while a few are very much better. The reason is that the picture is under-exposed generally. The few figures in the foreground, and nearest to the source of illumination, are better exposed than those further behind. Had the group been better arranged so that the illumination would have been more even, and more magnesium used, the result would have been widely different.

PYRO.—It is not usual for platemakers to replace plates broken in transit. Nor could they reasonably be expected to do so under the circumstances detailed. As the packing-case was a strong one, and duly labelled "Glass," it should not have been accepted from the railway company, and signed for, if it were "completely smashed." The company would then have made compensation. The only thing now is to proceed against the railway company in the County Court, but the result will be very doubtful.

VADZE.—Apply to Hughes & Kimber, Fetter-lane, or Winstone, Shoe-lane. Either firm supply material for process work. See answer to J. Gascoine. We do not know of such a work as that mentioned.

B. R. writes: "What plates and what lenses are used for taking pictures by moonlight, such as are sometimes shown in the shop windows? Some time ago I exposed two extra rapid plates with a rapid rectilinear lens, full opening, one for twenty minutes and the other for half an hour, and did not get an image although the moon was at its full."—The so-called moonlight pictures are in reality taken in sunlight, the negative being much under-exposed. The best effects are obtained by taking the picture when the sun is near the horizon.

MIRROR asks: "Mirror to be fixed outside for enlarging. Will the common thin kind do, not plate? It will probably answer as well for reflecting, but the plate glass may be better prepared for standing wear. What is the best way of attaching to frame? Should it have something soft between the glass and wood, or not be in contact all over, and should back of mirror be painted over with anything? The wooden frame must be shut up when not in use; too many boys throwing stones about to leave permanently at an angle."—A piece of silvered glass, common or plain, will answer; the latter for choice. It will not require "backing." Place it in an ordinary wooden frame.

PRINTER writes: "Could you kindly tell me the cause of the spots on the few proofs I have enclosed? I have never seen such things before. I may say it is a fresh lot of paper just started; the old paper worked very well on a fifty-five grain bath, and this paper went well the first day on the same bath, but the second day these spots appeared. I thought first the bath was a bit strong; and reduced it, but the spots were the same. I concluded something had got into the bath. I made a forty grain fresh bath; the spots are gone, but I fail to find the cause of the spots. Can you give any opinion as to the cause in the column of 'Answers to Correspondents?'"—The cause of the spots, or rather mealiness, is that the first bath was too weak. If it was originally fifty-five grains to the ounce, it had clearly become much weaker by use. Make it up to its original strength and it will again work all right.

F ♯ SHAKES HANDS WITH B ♮.

"THREE cheers for our good President—and Art,"
And three times three for Secretary D;
There lives no man could play the Hon. Sec.'s part
So well as he has done for you and me.

Your hand I grip, B nat., whoe'er you are.
You love the pathos of the minor key,
And so do I. I'll even go as far
To say, I like some works of our G. D.

It is not we, the "majors," who have said
All work is bad except the work we do;
It is the "miners" only who have laid
That unjust veto on the good and true.

B natural, be fair, be honest, and be kind!
Confess there are no "rival styles." Apart
From what you think, you'll one day find
The True alone is beautiful in Art.

F ♯.

FORTHCOMING EXHIBITIONS.

November 25 ..... *Tunbridge Wells Amateur Photographic Association. Hon. Secretary, Joseph Chamberlain, 14, Calverly Park-gardens, Tunbridge Wells.
,, 25, 26 ... *Exeter Amateur Photographic Society. Hon. Secretary, J. Sparshatt, Fairfield House, Alphington-road, Exeter.
,, 25, 26 ... *South London Photographic Society. Hon. Secretary, C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.
,, 25, 26 ... *Stanley Show (Photographic Section). Hon. Secretary, Herbert Smith, 29, Finsbury-pavement.
,, 28 ..... North Middlesex Photographic Society.
1893.
February 18..... Holborn Camera Club. Hon. Secretary, F. J. Cobb, 100 High Holborn, E.C.
March 1, 2 ..... Photographic Section of the Fillebrook Athenæum.
April 17-29 ..... *Photographic Society of Philadelphia. Hon. Secretary, R. S. Redfield, 1601, Callowhill-street, Philadelphia, U.S.A.

* Signifies that there are open classes.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1700. Vol. XXXIX.—DECEMBER 2, 1892.

COLD AS A CAUSE OF STAINED PRINTS.

Not unfrequently, when winter has set in, do we have complaints, more or less numerous, of stains appearing on prints even when a strict adhesion to formulæ successfully worked all the summer is maintained. These complaints do not emanate exclusively from photographers whose experience may be assumed to be limited, but occasionally are made by some of long standing, and the excellence of whose work otherwise has never been challenged.

The stains in question sometimes appear immediately after the prints are finished, while, on the other hand, one or more weeks may elapse ere they are perceptible, merging from a faint yellow into one of very pronounced colour, with a considerable degree of rapidity.

There is a well-known axiom to the effect that all chemical action is aided by heat, and it applies to the case before us. We have many times found by actual experiment that a solution of hyposulphite of soda of a strength quite sufficient to dissolve out of the print the hyposulphite of silver which is produced as the first action of the fixing bath on the chloride, when the solution is between 50° or 60° Fahr., fails to do so when cooled down to the temperature of the atmosphere during a cold winter day.

From this it follows that temperature forms a powerful factor in the fixing of a print, and points to the reason why a fixing and toning formula that works well in the summer may not do so in winter, unless, of course, the precaution is taken to have the fixing solution made warm or brought up to summer temperature. We may here repeat what we have formerly written, that when crystals of hyposulphite of soda are added to water to be dissolved, no matter what the temperature of the liquid is at the time, the mere addition of the crystals will cause it to fall to a considerable extent. This is easily shown by placing a thermometer in a vessel, such as a glass tumbler, of water, and, having first noted the temperature, throwing in a few crushed lumps of the soda and watching the rapid descent of the mercury in the tube. There are many frigorific salts that lower the temperature to a much greater extent than hyposulphite of soda, for example, nitrate of ammonia; but hypo does it to an extent sufficient to interfere with its property of being a fixing agent.

The obvious moral to be deduced from this is not to employ freshly made fixing bath until either by standing for a little time or by the addition of a little hot water, or by any other means whatever, its temperature shall have been raised to a point sufficiently high to ensure its not failing to do the work that is required of it. When a solution is kept ready made up, its temperature will not descend below that of the room in which it is kept; but under no circumstances ought it to be very cold when being used, otherwise may the prints suffer from imperfect fixation.

EXPOSURE AND DENSITY.

At a recent meeting of the Photographic Society of Philadelphia, reported in our last issue, two questions were discussed, which, although they appear to have cropped up independently of one another, bear a strong resemblance. In the first case a member asked why, in a negative of an interior which had received a very long exposure, a streak of sunlight, which might be presumed to be much over-exposed, appeared perfectly opaque in the negative instead of giving the thin image usually resulting from over-exposure.

One of the replies suggested that the result was due to a second reversal of the image, while another member pointed out that an over-exposed image, if developed long enough, would usually assume the dense appearance of the streak of sunlight.

The second question was as to a remedy for the thinness in the skies of negatives exposed in certain localities where the sky was intensely bright, the thinness being set down to over-exposure; in fact, a diametrically opposite effect from that complained of from the same cause in the previous question. In this instance, if the proceedings are correctly reported, with the exception of a reference to the use of orthochromatic plates and the colour screen, the remedies proposed seem to be more calculated to meet the difficulty of over-dense skies than of thin ones. However, the apparent anomaly between the two cases is worthy of a moment's discussion.

First, with regard to the suggestion of a second reversal of the image in the case of the dense sun-streak, we may say at once that we consider it directly against all experience that the image of second reversal should be stronger than the original, or what the original one might be supposed to be if in due gradation to the rest of the picture. In all the experiments we remember to have seen reported, in each successive reversal the image became weaker; in fact, after the first reversal the results have been of such a nature as to leave it doubtful whether repeated reversals really occur or not.

Further, it may be urged against this solution of the question that, in order to produce a second reversal, a much more powerful light would be required than that reflected from a streak of sunshine striking an interior wall. In the case of sunshine, or even strong diffused light, falling directly upon the lens from an open window, the case would be widely different, and then we might expect, if not a second reversal, at any rate a partial first reversal, which would produce the same

effect, namely, an image of the window thinner than it should be.

We had a negative taken in the early days of gelatine plates which clearly demonstrated the difference between the effects of over-exposure in the case of direct and reflected light. It was a church interior, and included a window through which the sun was shining, though not directly into the camera, though two or three streaks or "splashes" fell upon one side of the chancel wall. The window was—to use the expressive term then in vogue—"burnt up," being thin and transparent, with every detail of the tracery entirely lost in "halation;" the splashes and streaks of sunlight were dense almost to opacity, while the remaining details of the picture were of the average vigour of such subjects, perhaps rather thin than otherwise.

This bears out the second explanation—or partly so, we think—that the extra density was due to the long continuance of development, so far, at least, as the sun streak was concerned; but the same argument would not hold good, perhaps, with regard to the window. In other words, the statement that "if an over-exposed negative were developed long enough it would become black all through" may be true enough of a comparatively slight over-exposure, but not so where the excess of exposure has been very great. Besides this, we may add that much will depend upon the character of the plate in use, as we shall endeavour to show.

Let us go to ordinary every-day development to help us to explain. Take the case of ordinary over-exposure first; be it in portrait or landscape work, we get a thin delicate image varying in its thinness and general flatness with the degree of over-exposure. We get this result simply because—restrainers failing to keep the shadows clear—we are obliged to arrest development before a sufficient reduction has taken place to produce density; but, if we leave that plate in the developer for a few minutes longer regardless of shadows, the result will be an equally flat image, dense in the lights and filled up in the shadows, and equally devoid of contrast with its earlier stage, only requiring a much longer time to print. Turn to an under-exposed plate and we find that the high lights develop up with, perhaps, ordinary rapidity, but we have to force development to get out the details. By careful coaxing we may probably succeed at last; but while we have been giving strength to the more feebly illuminated portions of the image the same process has been going on in the high lights, until these have become dense beyond all printing utility.

Here we have the true explanation, we think, of the dense sun streak alluded to in the question, but when it comes to the matter of reversal the circumstances are quite different. In a case of real reversal, that is to say, the production of a positive image where a negative should have been, the first effect is a very faint fogging or reduction, where the excess of light has acted, and then other portions of the image which have received less light begin to appear, and rapidly leave the over exposed portion behind in the matter of density. Indeed it seems impossible by any prolongation of the time of development, or any modification of the solution, to add anything to the slight reduction first produced.

Where the reversal is only partial, or, we may say, where it is only commencing, the reduction takes place rapidly at first, as in all cases of over-exposure, but is suddenly arrested when a certain density is attained, and beyond this point it steadfastly refuses to go. This seems to be the proper explanation of the thin skies referred to in the second question, and to the transparent patternless windows so frequently found in negatives of interiors.

We have said that much will depend upon the character of the plate employed. For instance, a dense, thickly coated plate will lend itself more readily to the production of opaque images from over-exposure than one that is thinly coated or on which the particles of silver bromide are coarse and the transmitted colour blue. In the first place, the thickly coated plate has more material upon which the developer can work to produce density, while its inherent opacity tends to restrict the action of the light to its surface, or at least to partially arrest its penetration. In the thin, transparent film there is, perhaps, not silver enough to give great density under any circumstances, while what there is is subjected to a far more searching action of the light, and so placed in a far more favourable condition for reversal.

Some years ago we made duplicate exposures in one of our English cathedrals with two different brands of plates we had with us. As regards rapidity there was little if anything to choose between them but in physical characteristics one; was robust and opaque, while the other was of the blue and granular type. The first gave us almost complete opacity in the windows, with a total loss of the mullions and tracery from halation, while in the second a plain semi-transparent blank was all that told where the windows should have been. So far as the remainder of the pictures was concerned, the one plate behaved as well as the other.

Another instance recalls itself of difference of behaviour under precisely similar circumstances. In looking over a large number of negatives taken by the late Colonel Stuart Wortley in Tahiti, many of which were exposed directly in the face of the sun, we noticed that, while in some the sun's disc was represented as a sharply defined opaque circle, in others it showed a transparent circle with a softened edge. On remarking on this circumstance to Colonel Wortley, he stated that it was simply a difference in the brand of plates, and pointed out two which had been exposed within a few minutes of one another under exactly similar conditions and in one of which the sun was transparent and the other opaque.

It may be interesting to some of our readers to note, in conclusion, that where over-density follows excessive exposure there are several ways in which it can be reduced so as to bring the defective part into harmony with the rest of the picture. And further, where the over-dense portion is a church window, or similar object, although all detail of the tracery may be apparently lost, careful reduction will usually restore it. We have frequently, and with perfect success, treated such subjects by carefully rubbing down the defective portions with a tuft of cotton wool impregnated with alcohol, and so restored the most delicate details; while other operators use finely powdered pumice in the same manner. No doubt the usual reducing solutions would answer as well, though we have not tried them.

The image that suffers from incipient reversal is, however, beyond all treatment.

PHOTOGRAVURE IN AMERICA.

In the last issue of the *Journal of the Franklin Institute* is a paper on "A New Intaglio Process," that was read at a recent meeting of the Institute (see page 757 of our last issue). We should not have reprinted the paper were it not that it contained several misapprehensions as to the later phases of photogravure, which it is desirable to correct. In the paper the author embraces the opportunity to decry the processes now in vogue,

and their alleged shortcomings, in enhancement of his own, of which, by the way, he gives no details, and, in doing so, he displays a considerable degree of ignorance of what is going on in the matter of photographic engraving on this side of the Atlantic. The new process is named photo-mezzotint, as the inventor says, not because it is the most exact term to denote it by, "but because all the other good names have already been pre-empted, and made to do service in other directions." If we mistake not, this name, too, has long since been in use in connexion with mechanical photography in this country.

It is only in one short paragraph that the new process is alluded to, and there it is mentioned that the principal feature of it lies in the picture, instead of being obtained from a graduated depth of engraving, as in the case of the ordinary photo-engraved intaglio plates; it is produced from a sunken surface of uniform depth, the graduations from light to shade being secured by minute lines and stipples of varying thickness, but of a uniform distance from centre to centre. So far, according to what the inventor says, the new method would appear to resemble the system adopted for obtaining half-tone relief "process blocks." We are told that the half-tones of the new method consist of stipples of about 44,000 to the square inch. Beyond this no further details are given, but many claims are made for the superiority of the new method over all others. Indeed, the paper, except that it appears in the journal of a scientific society, reads very much like an advertisement, particularly when the final sentence is reached, in which it is intimated by the inventor, Mr. Louis E. Levy, that the process has been made the subject of an application for letters patent.

It is mentioned above that the author of the paper exhibits a great want of knowledge of what is being done out of America; he also shows an equal want of knowledge of the technics of the different processes to which he refers. This will be particularly noted in the second paragraph of the article, in which it is stated, referring to the usual methods of working, that the unaffected and unreduced portions of the exposed bichromated gelatine film are dissolved and washed out, and the film then dried. "In this condition it may be printed from direct, or it may be used as a mould to produce a reverse—several well-known methods of moulding being given—from which, in turn, a reverse can be made by casting or electrotyping." It is certainly a novelty to be told that a dried gelatine film can be printed from as an intaglio copper plate.

There is another portion of the paper to which we must take exception. After alluding to the difficulties in, and the great skill required in working, the present methods of producing intaglio plates, and that on this account the work is practised but by few, and then only by such as possess artistic capacity and training, the following statement is made:—"In only one establishment, and that in Paris, has the work been brought to a high degree of quality, and there, as well as in other workshops, the hand of the skilful retoucher is frequently to be credited with the largest share in the final result." It may be correct to say that America—although well to the fore in process blocks—is behind Europe in the matter of intaglio work of the highest order, such as the large photogravure reproductions of works of fine art; but it is certainly not the case that in only one establishment, and that in Paris, the work has been brought to a high state of perfection, or that the greater part of that perfection is due to hand work on the plate. As a matter of fact, quite as good, if not better, work of this class is now being produced in Berlin, Munich, Vienna, and other Continental cities, and also in London, as in Paris, and, in the case of Germany and Austria, with, as a rule, less hand work upon it. Furthermore, high-class photogravure is practised by more than one firm, even in Paris.

It is alleged also that the present methods of photographic engraving are exceedingly difficult, and require great skill to work them. They, like all other work, require a certain amount of practice before proficiency is attained; yet not more than is requisite in almost every other process, whether connected with the arts or manufactures; but with the new process it is implied that this will be unnecessary. Again, with regard to hand work upon the plates, at one time, it must be admitted, the high quality of many plates was, to a considerable extent, due to the work of skilled engravers; for some time, this has not been the case. Many of the best Continental photogravures are very little indebted to the engraver for their excellence; indeed, it is surprising how very little hand work there is upon them at the present time. This is in a great measure due to the recent photographic improvement in translating the colours of the original painting into monochrome. Formerly this had to be done by skilled engravers on the copper plate, but this has not been the case of late years.

As previously implied, the reason we have alluded to this portion of the paper is that many who are not familiar with modern intaglio work might be misled as to the present state of the art on this side of the Atlantic. However, we look forward with interest to the new process so freely extolled by its inventor.

The Proposed New Photographic Institution.—Much curiosity has been excited as to the progress of the movement for the establishment of a new photographic society or institution on somewhat original and comprehensive lines, to which we referred a fortnight ago. So far as we have been able to gather, while nothing of a definitive nature has been decided upon, considerable preliminary discussion and consideration of the principal outlines of the scheme have taken place among the promoters of the idea (which includes some of the foremost men in London photographic circles), and we have the best reason to expect that an announcement on the subject will shortly be made. For the rest, we may be permitted to express the belief that, when the scheme is put before the photographic public, it will be found to be conceived upon a thoroughly catholic and representative basis.

The New Comet.—There does not appear to be much probability of Holmes' comet being of great photographic interest, for already, though its size has increased, its brightness has decreased. Most observers describe the new planet as having no tail, though one gentleman, writing to the *English Mechanic*, states that it possessed, when he saw it, a tail several times longer than the comet itself.

Shooting Stars and Photography.—In connexion with this and other comets there have been several recommendations to observers to keep a brisk look-out for shooting stars, November, under ordinary conditions, generally affording a plentiful crop. Our present purpose in writing is to suggest that photographers possessed of only an ordinary camera and lens—say, for ten-inch plates—could do very useful work on the occasion of an expected star shower. Pointing the camera at the region indicated, and changing the plates—say, every five, ten, or fifteen minutes, accurately recording the time—the errant stars would record themselves, and such plates taken by a number of observers throughout the country would give a mass of information of most useful character, that would enable a very fair parallax to be obtained and serve to give the actual distance of these bodies from the earth within narrow limits.

The 1893 Convention.—It will be seen by the society news in the current number of the JOURNAL that the Devon and Cornwall

Camera Club, of Plymouth, the issuers to the Photographic Convention of the United Kingdom of the invitation to meet at the town named next year, propose at their next meeting to exhibit a series of slides of places to be visited by the Convention in 1893. The slides are afterwards to be loaned to other societies. We are happy to find, from this and other evidences, that the Club is taking so keen an nterest in the auccess of the Convention, which will be assured if the same enlightened course of giving it publicity be pursued during the coming months.

To Keep Iron and Steel from Rusting. — The number of articles in photographic use constructed from iron and steel, from rolling presses and head rests downwards, will render serviceable a couple of recipes, adapted for the purpose in other directions, which we append. One of the simplest, and which has been in use for many years, consists in coating the article with a solution of india rubber in benzol made of about the consistency of cream. It may be applied with a brush, is easily rubbed off when needed, and effectually prevents rust. A coating of more use where the "tooth" imparted by rubber would be disadvantageous, is prepared in the following way: Dissolve two parts of crystals of chloride of iron, two of antimony chloride, and one of tannin in four of water. Apply with a sponge or rag and allow to dry. A second or third coating, or more, is given in the same way that a dark colour is produced. When dry, it is washed with water, again allowed to dry, and polished with linseed oil. The antimony solution should be as nearly neutral as possible.

Photography and the Dead.—The remarks of our contributor "Cosmos" in last week's JOURNAL, referring to the publi cation of sketches from photographs of the bodies of some of those drowned in the *Roumania*, draws attention to an occasional abuse of photography. There can be no possible objection to the photographing of persons who have died from accident provided that it be done under official surveillance, and the negatives and prints retained in official custody, but when they are passed from hand to hand and published they are calculated to shock one's susceptibilities, and to give pain to the friends of the deceased. At the time of the Whitechapel murders we were aware that photographs of the remains of one of the victims were being handed about as curiosities. Such proceedings should be impossible with proper official precautions. It is bad enough for the hand camera to bring photography into disrepute by its often impertinent use, without pictures of the dead being taken and published, in defiance of all right feelings for the departed, to cast still further disrepute upon it.

An Exhibition in Japan.—Messrs. George Davison and Andrew Pringle have received through Professor W. K. Burton an invitation to English photographers to contribute to an exhibition to be organized by the Photographic Society of Japan at Tokio early next year. In a letter to the two gentlemen named, Professor Burton says:—"I should think the exhibitors would be curious to see what is the standard of taste over here. I presume you know that it is much higher and more refined than in Europe. I could readily get, say three, of the best artists to act. They would know nothing of the names of the exhibitors, or of their previous record, so that the judging would, at least, be absolutely without bias of any kind." The following are the instructions which Messrs. Davison and Pringle deem necessary for intending exhibitors:—The photographs need not all be of recent date. They will be new in Japan. Please send the best you have at liberty. They should be sent, with a separate list of the exhibits, addressed to G. Davison, Camera Club, Charing Cross-road, W.C., and should arrive on or before Monday, December 12. They should be mounted, but not framed. They will be transmitted from, and returned to, London free of charge, and will be sent back as soon as they reach London after the exhibition. We trust a good response will be given to this invitation, and shall await with considerable interest the verdict of the Japanese judges upon what we hope will be a representative collection of all schools of current photographic art.

CONTACT PRINTING.

II.

In a previous article I referred to the necessity of employing only such an amount of light in contact printing aa was best suited to the peculiarities of the negative being printed, and referred to the benefits to be derived by varying the distances that such should occupy from the light, with the interposition of a ground glass-screen, and now proceed to notice other matters of considerable importance in contact printing.

In cases where negatives of dissimilar size to that of the plate being used to print the positive picture upon are being used, it frequently occurs that only a portion of such negatives are required to form the picture, and when such portion permits of its being printed by contact such unquestionably is more easily accomplished in such a manner than would be the case were the negative placed in a copying box and reduced through the camera. In such cases, however, unless proper precautions be taken, there is considerable risk of the negative being damaged by unequal pressure, and also from the edges of the sensitive plate scratching the surface of the negative. Hence, whenever valuable negatives are being used, it is much better to resort to camera printing. With small sizes, however, such as quarter-plate negatives, contact printing may be conducted with a tolerable degree of certainty of immunity from danger.

To guard against scratches and other surface markings to the negatives and sensitive plate, special printing frames have been devised for contact printing, and when such are employed they reduce the chance of danger to the negative considerably. These frames are so constructed as not only to afford a support to the entire surface of the negative, with the view of preventing such being damaged by fracture, often caused by the unequal pressure of the sensitive plate on its unsupported centre or other part, but likewise provide a sort of box or aperture into which the lantern plate is dropped in such a manner as to prevent any slipping or sliding over the surface of the negative; by means of such an arrangement all abrasions of the two surfaces brought in contact are entirely prevented.

These frames are very handy, and should be employed whenever possible. In cases where such are not at hand, however, a very good makeshift can be readily made by any one working on the following plan.

Let it be supposed that the central portion of a whole-plate negative contains some subject of interest that it is desired to print a lantern slide from by contact. Were such to be placed in an ordinary printing frame, and the lantern plate placed over the desired portion, and the back of the frame applied and sprung up, there would undoubtedly be great risk of damage from the pressure being so excessive in the centre of the plate, and, further, a liability of the edges of the plate scratching the surface of the negative when being adjusted to its position in the dark room. These dangers are nearly entirely avoided by employing a stout sheet of glass as a front to the negative in the printing frame. Such will strengthen the negative, whilst the scratching may be avoided by employing a cut-out mask of the same size as the lantern plate. Such is easily acquired by taking a suitably sized stout mounting board, and with the aid of a cover glass and a sharp penknife cut round the edges so as to yield a clear-cut aperture of fully $3\frac{1}{4} \times 3\frac{1}{4}$. This opening is then adjusted in broad daylight, or in good gaslight, exactly over the portion of the negative it is desired to print, and any suitable method employed of holding it firmly fixed in this position until it is removed into the dark room, when the sensitive plate is easily and quickly dropped into the cut-out aperture, the back applied and sprung up, with entire confidence that not only will the exact portion desired be found on the plate, but also an entire freedom from damage to the negative.

The advantage derived from the use of these cut-out masks is very great, and especially will this be felt by those who for the first time experience the comfort of being able in the dark room to place the plate in its exact position, without any of the previous bother and trouble of slipping and sliding such over the face of the negative in the light of a dark room, until it occupies its desired position.

Another great benefit from their employment lies in the protection they afford the edge of the sensitive plate from passing rays of light, and so causing fog round the edges of the picture. Such fogging is a very common trouble with beginners who do not understand the necessity of guarding against such. Some workers, who on the other hand appreciate the benefit of such, do not hesitate to declare the necessity of further guarding against such fogging by even going round the edges of the plate with a solution of Indian ink, so as to prevent entirely all rays of light striking the plate other than those passing direct through the negative. In practice, however, I think it will be found that, provided good thick masks are employed, and

when such fit properly, they will afford sufficient protection without the further precaution of edging the plates.

Within recent years, and especially since the introduction of the justly popular lantern dry plate, there has been a growing disposition on the part of amateurs to strive after the production of red or warm tones in their lantern slides, a result generally acquired by the giving of unduly long exposures, followed by a suitable formula in developments. These long exposures, however, as a rule, tend to a distinct clogging of the high lights of the picture, and further lead to a species of halation; and therefore, whenever such tones are desired, a distinct improvement will be found by subjecting the plate to a backing of any of the well-known preventives against halation.

There is no doubt such backing helps in a wonderful degree to maintain that sparkle so desirous in a good lantern slide. I have known a decided gain to be obtained by using a backing of red sheet rubber firmly applied as a pad in the printing frame. Theoretically, it may be argued that to prevent halation such backing should be applied in optical contact with the back of the sensitive plate; but red sheet rubber, when nice and pliable, takes kindly to a good pressure, and when such is pressed in close contact there is a decided gain in the way of preventing halation. The comfort of using sheet rubber as against the application of a messy compound, that has to be removed previous to development, upon such scrupulously clean plates as are required in this class of work, will be found to be very great, and once used will never be discarded in cases where long exposures are given.

We now come to the consideration of some important matters more intimately associated with the actual exposure or printing of the plate.

In my previous article I referred to what was, all considered, perhaps as good a method as any to employ, viz., gaslight, and when such is contained in a suitable lamp, having a folding-door carrying a good sheet of ruby glass to enable its being utilised as a developing lamp as well, no better means can be found to conduct with ease and comfort a large amount of contact printing.

In dealing with negatives of unequal densities—a fault frequently caused by the uneven coating of the sensitive plate upon which the negative is taken—it frequently becomes necessary to so regulate the light that perhaps one-half of the negative be only exposed a portion of the time necessary to give the other denser parts; and this inequality, as a rule, is found to gradually merge from one side of the plate to the other, or, in other words, there are no hard-and-fast lines of inequality, but just a running gradually from thick to thin sides of the plates.

When such have to be worked upon, there is no better means to employ than the folding-door of the developing lamp for exposure.

When exposing the frame, let the thick portion of the negative be well ascertained, and then let such portion be placed in position so as to get the light first thrown upon it by the opening of the door of the lamp; then, by a judicious waving backwards and forwards of the door, almost any amount of exposure may be given to any portion of the negative, and when such is placed at, say, a distance of twelve or eighteen inches from the door of the lamp, with an intermediate ground-glass screen a few inches in advance between it and the light, the wafting of the door of the lamp backwards and forwards will act just like a blender, and work wonders in the way of yielding harmonious results in cases of great inequality.

At other times it may be necessary to subject a negative to a considerable amount of dodging, such as the application of ground-glass varnish or other non-actinic medium: but, as such treatment does not properly come under the category of contact printing, I need not at this time enter into any details of what is known as *dodging*. It is a very wide subject in itself, and perhaps at some future time I may pen a few remarks for the benefit of the readers of the JOURNAL upon this subject. Meantime, what I have written about contact printing will be found to yield immeasurably superior results to such when conducted by the happy-go-lucky method of holding a negative unsteadily in the hand at ever-varying distances to the flame of an ordinary naked gaslight.

T. N. ARMSTRONG.

PYROGALLIC ACID, OR PYROGALLOL.

GALLIC acid was on hand at the birth of photography, says "W. N." in the *Beacon*, and it, or its derivative, pyrogallic acid, has played an almost continuous part in its development in more senses than one ever since.

I say *almost* continuously, because there was a pretty long break during the reign of the wet collodion negative, when a salt of iron took its place; but the introduction of the dry plate, and especially the gelatino-bromide variety, soon restored it to its former position.

Talbot's discovery of how to produce an invisible but developable negative image was the foundation on which the wonderful and beautiful superstructure was reared, and gallic acid was the agent employed in the development, not discovered by accident, as is generally believed to have been the case with Daguerre and mercurial vapour, but by reasoning from a knowledge of the nature of the work required, and an acquaintance with the properties of the acid.

Gallic acid is found only to a very limited extent in certain vegetable productions, and its main source is the gall-nut, Aleppo galls yielding it to the extent of about fifty per cent. Gall-nuts, however, do not really contain more than three per cent. of gallic acid, and probably, unless under certain conditions, none at all. But they contain generally over forty per cent. of tannin or tannic acid, which, during the process of manufacture, is converted into gallic acid. Powdered galls are mixed with water to the consistency of a thin paste, and exposed to the air for several months, water being added from time to time to make up for loss by evaporation. The mouldy mass so obtained is boiled in a large quantity of water, filtered, and the liquid set aside, when a large quantity of gallic acid will crystallise out. This, after purification by recrystallisation, is the gallic acid of commerce, and is soluble in 100 parts of cold, and three parts of boiling, water.

Gallic acid is indebted for its early application as a developing agent to its power to reduce the salts of silver to the metallic state; the photographic image in the Talbotype as well as the wet-collodion process, being formed of metallic silver thrown down from a solution of the nitrate, and attaching itself only to those portions of the film or paper as had been acted on by light, especially when the action of reduction was suitably controlled by either acetic or citric acid.

One drawback to the employment of gallic acid was its low solubility—only a little over four grains to the ounce—and this gradually led to the employment of its derivative, pyrogallic acid, or more correctly, pyrogallol, which is not only more active, grain for grain, but soluble to the extent of one in two and a quarter, or in a little over twice its weight of water.

When gallic acid is heated to 420° Fahr. it is split up in pyrogallol and carbonic acid thus:

$$C_7H_6O_5 = C_6H_6O_3 + CO_2$$

Gallic acid. Pyrogallol. Carbonic acid.

It is generally produced by heating a dried aqueous extract of galls in a suitable wide-mouthed pot or vessel, covered by a paper cap. When decomposition takes place, the pyrogallol sublimes and is condensed on the inside of the cap in light feathery crystals, the lighter the better, in the olden times, it was supposed to be. On referring to my note-book of those days, I find I paid for pyro at the rate of fifteen shillings ($3.60), and a following entry shows the hypo cost twenty-four cents a pound. My stock dealer then was the chemist included in "The Lights of Other Days," of the last year's volume of the *Beacon*, and, as he made the hypo himself, I doubt whether, at that long price, it paid him as well as at a later period when it was reduced to five cents a pound.

Pyrogallol, like gallic acid, readily reduces salts of silver to the metallic state, and soon almost, if not altogether, displaced the less soluble and less active acid; but only to be displaced, as I have already said, by the salts of iron. With the introduction of dry plates, however, a new method of development became necessary, as the image, instead of being formed by reduction of added silver nitrate, was produced by decomposition of the silver bromide itself. And for this purpose the pyro, although acting in a different way and indirectly, was found to be the right thing in the right place.

As to the exact nature of the latent image doctors still agree to differ, but the balance of evidence is in favour of the sub-bromide theory, which is that light liberates one-half of the bromine of a molecule of the silver bromide, leaving that molecule in a state of readiness to give up the other half to anything for which it has an affinity. Nascent hydrogen, that is, hydrogen at the moment of separation from a body with which it was in combination, fills the bill, and pyro, in consequence of its greed for oxygen, gives the hydrogen a chance.

When a plain solution of pyro is poured over a plate, only a very slight action takes place; partly because pyro only acts vigorously in the presence of an alkali, and partly owing to the fact that the union of an atom of hydrogen with an atom of bromine forms a molecule of hydrobromic acid, which possesses restraining power to stop further action. The addition of an alkali serves the double purpose of vastly increasing the oxidising power of the pyro and, at the same time, uniting with the hydrobromic acid, forming the much less restraining substance, sodium, potassium, or ammonium bromide, as the case may be.

It will thus be seen that the modern dry-plate developer is essentially an oxidiser, that is, a body having a strong affinity for oxygen, strong enough, under favourable conditions, to decompose water; but it must be something more. It must be one the oxidation product of which is either insoluble in water, or, if soluble, have no injurious effect on the haloid salts or the gelatinous body in which they are retained. This to a considerable extent limits the sources from which developing material may be drawn, although recent investigation has given us several new bodies, each possessing some peculiarity that is likely to make it available. Eikonogen, hydroquinone, para-amidophenol are a few of them, and while it is possible that for certain purposes they, or one or other of them, may be better than the good old pyro, they must, in the mean time at least, take a back seat when all-round work is in question. It may be that the average photographer has in pyro the confidence begotten of long acquaintance, but the fact is clear as noonday that, however much he may experiment with those newer candidates, he turns to his old love when he wants to feel certain of being at his best.

WINTER WORK WITH GELATINO-CHLORIDE PAPER.

In the leader on page 722, which treats the question of how to expedite work for Christmas, one expedient, which very likely will prove to be a very useful one, has not been mentioned—namely, the printing process with aristotype paper with development. Since it has been found that perfect prints may be obtained on faintly exposed gelatino or collodio-chloride paper by subsequent development, the printing process with bromide paper has found a rival which cannot be over-estimated, even with regard to the rapid-printing side of the question, an exposure of a few minutes being generally sufficient to produce by development a print on aristotype paper which cannot be distinguished from a printed-out picture. Considering, on the other hand, that the aristotype process offers some great advantages over the printing process with bromide paper as regards simplicity, range of tones, cheapness, &c., it will be evident that this new process will become a very useful one in expediting winter work.

For one special brand of aristotype paper, namely, for that manufactured by the firm of E. Liesegang, of Düsseldorf, a ready-prepared concentrated developing solution has been introduced by the same firm, under the name of "aristogen." It needs only to be diluted with twelve parts of water before use, the subsequent treatment of the prints being equal to that in the well-known printing-out process with aristotype paper. The print, which, as mentioned above, may be a very faint one, is placed in this solution without being washed previously. The image begins to appear in about half a minute, and after about three minutes the development will be completed. It is well to develop it a little deeper than the finished print is desired to be, since in the subsequent fixing bath the intensity of the print will be reduced to some degree. After being well rinsed, the print should be placed in the usual combined toning and fixing bath, and after the desired tone has been obtained it is thoroughly washed in several changes of clean water. Much depends on the perfect cleanliness of the developing dishes, which should be cleaned previously with nitric acid. It is a good plan to make a few trials with prints of small dimensions, which are printed to various degrees in the printing frame. Generally, the tone obtained will be a beautiful rich dark brown.

A singular behaviour of the aristogen developer has been observed by Herr R. E. Liesegang, it giving soft prints from hard negatives, if the developing solution is allowed to act on the print for a sufficient long time. This may be attained either by diluting the concentrated stock solution to a greater extent, say with from thirty to forty parts of water, or by exposing the paper only a very short time, and using the normally diluted developer. It will be seen that this property is opposite to that shown by developers for gelatino-bromide paper, which in the case of short exposure will give a harsh print.

The above-mentioned "aristogen" developer is so far as I know a concentrated hydroquinone developer containing sodium acetate. It keeps well for a long time if kept in well-stoppered bottles.

Many other developers have been recommended for the same purpose. A good one is the following, given by S. Corsi in the *Bulletino della Soc. Fotogr. Italiana*:—

Water	100 c.c.
Sodium sulphite (concentrated solution)	10 „
Acetate of soda (20 per cent. solution)	5 „
Citric acid (20 per cent. solution)	5 „

After the ingredients have completely dissolved, a teaspoonful of pulverised pyrogallic acid should be added. The latter may, however, be replaced by ten c.c. of a ten per cent. aqueous solution of para-amidophenol, or of an alcoholic solution of hydroquinone. After development the print is placed in water slightly acidulated with citric acid, and, after well washing, it is treated in the usual way with the combined toning and fixing bath. It will, however, be necessary to modify the developer to some degree, according to the brand of aristotype paper employed.

According to Herr R. Ed. Liesegang, a faintly exposed print on aristotype paper may be developed in a concentrated aqueous solution of tannin in about twenty minutes. The tone acquired is reddish-brown, similar to that obtained with "aristogen." A slight yellowish-brown muddiness of the liquid will be produced, which, however, does not adhere to the film. The ground of the picture remains purely white. If some silver nitrate be added to the tannin solution, the latter will give prints full of contrasts. SIGMA.

ON THE METHOD OF EXAMINATION OF PHOTOGRAPHIC LENSES AT THE KEW OBSERVATORY.*

13. *Definition at the Centre with the Largest Stop, —— C. I. Stop, No. —— gives —— definition over the whole of a —— inch by —— inch plate.*

The system by which the defining power is measured consists in ascertaining what is the thinnest black line of which the image is just visible, the test being conducted in the following manner. The test-object consists of a thin straight strip of steel, about 0·1 inch wide, and about an inch long; it is capable of being rotated about an axis in the direction of its greatest length, thus, if seen against a bright background, making it appear as a black line of varying width; when presented edgewise to the objective, it is so thin that the image becomes invisible; and there is an arc so graduated that the angle subtended by the two edges of the strip at the lens can be at once read off, thus giving a measure of the apparent thickness of the line. The test-object is placed as far as possible from the lens in a darkened room (at Kew the accommodation in this respect leaves much to be desired), and beyond it is a ground-glass screen illuminated by a lamp.

In order to test the defining power of a lens in the centre of its field, the focus is first very carefully adjusted on the ground glass, and the test-object is then slowly revolved from the edgewise position, where its image is invisible, until the first appearance of a dark line can be seen against the bright background; the angular width of the line is read off, and is noted as a measure of the defining power of the lens in the centre of its field. The light of the lamp is regulated so that the image of the line can be seen as soon as possible.

Besides measuring the defining power where the axis of the lens cuts the focal surface, an observation is also made at a point representing the extreme corner of the plate of the size for which the lens is being examined, that is, at a distance from the centre equal to half the diagonal of the plate. As the object of this second test is to measure the general definition over the whole plate, the focus is taken at a position half way between the point of observation and the axis of the lens, this being the method generally adopted by practical photographers when desirous of getting the best general focus. It is necessary, moreover, that the test-object should be so arranged that the steel strip makes an angle of 45° with the horizon; for, since the diffusion of the image near the margin may be due to astigmatism, a false impression of the defining power will be obtained if the image of the dark line coincides in direction with either of the focal lines; whereas, if it bisects, the angle between them, as will then be the case, there is no error in the result from this cause. The test is not, however, conducted in quite the same way as in the first instance; the test-object is set at a known angle, and the stops are slipped in one after another, beginning with the largest and going on to smaller ones, until the image of the black line on the bright ground is first just visible; the C. I. No. of the stop with which the lens gives definition up to a known standard at the extreme corner of the plate is thus ascertained, and, as it may fairly be assumed that the definition will be no worse than this at any other part of the plate, it follows that the defining power over the whole plate comes up to or exceeds the standard selected.

It cannot be denied that the defining power is the most important quality of a photographic lens for almost every purpose, and yet the best method of testing definition has never been satisfactorily discussed or considered. If a thoroughly good test could be devised, it would be hardly necessary to examine at Kew for curvature of field or for astigmatism, for these defects are only hurtful in so far as they affect definition. But it must be confessed that the method above described is open to some

* Continued from page 761.

objections, and the following discussion is merely intended to show that it is the best that could at present be devised.

In considering this question, it was natural that attention should first be turned to the excellent arrangements adopted at Kew for testing the definition of telescopes. The method generally used, especially when dealing with instruments supplied for the public service, is to compare each one separately with a standard telescope by an observation on a distant object; telescopes sent for examination can by this means be *passed* or *rejected*, but hardly classified. But in examining photographic lenses, where there is a much greater variety of form and pattern, it would be quite out of the question to keep a sufficient number of standard lenses to be of any practical use. Thus little assistance was obtained from the experiences gained in the examination of telescopes.

It was necessary therefore to seek some method which did not depend on comparisons with standards, and, in devising such a test, the object most to be kept in view was evidently to diminish as far as possible the errors due to the variations either in the transparency of the atmosphere or in the personal qualities of the observer.

With regard to the first point, that is, the effect of fog, mist, and dust in the air, the only way to avoid errors from these causes appeared to be to conduct this test in a room. This was considered especially necessary in a climate like that of London. It is no doubt theoretically right to examine portrait lenses, or lenses for copying plans, by observations on a test-object not too far away; but for landscape lenses a distant test-object would, from other points of view, be preferable, and the adoption of the examination in a room was only the choice of the lesser of two evils.

With regard to variations due to the personality of the observer, the case is more difficult. Probably the most important consideration is that the test should not be based on a mere judgment, the reason for which one person cannot readily communicate to another. In many works on photography the extent of field over which the lens produces a "sharp" image is discussed, as if by mere inspection this could be determined, whereas no two people would exactly agree as to where the diffusion of the image was sufficient to be classed as want of sharpness, and no two objects would serve equally well for such a test. It is essential, at such an establishment as the Kew Observatory, that the observer should obtain some definite numerical result from his examination, even though it may be considered advisable to merely employ general expressions in the wording of the certificate; under any other system it would be impossible for any length of time to prevent the standards from varying.

Still more difficult is it to avoid errors from actual variations in eyesight, whether between different individuals or at different times in the same individual. Some general conditions may, however, be laid down. When the illumination of an object is very feeble, the subjective light of the eye, as it has been called by Helmholtz, plays an important part in determining the least intensity of illumination which is visible, and this subjective light is a very variable quantity; the eye increases in sensitiveness for a long time when light is excluded from it, the increase at first being very rapid, which may be another way of expressing the same fact. Hence, any feebly illuminated object must be a bad test-object, for its appearance will vary very materially according to the state of the eye. On the other hand, if the illumination is too bright, the eye will be much influenced by irradiation, and the subjective effect on the eye will be a bad indication of the true condition of the object; moreover, as irradiation is the effect on the appearance of an object produced by brighter surrounding objects, and, as this effect diminishes as the differences of shade get less, the test-object should show no marked contrasts in illumination. But, in applying these general remarks to the case under consideration, it must be remembered that it is not the test-object which is seen by the eye; it is the image of the test-object as produced by the lens under examination. Hence, it appears that the test-object should produce an image of medium intensity of illumination, and one in which there are no great differences in shade. The test-object used at Kew, it will be remembered, consists of a perfectly black object seen against a bright background, and it might therefore appear as if it were not a good selection. In order to prove that, as a rule, the differences of shade in the image are small, and that no objections can be raised to the Kew test on theoretical grounds, it is necessary to show what is the effect on the image produced by a want of defining power in the lens.

The result of bad definition in the lens is to make the image of a point occupy a sensible area on the photographic plate, and consequently to prevent the image of the edge of a surface from being sharply indicated. The general effect can be best illustrated by means of figs. 7 and 8, where the abscissæ are enlarged dimensions measured on the plate, and the ordinates indicate the intensity of illumination at each point. In fig. 7 let a, c, b represent a section through the image of a small spot of light. In fig. 8 let the curve f, h, k represent the actual image of the edge of a bright surface, which would be represented by f, d, c', k if the defining power of the lens were perfect; it is evident that $a'b'$ in fig. 8 is equal to the limiting value of $a\,b$ in fig. 7, as the spot of light becomes infinitely small. In fig. 10 is shown the effect of bringing two bright surfaces near together; that is to say, of a dark line as seen against a

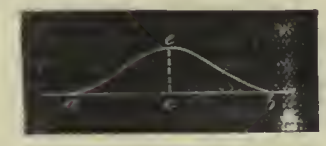


Fig. 7.

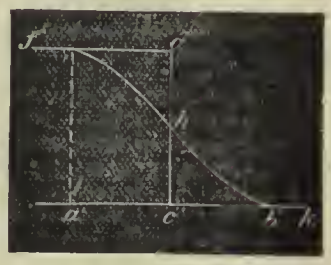
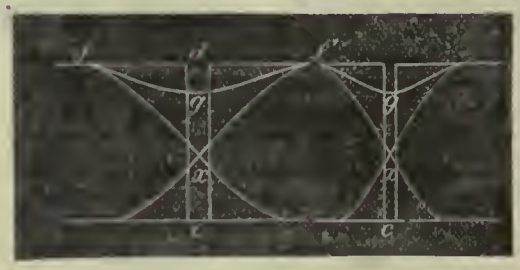


Fig. .

Fig. 9.



Figs. 10 and 11.

bright background; f, g, f' will represent a section through the image of the line, $g\,x$ being equal to $x\,c$. If this curve is turned upside down, as in fig. 9, it can be shown that it represents the image of a bright line on a dark ground.

In this latter case—that of the bright line on the dark ground—it can be readily seen that the effect of narrowing the slit of light will be to decrease the illumination $g\,d$ at the centre of the line until it becomes zero as the slit closes. The worse the definition of the lens, the sooner will the centre of the line reach the limit of visibility; but, by ascertaining what is the width of the finest bright line just visible, a good test for defining power will not be obtained for the following reasons: in the first place, the illumination of the image will be feeble, which has already been shown to be objectionable; and in the second place, since with feeble illuminations the ocular sensation varies as a first approximation as the intensity of the illumination, considerable errors would arise through the difficulty of obtaining a constant illumination through lenses of different types.

These objections do not apply, however, to testing definition by finding the width of the finest dark line that can be seen against a bright background. In this case, as the line becomes thinner, the illumination at its centre increases, until it reaches that intensity of illumination which can no longer be distinguished by the eye from the illumination of the field. If the illumination $c\,g$ in fig. 10 can be distinguished from $c\,d$ by the eye, it is evident that a blurred image of the dark line is visible, and, if any illumination greater than $c\,g$ is indistinguishable from $c\,d$ by the eye, it is evident that the figure represents the image of the thinnest black line which is visible. Fig. 11 represents generally the same condition of things as that shown in fig. 10, except that the defining power

of lens is much better; and it will be seen how much finer the line must be in this case to produce the same proportional illumination at its centre; that is to say, before the limit of visibility is used. Now, there is a certain intensity of illumination at which and about which the eye is at its maximum of sensitiveness to differences of shade, and this is when the object is what would be described as not bright and not dark; between these wide limits the minimum difference of shade visible is a fixed proportional part of the total illumination. This proportion differs with different observers, but not to a very great extent. Hence, if a plan is adopted by which a dark line on a bright ground can be made to vary in thickness, and if the illumination is arranged so that the eye is at its maximum sensitiveness (that is therefore so that the line remains longest visible as it diminishes in width), then the moment at which it disappears will occur when the difference of intensity of illumination of the centre of the line and the field is the minimum difference of shade discernible by the eye, and this will be independent of the actual intensity of the field, and will not vary much with different observers. But it has been shown that the thickness of the line does vary with the defining power of the lens, and it may therefore be concluded that the test adopted at Kew is not open to serious objections on theoretical grounds.

In the foregoing discussion it has, however, been assumed that the curve representing the image of the edge of a surface is such as that which Helmholtz has shown to be produced as an ocular effect by the circles of diffusion being due to want of accommodation of the eye itself;* it will be observed that no part of the curve is tangential to the vertical. If, however, the curve is similar to that given by the same

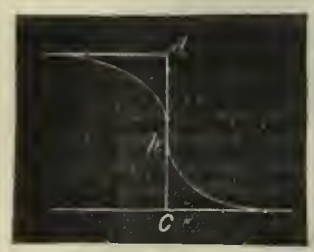


Fig. 12.

Fig. 13.

author as being due to dispersion in the eye, and illustrated in fig. 12, it will be seen that the result of gradually diminishing the thickness of a line will not be exactly as above described; for, however thin the dark line on the bright ground becomes, the intensity of illumination at its centre can never be more than twice *ch*; and, if the ratio of twice *ch* to *cd* is, less than a given ratio, the image of the black line will remain visible until it is so thin that the eye cannot perceive it. Therefore it might come about that two lenses giving images of the edges of surfaces as different as *flhf'* and *nlhn'*, as shown in fig. 13, might give equally good results under the Kew test for definition, because in both cases the limit of visibility would be due to the minimum size of the line visible by the eye, and would have nothing to do with the definition of the lens. Helmholtz remarks on the very little evil effect of a diffusion represented by the curve shown in fig. 12, since the true edge is always visible. Hence we may assume that the Kew method still gives in such cases a good practical test for definition, though it does not test the amount of dispersed light over the image of fine lines, or, as the photographer would say, the brilliancy of small objects. In fact, since the definition of an objective could only be rigorously expressed by a curve (or, more accurately, a surface) with dimensions, it is impossible for any one result to give all the information on this head which might be desirable.

As the eye is capable of detecting a difference of shade of about one per cent. of a moderately illuminated field, it will be only necessary for the curve shown in fig. 12 to be tangential to the vertical for one per cent. of its height to render the image of an infinitely thin line visible in so far as that visibility depends upon difference of shade. But take the case of a line not absolutely black, and seen against a bright background; then, in fig. 10, the illumination of the centre of the image will be represented by *gc*, *plus* some proportional part of *gd*; in comparison with the case of the absolutely black line, it can be shown that the curve must be tangential to the vertical for a proportionately greater distance before the shade of the centre of the image of the infinitely thin dark line will be sufficiently deep to form a visible contrast. For instance, if the line is illuminated to nine-tenths of the intensity of illumination of the field, the curve must be tangential to one-tenth of *dc* (see fig. 10) before this condition of things occurs. A test depending on the thickness of a line which is darkened to a definite proportional intensity of the field would therefore present this disadvantage, that there would be fewer occasions on which different degrees of imperfection of definition of lenses would show the same result in testing; such a test may therefore in future be adopted at Kew.

It should, however, be remarked that in the whole of the above reasoning it has been assumed that the minimum proportional difference of shade visible is the same in a thin line as in a thick one, which can hardly be the case. But this false assumption will not, it is thought, vitiate the general conclusions arrived at.

It is, of course, conceivable that the actinic rays will be brought to either a better or to a worse focus than the visible rays; it is believed, however, that no serious error is likely to result from the test being done by the eye, and not by photographic methods; it is almost certain that the curve representing the edge of a surface will have the same general character in the two cases, and, therefore, that the results obtained with the eye will be a good indication of those which would be obtained by photography.

Leonard Darwin, Major R.E.

(To be continued.)

* *Optique Physiologique*, Helmholtz, Paris, 1867, p. 185.

CRESCO-FYLMA.

Messrs. Hill Brothers, of Surbiton, last week gave a demonstration of this method of enlarging negatives and transparencies before the London and Provincial Photographic Association, and since then they have afforded us an opportunity of testing the properties of the solution.

The process is simplicity itself. The negative or transparency (preferably not one developed by the aid of pyro and ammonia, or a fixed alkali) is immersed in a solution consisting of three parts of the cresco-fylma to one of water. After a few minutes the film frills, and becomes detached from the support, and is, after another minute or two, transferred with its own support to a dish of plain water, in which is placed a plate the approximate size of the degree of enlargement sought. The original glass plate is then withdrawn, the film carefully guided on to the new support, and smoothed out upon it. The expansion proceeds in the plain water, attaining its maximum in the course of a quarter of an hour or so, when the enlarged picture is removed from the solution and dried on a level surface.

Following the instructions, we successfully enlarged some ¼-plate amidol-developed negatives to about half-plate size, the solution stripping the films with engaging facility and evenness. The temperature of the solution was between 60° and 70° Fahr., and the maximum enlargement to about 6¼ × 4¼ was complete in less than a quarter of an hour.

The enlarged pictures, when dry, require washing. The loss of density with this degree of enlargement is inappreciable, and, after drying, intensification may be resorted to. We note that the solution, diluted in the proportion 1 : 4, may be used for stripping purposes pure and simple.

The uses to which cresco-fylma may be put are so varied that there are few amateurs, and probably not many professionals, who could not turn it to profitable account. It is, in brief, a capital plan of enlarging without the necessity of using an optical system. Enlarged negatives and positives, stripping, transfers of enlarged pictures to various supports for ornamental purposes, enlarged opal pictures, reversing negatives for carbon and process work, are among its obvious uses.

The process is a simple and apparently reliable one, and on these grounds deserves to be known. A six-ounce bottle of the solution will, it is said, enlarge twenty-four half-plates into as many whole-plates. Hence the process is commendably inexpensive.

SOUTH LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The fourth annual Exhibition of this Society was held at the Peckham Public Hall on November 24, 25, and 26. About 600 photographs were on view, rather less than forty of the number being not for competition. In those same few pictures, however, resided perhaps the chief artistic and technical excellence of the Exhibition, since they included Mr. S. N. Bhedwar's "Naver" series and some fine examples of the President's (Mr. F. W. Edwards) treatment of Tinworth panels and architectural subjects. The Exhibition, it will be seen, was a tolerably large one numerically, and doubtless on that ground gave pleasure to its supporters and visitors; but, regarded from the standpoint of art photography, or even of mere technique, the exclusion of a considerable percentage of the photographs hung would have been a wise step.

The Judges were Messrs. F. P. Cembrano, jun., A. Horsley Hinton, and Andrew Pringle, and their awards were as follows:—

Class A, silver medal for the best general exhibit, Mr. C. H. Oakden. Class B, silver medal for the best picture exhibited, irrespective of size,

Mr. Thomas H. Powell. Class C, silver medal for the best set of six lantern slides, Mr. W. Rice; bronze medal for the second best set of six lantern slides, Mr. H. Esler. Class D, silver medal for the best series of six views taken within a radius of five miles from Hanover Hall, south of the Thames, withheld. Class E, silver medal, portraiture, best set of six, withheld. Class F, bronze medal for the best picture taken on any of the Society's excursions, irrespective of size, Mr. William Howell. Classes open for the members of the South Metropolitan Photographic Societies: Class G, silver medal for the best picture shown, irrespective of size, Mr. C. H. Oakden; bronze medal for second best ditto, Mr. H. Kirby. Class H, silver medal for best set of six lantern slides, Mr. F. Goldby (of Brixton and Clapham Camera Club); bronze medal for the second best ditto, Mr. C. H. Oakden.

Mr. Oakden's general exhibit comprised, if we mistake not, several of the excellent interiors upon which we favourably commented when they were at the Leytonstone Exhibition. His view of *Across the Octagon, Ely Cathedral*, was one of his general exhibits, and also enabled him to take a silver medal in the classes open to South Metropolitan societies. Mr. T. H. Powell's medal for the best picture exhibited was taken for the *Rising Chemist*, a small study of a child playing with a pestle and mortar. Mr. W. Howell's bronze medal for *The South Entrance, Canterbury Cathedral*, was honestly earned. This exhibitor's other work, including some well-chosen views of Arundel, carefully printed and judiciously framed, was very good. Mr. T. C. Kirby showed numerous portrait studies, for one of which he took a bronze medal. It will be observed that two medals were withheld, for what reason we did not gather. The Judges' reasons should, we think, always be made public.

Of the remaining exhibits, Mr. H. E. Farmer's were conspicuous by merit, some of his cathedral interiors being so good as, in our opinion, to have deserved an award. Mr. W. Rice's barge pictures on the Thames off Paul's Wharf were capitally treated studies, being clearly defined and well exposed, and in a frame of landscapes (some of which, by the way, were seascapes) the same gentleman showed other successful examples of pure photography, that is, photography minus impressionism. Mr. J. F. Kelly had some ably rendered Scotch views, and Mr. H. Sandland a fine study of a tiger at the Zoo.

The apparatus section appeared to be popular with visitors, especially the exhibits of the Platinotype Company, Mr. W. F. Slater (who had an appropriate display of various descriptions of picture frames on view), Messrs. D. Noakes & Son (a capital little exhibit of lanterns, accessories, &c.), Messrs. Adams, Hy. Crouch (Limited), Dollond & Co., Gill & Son, J. R. Gotz, Howell & Son, Percy Lund & Co., Moody & Gattens, Mr. H. Park, Messrs. George Philip & Sons, Mr. T. H. Powell, Messrs. W. B. Whittingham & Co., Messrs. A. R. Wormald & Co., &c.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY'S EXHIBITION.

It is a pity that so excellent a display of photographs as that collected at the Fourth Annual Exhibition of this Society on Monday last could only be on view for one evening, as it was certainly deserving of the inspection of a larger number of visitors than could possibly have gained access to them in the short space of three hours. This is equally a loss to the general public and to the Society. On former occasions we have expressed satisfaction at the hanging and other details of this annual Exhibition, and, after recent unfavourable experiences elsewhere, it is again our pleasure to note not merely the neatness and good order of the *ensemble*, but also the high general average of the work shown. The Judges were, as usual, Col. Gale and Mr. R. W. Robinson, and, although they did not award the full number of certificates placed at their disposal, we understand that the reason assigned was the difficulty of knowing where to withhold them after a certain point.

Mr. C. O. Gregory in *There's a Storm Brewing*, showed a crisp wave study which might have been improved by the absence of the figure. Regret must follow Mr. McIntosh in his retirement from photography, as in *A Gleam of Light the Gloaming follows fast*, a really poetical study of a sunset behind a bank of trees with water in the foreground, despite possibly too much heaviness in the shadows, a result was achieved which indicated the highest promises. Of Mr. Marchant's exhibits we preferred a soft delicate platinum study of *Burnham Beeches*, and *A Woodland Road* having a pleasing warm tone. Mr. Mummery took a certificate for *Low Tide on an Essex River*, a bromide study of the seashore with figures, and in his study of a lonely figure in *Across the Plough Land* he unmistakably betrayed Emersonian influence. The various attitudes of the little dog in *A Professional Beauty*, by Mr. R. H. Wynne, were cleverly portrayed; and Mr. J. C. Plunkett showed a bright but soft view of *Old Shanklin*. Mr. Marchant's *Still Waters* (the water being very naturally rendered,) *Shipping at Cowes* (crisply defined), and *Lilies* (a charming flower study), bore testimony to the President's versatility; and as a relief to the now fashionable fuzziness, Mr. C. O. Gregory's *Spring Views* in Epping Forest and Regent's Park were distinctly refreshing in their excellence of definition, exposure, and printing. The technique of these little pictures was admirable.

Mr. S. T. Chang's pictures showed a commendable advance, while Mr. F. Cherry's *Reredos, St. Albans*, was perhaps the best interior shown. We liked the pose and general treatment of Mr. C. Beadle's head study *Elsie* (a very young lady), albeit the shadows were rather sombre; and of Dr. Mason's Devonshire coast views, perhaps *Lynmouth Harbour*, breezy and animated pictorially and good photographically, was the best. Mr. A. J. Golding was awarded a certificate for *Towards Evening on the Yare*, the composition of which was materially assisted by the smoke of a steamer; there was, however, possibly too much foreground in the shape of water. Mr. Golding's other exhibits (especially *Outward Bound*), though striking us as familiar, were exceedingly good, and he is an acquisition to the Society.

Mr. T. C. Lathbridge showed good architectural subjects at Arundel, and Mr. W. Taylor took an award for a crisp and delicate study, *The Lynher*, in which the relative values of the gradations were well expressed. A *Copy of an Engraving*, by T. C. Lathbridge, was a perfect example of this class of work. Mr. Walker's *Lake Views* deserved notice by their excellence of exposure and clearness. Mr. Staveley's *Trees at Chingford; The Nave at Bath Abbey* by Mr. W. Taylor; Mr. F. Gandon's enlarged picture of *Mr. J. McIntosh;* Mr. Lathbridge's *Sussex Cottages;* Mr. A. J. Johnson's clever, unaffected study of *At a Truant School* (the latter a capital rendering of the small figures) merited notice. In *A Much Prized Picture*, a woman and boy at a rural doorway looking at a picture, while an old fellow is sitting by enjoying a quiet pipe with a smile, Mr. H. Walker showed a delightful view not unworthy of Colonel Gale. It was a really admirable picture from all points. Mr. S. E. Wall also took an award for *Going an Errand*—a boy and girl gossiping by the way; and Mr. Golding one for his series of lantern slides. Mr. Wall's exhibits, particularly *Loitering Home from School* and *When Shadows Lengthen, Little Stanmore*, were remarkably good.

We congratulate the Society on its charming little Exhibition; but we can only with difficulty forgive them the introduction into the catalogue of the word "rehalogenisation" as applied, we suppose, to reduction of negatives by the bleaching method.

TUNBRIDGE WELLS AMATEUR PHOTOGRAPHIC ASSOCIATION EXHIBITION.

The sixth annual Exhibition of this Association was held on November 23, 24, and 25. There were twenty-eight exhibits in architecture, fifteen interiors, seventy-seven landscapes and seascapes, ten *genre*, and a large number of lantern slides in the classes confined to members. The total number of competitive exhibits amounted to 768. In the unavoidable absence of Sir D. L. Salomons, the Exhibition was opened by the Rev. A. T. Scott. The Judges were Colonel J. Gale, Mr. G. Davison, and Mr. William Mayland. Besides the exhibits for competition there were in addition some fine photographs sent by Mr. H. P. Robinson. Among others, Colonel T. Dawes exhibited a number of interesting pictures, which were said to have been taken during the last occupation of Kandahar by the British, in 1880 and 1881, by Sir Benjamin Simpson. An interesting exhibit was a triple lantern and stand, belonging to Sir D. L. Salomons.

In Class I., architecture exterior or interior, Mr. E. R. Ashton, who sent a collection of Algerian views, gained mention for *Entrance to Great Mosque*, in each case the native figures being most artistically grouped.

In Class II., interiors, some interesting views of the drawing-room at Broomhill and Sir David Salomon's workshop came from Mr. J. D. Morgan.

In Class III., landscape and seascape, Mr. G. Lewis secured honorable mention. The Rev. A. T. Scott sent a frame of half-plate pictures, in which the effects were very picturesque. Mr. J. Chamberlain, the Secretary, sent two pictures taken by a pinhole instead of a lens.

In no less than thirteen classes (in some of which there were numerous entries) the Judges withheld the medals on the self-provided "ground of insufficient merit." A Judge's duty is to judge, and, if these three gentlemen were incapable of making the awards in the various classes in accordance with what they conceived to be the relative merits of the pictures shown, they had no right to undertake the office. Under what canon of judicial privilege do they claim to fix their own standard of excellence, high or low, at their own sweet will? The wholesale

manner in which these medals were withheld at Tunbridge Wells constitutes a piece of arrogance to which we hope neither this nor any other Society will in future submit. We hope to hear more of this matter.

In the Open Classes Mr. B. Alfieri took a silver medal with the *Grey Dawn*, which was recently shown at the Camera Club, and Mr. A. Horsley Hinton was similarly honoured for his *Fenland*, he also showing *Winter's Requiem* and *Lowland Solitudes*, the latter of which was on view at Hackney, and, to our thinking, deserved recognition there. Mr. A. R. Dresser had a selection of works, including the Pall Mall *Aylesford*, and Mr. J. E. Austin showed *Worn Out*, a picture that was also distinguished there. Mrs. S. Francis Clarke repeated her Leytonstone success with *Aha!* A bronze medal was awarded to Mr. A. G. Tagliaferro for *All's Fair in Love and War*, and silver medals to Messrs. E. G. Lee and T. M. Brownrigg for lantern slides. We congratulate the latter veteran worker, who has been none too fortunate of late with his exhibits. Mr. Ralph Robinson was represented by *A Mussel-gatherer*, *Young Vagabonds*, and *A New Pet* (silver medal), the very clever and suggestive picture which we singled out for commendation at the Camera Club Exhibition. Mr. Bhedwar's series secured honourable mention, and in displays of portraiture prominent exhibitors were Mr. H. Yeo, Mr. W. J. Byrne, and Mr. Bhedwar, Mr. Ralph Robinson being the recipient of another silver medal for a really fine portrait of Sir F. Leighton, a similar award going to Mr. F. Seyton Scott for his delightful view in *Kew Gardens*. In the Professional Class Mr. Robinson was also mentioned for his *Washing Day—Normandy*.

In addition to several examples of Mr. H. P. Robinson's work, the non-competitive section comprised pictures by Mr. H. Sandland and others, as well as a large collection of apparatus. Messrs. Elliott & Son showed a capital carbon enlargement of a dog and the Wave picture. It will be seen, from the above brief notice of the principal features, that the Tunbridge Wells Exhibition had all the elements of success, no small credit for this being due to the Honorary Secretary, Mr. Joseph Chamberlain.

EXETER PHOTOGRAPHIC SOCIETY EXHIBITION.

The first annual open Exhibition in connexion with the Exeter Photographic Society was held last week, being opened by Lord Poltimore, himself greatly interested in photographic art and an experienced amateur.

In Class I. the silver medal was awarded to Mr. Edgar Dudley for a series of interiors of Haddon Hall, &c. Mr. A. Norman secured the bronze for a landscape, one of the three shown by him, *A Somersetshire Peep*.

In Class II. the Rev. J. Sparshatt, the Hon. Secretary of the Society, was the recipient of the silver medal for a domestic study, *Family Cares*, the bronze going to Colonel Hutchinson for three Moorish figure studies in platinotype. The honourable-mention card was also appended to a pretty little picture by the Rev. J. Sparshatt.

In Class III., enlargements, the exhibits were not deemed of sufficient merit for the highest prize. Miss Truscott, however, was successful in getting the bronze award for a bromide enlargement, entitled *On the Exe*.

Classes V. to VIII. were open. In the first Class the Judge gave the silver medal to a series of three land and seascape studies in platinotype by Mr. A. Horsley Hinton. Mr. Court Cole was awarded the bronze for three Oxford interiors, and Mr. Hemmons was honourably mentioned for a couple of pretty exhibits.

In Class VI. the Judge was best pleased with No. 249, *Chaff*, a seabeach study of fisher life by Mr. J. E. Austin, who also showed *The Love Letter*, which was also much admired. The bronze medal went to *How's That?* by Mr. R. H. Lord. Mr. J. E. Austin received honourable mention for his *Worn Out*, and Mr. C. B. Moore's picture, *A Veteran's Tale* (No. 267), was similarly honoured.

In Class VII., enlargements, the silver medal was withheld, but a bronze was awarded to Mr. A. Drysdale's *On the Coquet*, one of two sent in, and *Punchinello*, contributed by the Woodburytype Company.

For lantern slides, Class IV., No. 406, Mr. C. Cole, and No. 413, Mr. J. W. Huggins, were placed equal for the bronze medal.

In Class VIII. Mr. J. E. Austin carried off the silver medal, the bronze going to Mr. E. G. Lee, while Mr. A. Pringle and Mr. Taverner were honourably mentioned, the former for Spanish architecture and the latter for flowers.

The Judge, Mr. W. D. Welford, while being unable to compliment the members upon having displayed any great advance upon the work of last year, yet spoke encouragingly, and urged the members to give increased study to pictorial effect rather to mere reproductions of objects in front of the camera. Effort in this direction was, he said, apparent in the present Exhibition, and the great majority of the frames contained work of fairly good technical merit, but lacking in artistic merit.

AWARDS AT THE EDINBURGH PHOTOGRAPHIC SOCIETY'S EXHIBITION.

At the close of the stipulated period for the expression of judgment by the members (November 22) of the best pictures exhibited by members, the Council opened the closed box in which these billets were deposited, and on examination found that the majorities had expressed their opinions to be as follows, carrying the awards stated:—

Class II. Best picture taken during the 1892 Saturday rambles.—Bronze medal, Mr. John C. Whyte.

Class III. Best figure study taken since November, 1891.—Bronze medal, Mr. Jas. C. H. Balmain.

Class IV. Best landscape taken since November, 1891.—Silver medal, Mr. Jas. Patrick; Bronze medal, second best, Mr. W. Lamond Howie.

In the lantern slides competition, the Committee awarded the first prize to Mr. Charles Reid (silver medal), and the second to Mr. James Patrick (bronze medal).

The Exhibition has been fairly well attended, and expression has been given to the wish that it should be kept open a little longer, it not having been probably sufficiently advertised; but, there being no admission money, that would have been expensive.

Our Editorial Table.

W. & D. Downey's Art Studies.

Published by Marion & Co.

At a price so low as to be entirely within the means of every one who loves to be the possessor of a collection of fine photographs, Messrs. Marion are issuing a series of admirable "art studies" from the studio of Messrs. Downey. They are from the life, and depict such feelings and emotions as *Resignation* or *Meditation*, or such character subjects as *The Flower Girl*, *Cecilia*, *Aspatia*, &c. The posing and lighting are just what one would expect from artists of the Messrs. Downey's standing—soft and well defined, without the semblance of want of detail in any part. Things of beauty, they will, being printed in collotype, prove "joys for ever." We urge upon photographers the propriety of possessing pictures of this high class as studies. The ink selected is a warm engraving black, suggestive of platinotype. That there will be a great demand for such charming photographs goes without saying. We have not been informed how many the series consists or will consist of, but this can be learned from the publishers, who are to be congratulated upon putting really admirable artistic pictures within the reach of all, even of the poorest of photographers.

Todd-Forret Magnesium Lamp Specimens.

Mr. A. H. Baird, Lothian-street, Edinburgh, who is the maker of the Todd-Forret lamp, of which we spoke in terms of commendation early in the year, sends a parcel of Meisenbach specimen prints from negatives obtained by its agency, and which show its capabilities. A feature in the lamp is the possibility of giving both instantaneous and time exposures. We are glad to learn that it has a steady and increasing sale.

Christmas Annuals.

Detroit Free Press.—This contains two illustrated stories, one of which, "The Heralds of Fame," by Luke Sharp, is probably the best that this versatile author has ever written. It gives the adventures of a sparkling young American lady and two poets when crossing the Atlantic to New York. The other is "The Tale of the Raven Inn," a haunt of highwaymen in Epping Forest in former times. Both are finely illustrated.

Figaro Illustré.—The illustrations and whole-get up is French throughout, and are printed in bright colours. The text is in the English language, although another edition is in French. It is issued in Boussod, Valadon, & Co.'s best style.

Yuletide—Cassell's Christmas number—contains several comic political and other cartoons, and a good deal of funny reading under the title of "The New Babylon; or, the Dream, the Demolition, and the Democracy."

Convention Stereoscopic Slides.

By A. Seaman, Chesterfield.

Among those who brought stereoscopic cameras with them to the Edinburgh meeting of the Photographic Convention was Mr. Seaman, who is well known as a photographer of ripe experience. He has sent us some of the results of his work on that occasion, embracing mainly groups taken during the ontings of the Convention, and which vividly recall pleasant times and scenes in congenial company at Melrose, St. Andrews, and Callander. They are alike valuable technically and from their associations.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
December 5	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 5	Fillebrook Athenæum	Fillebrook Lecture Hall.
,, 5	Halifax Camera Club	
,, 5	Peterborough	Museum, Minster Precincts.
,, 5	Richmond	Greyhound Hotel, Richmond.
,, 5	South London	Hanover Hall, Hanover-park, S.E.
,, 5	Stereoscopic Club	Brooklands Hotel, Brooklands.
,, 6	Brixton and Clapham	376, Coldharbour-lane, Brixton.
,, 6	Exeter	College Hall, South-street, Exeter.
,, 6	Glossop Dale	Rooms, Howard-chambers, Glossop.
,, 6	Herefordshire	Mansion House, Hereford.
,, 6	Keighley and District	Mechanics' Institute, North-street.
,, 6	Lewes	Fitzroy Library, High-st., Lewes.
,, 6	North London (Annual)	Wellington Hall, Islington, N.
,, 6	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 6	Rotherham	
,, 6	Sheffield Photo. Society	Masonic Hall, Surrey-street.
,, 6	York	Victoria Hall, York.
,, 7	Edinburgh Photo. Society	Professional Hall, 20, George-street.
,, 7	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 7	Portsmouth	Y.M.C.A.-buildings, Landport.
,, 7	Southsea	
,, 7	Wallasey (Annual)	Egremont Institute, Egremont.
,, 7	West Surrey	St. Mark's Schools, Battersea-rise.
,, 8	Birkenhead Photo. Asso.	Association Rooms, Price-street.
,, 8	Birmingham	Lecture Room, Midland Institute.
,, 8	Bradford Photo. Society	50, Godwin-street, Bradford.
,, 8	Camera Club	Charing-cross-road, W.C.
,, 8	Cheltenham	
,, 8	Hackney	206, Mare-street, Hackney.
,, 8	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 8	Manchester Photo. Society	36, George-street, Manchester.
,, 8	North Kent	Gravesend.
,, 8	Oldham	The Lyceum, Union-st., Oldham.
,, 9	Cardiff	
,, 9	Holborn	
,, 9	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 9	Maidstone	"The Palace," Maidstone.
,, 9	West London	Chiswick School of Art, Chiswick.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

November 21.—Mr. W. H. Harrison in the chair.

Messrs. W. C. Hay, W. F. Jones, and J. A. Butler were elected members.

Repairing Celluloid Trays.

Mr. A. Haddon said that it might be interesting to those possessing celluloid trays to know how to repair them if they got broken. All that was necessary to do was to moisten the crack with a little acetone, then press on it a piece of celluloid while still damp. It would be better perhaps to use a solution of celluloid in acetone. Celluloid itself softened at the temperature of boiling water, and might be bent. Mr. Haddon exhibited joined and bent pieces of celluloid in illustration of his statements.

The Chairman observed that acetone was to be obtained commercially absolutely pure at a cheap rate—three to five shillings per pound.

Mr. J. S. Teape used hot water to restore mis-shapen celluloid dishes to their proper shapes.

Reversals.

A short discussion took place as to who was the first to discover that a negative from a negative could be obtained by means of the phenomenon of reversal.

Mr. T. Bolas observed that it was not altogether an unknown thing in the collodion days to secure a positive in the camera with pyro development.

Mr. F. A. Bridge said Mr. Bolas himself was the first to publish the method with gelatine plates.

Mr. Bolas believed that Mr. Foxlee had obtained positives in the camera many years ago.

Cresco-Fylma.

Messrs. Hill Brothers gave a practical demonstration of the working properties of Cresco-fylma, in illustration of which a print, another print taken from an enlarged negative made from the original negative, and a transparency from the enlarged negative were shown. Mr. Frank Hill, in taking a 5 × 4 transparency to effect the enlargement, said the process was as follows: After the plate has been some minutes in the aqueous solution of cresco-fylma, the film would frill and leave its support. The amount of enlargement depended upon the temperature of the water, the effect of using warm water being that the enlargement greatly increased. The film having become detached from the glass, Mr. Hill transferred it to a dish of water containing a sheet of glass, upon which it was then stretched out, the enlargement being to 7 × 5½. The water in which a film had been stripped could be used for stripping a negative from the glass support which might have got broken. In reference to the suggestion that there was loss of detail on account of the enlargement, Mr. Hill pointed out that in the case of the print from an enlarged negative (which he showed) as against a print from the original negative (which he also showed) there was a distinct gain in the enlargement, some lettering on a book not being visible in the original, but seen in the enlargement. In reply to Mr. Mackie, Mr. Hill said the film could be reduced to its original size, but it would lose its adhesiveness. Pyro-developed negatives were not suitable for enlargement, but would strip all right. Answering Mr. Teape, Mr. Hill stated that, in the case of a yellow negative, cresco-fylma acted as a clearing solution. Dense pyro-ammonia developed negatives were the least applicable for the process of enlargement.

Mr. Bolas described Plener's method of stripping and enlarging with hydrofluoric acid. That acid, he said, had an irritating effect on the hands. A mixture of fluoride of sodium and sulphuric acid, for the same purpose, might be kept in a glass bottle.

Mr. W. E. Debenham said that in lantern plates one often had more than one wanted; by this method of stripping and enlargement one might be able to select only just so much as one wanted.

Mr. Haddon asked what was the effect of the solution on the fingers.

Mr. Hill replied that there was not sufficient hydrofluoric acid to injure the fingers. In reply to another question, he said that a six-ounce bottle of the solution would enlarge twenty-four half-plate negatives to whole-plate size. The enlarging action did not depend in any way upon the hydrofluoric acid in the solution, but upon the other ingredients. Films which were enlarged by hydrofluoric acid alone were very rotten.

Messrs. Hill were thanked for the demonstration of what the Chairman described as a "very interesting process," and, after some further discussion, the meeting terminated.

Hackney Photographic Society.—November 22.—Mr. Hudson presented the Society with a new arrangement for using gas from any tap with the lantern. Mr. Ponlson showed some new kind of ordinary silver paper, which was glossy without having been burnished. It was not on the market at present. A demonstration was then given by the Autotype Company's representative. The lecturer proceeded to say that in 1839 it was discovered that paper with bichromate potash darkened by exposnre to light, which discovery subsequently led to finding that sized paper darkened more rapidly, and that the darkened gelatine is insoluble. Mr. Swan patented a process with pigmented gelatine. The lecturer then gave a description of single and double process of transfer. The advantages, he said, were permanency and variety of colours. Ready-sensitised paper would keep from a fortnight to a month if kept dry. To save the trouble of double transfer a mirror at an angle of forty-five degrees was used. Several exposure meters were handed round, enabling people to see how the exposure was determined upon. Demonstration was then given showing the action, single and double transfer being shown. Various questions were asked incidentally by Messrs. Avent, Gosling, Barker, Beckett, and others, and the lecture was one full of interest. The ease of manipulating the paper was surprising.

Aldenham Institute Camera Club.—November 22.—Mr. W. Vere Mignard gave *A Chat on Light*. Having shown how difficult it is to properly define light, the lecturer showed the fallacies of Newton's "emission" theory, and then briefly pointed out the essentials of Huyghen's "undulatory" theory. He showed the impossibility of light travelling in any but straight lines, and explained the principle of the "pinhole" camera. Having made it plain that light is a *sensation*, and is itself invisible, Mr. Mignard dealt with the subject of refraction, afterwards combining it with dispersion. Newton's famous prism experiment with the resultant spectrum was described, and the solar spectrum analysed. Naturally special interest was evinced in the ultra-violet rays. A careful explanation of the theory of colour, and a comparison of colour in light to pitch in sound, brought the demonstration to a conclusion.

Harlesden and Willesden Photographic Society.—This Society held its first lantern evening at the Court House, Harlesden, on Tuesday last. A large number of slides were shown, being records of members' excursions, snap-shots, &c. A public lantern and musical entertainment was decided upon, the arrangements being left in the hands of the Council.

Putney Photographic Society.—November 21, Dr. W. J. Sheppard in the chair.—Mr. Kidd, of Messrs. Morgan & Kidd, gave a demonstration on *Bromide Enlargements*. He said that bromide printing possessed advantages which practically made it indispensable to amateurs, especially during the winter, when every one engaged during the day must have found the extreme difficulty of obtaining prints by any process requiring our often-absent friend, the sun. Here, then, was an easy way out of the trouble, for bromides could be worked comfortably at our own firesides at night, with light and exposure entirely under control. As regards results, he passed round some prints which certainly would have held their own with the best of any other process. Proceeding with the subject of the evening, he stated that the most suitable negative from which to enlarge was one that was soft and full of detail, but that he had purposely brought one which was a trifle hard, so that members might see how best to get over that difficulty. Having thrown from a three-and-a-quarter-inch portrait negative a 23 × 17 enlargement on the screen, he explained the best method of obtaining a good vignette. In this case he made a pear-shaped hole—about 2 × 1½ inches—in the centre of a piece of thin cardboard, remarking that the mistake was often made of using a vignetting aperture far too large. Moving this backwards and forwards between the lens and the easel, he obtained a remarkably even and delicate vignette. When pinning up the paper, the great advantage of using a yellow glass cap for the lens was clearly shown, as the image was plainly visible, and the operator could therefore see at the very last moment that it was properly thrown on to the paper. He

strongly recommended the ferrous-oxalate developer, the stock solutions for which were made up in accordance with the followlug formula:—1. *Oxalate Solution:* Potash, neutral oxalate, 16 ounces; acid, citric, 1 drachm; hot water, 50 ounces. 2. *Iron Solution:* Iron sulphate (pure), 15 ounces; acid, citric, 1 drachm; hot water, 30 ounces. 3. *Bromide Solution:* Bromide of potassium, 1 ounce; water, 20 ounces. For use take 6 ounces of No. 1 and 1 ounce of No. 2 and a few drops of No. 3; mix in the order given immediately before development. In his opinion this developer gave the purest blacks and whites, and consequently brilliant results. Only such a quantity of bromide of potassium should be used as might be absolutely necessary to bring the developer under control, as an excess would tend to produce greenish tones. The solutions must not be alkaline, and when mixing it is necessary to add the iron to the potash, otherwise a deposit will form and make the developer muddy. With an oxyhydrogen light he gave an exposure of four seconds, and having prepared a developer of one part of iron to six of potash, he proceeded to develop, having first soaked the paper in clean water, and taken care that no air bubbles were on it. A glass bottomed dish was used, as density can better be judged by transmitted than by reflected light. The result was a print that was slightly chalky, and, in order to show how this could be improved, he exposed the same negative for eight seconds, and made up a developer of one part of iron to twelve of oxalate, with bromide as before. The development was now, of course, slower, but the print was decidedly superior to the first, being more harmonious and pleasing. The prints, without being washed, were transferred from the developer direct into a dilute acid bath, made up of one ounce of acetic acid to six pints of water, where they were allowed to remain a few minutes, and being then thoroughly washed in clean water, were placed in a ten per cent. hypo fixing bath for at least fifteen minutes. To obtain the best results, all operations should be carried through as expeditiously as possible, with clean hands and in dishes which should be specially reserved for this process, development being completed before the hypo bath is even mixed. To get rid of the hypo, Mr. Kidd recommended that the print should be taken out from the washing bath and occasionally squeegeed on the back. If this is done, two hours' immersion in running, and about five hours in several changes of still, water will be sufficient. Mr. Kidd now proceeded to make an enlargement of a landscape, with a view to showing how to print in clouds. Throwing the image on the paper, he screened the sky during exposure, taking care to avoid a hard line by moving the shade gently up and down. After soaking, the paper was developed to about two-thirds of the desired density; he then washed the developer well out in clean water, replaced the print on the easel, and printed in the sky from a second negative, now screening the partially developed landscape. The paper being wet, it was less sensitive, and the exposure was therefore proportionately lengthened. The development was then proceeded with until full density was obtained, local treatment being resorted to where necessary. The usual acid bath, washing, and fixing of course followed. Mr. Kidd advised using the lens with as large a stop as was consistent with the covering power, as small stops tend to produce flatness. If properly exposed, the image should be seen in about thirty seconds. The development should be proceeded with until the required density is nearly reached, when the developer should be poured off. It will be found that the print can then be better seen, and development stopped immediately by pouring on the acid solution. After making a few contact prints from negatives brought by members, Mr. Kidd exhibited some fine examples of collotype printing, showing results obtained by his firm's improved collotype method of producing machine-printed ink photographs. He gave an outline of the process, and explained its suitability for producing large numbers of photographic prints at a small cost for all kinds of artistic and commercial purposes. He stated that his firm had one of the largest and best equipped works in this country for carrying on this interesting process. A cordial vote of thanks was given to Mr. Kidd for his lucid and interesting lecture and demonstration.

Richmond Camera Club.—November 21, Mr. F. P. Cembrano, jun., in the chair.—Mr. ANDREW PRINGLE delivered his address on *Different Lantern-slide Processes*. He said he would neither particularise nor demonstrate any of the known processes, but he would simply discuss the theory and the salient points of each one. At the outset he protested against the idea held in certain circles that no artistic result could be obtained in a lantern slide. We all know that some people—principally the followers, not disciples, of a defunct worker—despised and condemned this mode of pictorial representation. He maintained that a slide, properly made and properly shown, was capable of as much artistic feeling as any print. We should not lose sight of the different conditions under which each is seen. One is viewed directly in our hand by reflected light; the other is indirectly transmitted to the eyes by the light of the lantern on the screen. The gradation must be the same in one case as in the other; in other words, it must be equally long in the prints as in the slide *as seen on the screen*. This meant that the scale must actually be higher in the slide itself, because it was viewed by transmitted light, and because the image was enlarged very considerably when projected on the screen. The loss of light being extremely great, the scale of tones must therefore be considerably higher. Judging from his own experience, he had no doubt that most photographers had missed the principal point in this branch of photography. They were under the wrong impression that absolutely clear high lights were an important factor, but such was not the case. The highest lights on the slide should be absolutely clear glass, but they would not show as absolutely white on the screen. The very highest lights, such as represented in the slide by clear glass, should be very sparingly used. It was the enormous expanses of clear skies and superabundance of high lights that had brought discredit on lantern slides. Next in importance were what he would call secondary lights, which are the highest, though *not the very* highest lights in a slide; for instance, a white-washed building, which should not be represented by bare glass, but should show detail. The half-tones were extremely essential in all pictures, whether slides or prints; the detail should be plentiful, and the light moderate, neither too high nor too low. If there was too much light, the *tout-ensemble* would be hard, while, if the half-tones were two low, the picture would be flat. Special attention should be paid to the shadows, as they formed a most important part of the slide. They should be so transparent that all the detail in them should be visible on the screen to a very considerable extent. If an absolutely clear light on the screen was dangerous, great opacity in the shadows was much more so. It was a fact that not sufficient attention was generally given to the general tone of a lantern slide. For his own part, he believed that warm tones were the most desirable; in fact, a perfect slide should, besides the points above referred to, be of a warm, a decidedly warm colour. The tone obtained on a wet-collodion slide toned with platinum was pleasing, but it became wearisome. Cold tones, such as those produced by the ferrous-oxalate developer, were good for scientific subjects, but for artistic work they were very undesirable. He really believed that a large number of cold-toned slides in a lecture produced a cold and fatigued effect on the spectators. Barring toning processes, there was a great danger of over-exposure and fog when attempting to obtain warm tones by development, and increased exposure. This was especially the case with gelatine. Mr. Pringle said that there were two kinds of slides which he would qualify as intolerable: one of them was of the black-and-white sort, such as a snow scene in midsummer, a variety often met with; and the other, which was quite as painful to see, was the result of over-exposure. The lecturer then mentioned the leading characteristics of the various processes most in vogue for lantern-slide work. Beginning with the *wet-collodion process*, he said that the high lights and the half-tones were very good, and the shadows fairly transparent, though liable to too much opacity. If developed rapidly and thin, the results could be modified to a great extent by subsequent intensification. It also possessed the advantage of toning. Some Scotch photographers toned their wet-collodion slides with gold, and, though it was said that slides so toned would not be permanent, he knew that permanency was quite possible if the toning was properly carried out. With regard to the *dry collodion* or *collodio-bromide* process, he was of opinion that it would almost equal wet collodion in the matter of producing transparent shadows and clear high lights. Warm tones could be produced with great ease, and, the exposure being a short one for contact work, and not too long for reduction, he considered this the second best process. The very finest results were obtained by the *albumen process*, but, being exceedingly slow, it was only suitable for contact work. He thought a brief outline might prove interesting to the members. The glass plate was cleaned thoroughly well, and carefully coated with iodised collodion. It was then coated with albumen. The albumen should not be whipped up, and it must be iodised. When in a limpid condition, its hould be poured over the collodion film for about a minute or so. It was then allowed to dry, and here was one of the difficulties of the process, for it was absolutely essential to avoid dust while the plates were drying. The plate is then sensitised in a strongly acid silver bath. The average exposure would be, by contact, about thirty seconds to diffused daylight. The acid pyro developer was the best, and it was preferable to use and to keep it hot during development. The plate was toned and fixed simultaneously in the sel d'or bath. Toning was a great advantage, as any desired tone could be obtained. The *gelatino-chloride* process, although it had produced some remarkably fine slides in the hands of Mr. Cowan, he believed was not the best process for lantern slides. He referred principally to rapid chloride emulsions, in which his own experience was that there was a danger of introducing serious defects in the results. For all-round work, and provided the proper brand of plate was chosen, the *gelatino-bromide* process was the best of all processes. The results were almost, if not quite, equal to those obtained by the other processes, warm tones could be easily got without necessity of fogging, and there was no difficulty in getting good half-tones. He recommended a slow emulsion, and he deprecated one containing a mixture of bromide and chloride or an organic salt of silver. Workers of gelatine plates seldom used a clearing bath, but the lecturer considered that this was a great mistake; in fact, he strongly advocated its use, not only on account of the plate itself, but also on account of the water used in development, which generally left a deposit on the plate. A saturated solution of alum acidified with hydrochloric acid was the bath he would recommend. Although varnishing the slide was not an absolute necessity, still he thought it was an advantage not to be overlooked; the shadows were rendered more transparent, as by altering the molecular surface of the gelatine the varnish allowed the light to go through better. The more nearly the image approaches the appearance of a stain, the nearer will the slide be getting to perfection. Mr. Henderson's argentic stain—which was an emulsion containing an organic salt of silver—had this quality. It printed right out, and could be toned to any desired colour, but sometimes it was difficult to obtain density by this process. As to light for contact work, Mr. Pringle said that magnesium was better than daylight, especially for chloride plates. The lecturer then handed round some specimen slides on albumen and collodion showing some of the points he had alluded to. A member asked the formula for the acid clearing bath. Mr. Pringle replied that he used the following one: Saturated solution of alum, 20 ounces; hydrochloric acid, 2 drachms. The CHAIRMAN said that Mr. Pringle had so thoroughly discussed the matter that he had left him little to say. He agreed with all of Mr. Pringle's remarks, but he thought that, to an experienced eye, a collodio-bromide possessed a quality and a sparkle that were seldom met with in a gelatine plate. Taking it all round, he inclined to think that collodio-bromide was the easiest and the best process for lantern work. Gelatine plates had the great drawback that the colour of the slide very often changed on drying, and he had even noticed a change take place some months after the slide had been made. With regard to the clearing bath, he warned the members that, though very useful, it was liable to spoil a good slide if it was not used with great care. An acid bath containing iron was very good for some slides, as it not only cleared the plate, but would improve the colour of the image. If the plate were left in it for too long, the image would be too much reduced, and the tone too cold. A very hearty vote of thanks to Mr. Pringle terminated the proceedings.

West Kent Amateur Photographic Society.—November 25, Mr. A. R. Dresser in the chair.—It was proposed and carried that the fortnightly meetings be held on Thursday instead of Friday. Mr. C. H. Hastings placed a silver and bronze medal at the disposal of the Judges for competition at the annual Exhibition, January 12, 1892. Mr. GREGOR GRANT read a paper on *Multiple Coated Plates: their History, Use, and Treatment*, in which he followed the various experiments which led up to the invention of the Sandell plate, and those which have been made to test it, showing specimens of the

results of various exposures and the action of the double film in rendering heavy contrasts of light and shade and preventing halation; also some showing the plate's great capacity for standing abnormal over-exposure. Mr. Grant held that, though for ordinary work, where the correct exposure is known, and in cases of great contrast and for interior work, where halation is to be feared, the Sandell plate carries out all that is claimed for it by makers, viz., abolition of halation, capability of rendering great contrasts, and capacity for standing an almost indefinite exposure. Mr. Grant concluded his paper by touching on a modification of the Sandell plate for spectrum photography.

Devon and Cornwall Camera Club.—November 28, the President (Colonel Barrington Baker) in the chair.—The Indian and Colonial set of lantern slides, circulated under the Photographic Society of Great Britain's affiliation scheme, was exhibited. In addition to the above set, several members exhibited, and some very good work was shown on the screen. At the next meeting the subject will be *Developing and Developers*, and demonstrations are being arranged to exhibit the properties of pyro, hydroquinone, eikonogen, rodinal, and amidol. It is also hoped that the series of slides entitled, *Places to be Visited by the Photographic Convention of* 1893" will then be ready, and be exhibited prior to being sent on its travels among the societies. As is probably well known, Plymouth has been selected as the locality for next year's Convention, and the Devon and Cornwall Camera Club, as the issuers of the invitation, hope to secure the co-operation of the townspeople, and of all the clubs in the locality, to the extent at least of a large accession of members to the Convention.

Liverpool Amateur Photographic Association.—November 24, the President (Mr. W. Tomkinson) in the chair.—He referred in feeling terms to the loss the Society had sustained in the death of Mr. J. Noakes, one of the well-known workers of large-size pictures. The SECRETARY read a short paper contributed by Mr. Whitefield, of Manchester, upon his experiments with coloured gelatine for lantern purposes. The paper contained most useful information, which was highly appreciated by those present. Mr. J. SIBETT BROWN then gave a lecture, entitled *A Glimpse of Rome in* 1892, illustrated by upwards of 120 slides made from negatives taken by him in the spring of this year.

Glasgow High School Photographic Society.—November 28, Mr. McCall (President) in the chair.—The subject of the evening was a lantern exhibition by Mr. W. Weir, Secretary. He showed a series of slides, all taken by Shews' hand camera. They embraced Clyde steamers, seascapes, animals, &c.

Hobart (Tasmania) Photographic, Science, and Art Association.—The seventy-fifth meeting of this Association took place at the Museum on October 14. Mr. ROBERT HENRY delivered a lecture on the *Old Collodion Days of Photography*. The lecturer gave practical illustrations in working the "wet-plate process," and exhibited all the apparatus necessary for producing pictures in the old way. Mr. Henry's experience dated back some thirty years, so that he could speak very feelingly of the obstacles which were constantly encountered in picture-making by photography in those early days of the art. Among the apparatus exhibited, a camera made entirely by the lecturer was a capital piece of work, and a beautifully constructed changing box, formerly the property of Bishop Nixon, formed an item for considerable comment.

Cape Town Photographic Club.—Annual Meeting.—The report was as follows:—The number of members at the commencement of the present year was 38. The number of new members admitted during the year is 29, leaving a present total membership of 64. The cash-book of the Club shows as follows:—Balance brought forward from last year, 3*l.* 16*s.* 11*d.*; receipts for the year, 22*l.* 3*s.* 3*d.*; total, 26*l.* 0*s.* 2*d.* Expenditure, 25*l.* 1*s.* 5*d.*, leaving cash in hand, 18*s.* 9*d.* The monthly meetings have been of a most enjoyable character, and have been well attended. The number of the members and visitors present at those meetings amounts to 203, giving an average attendance of 17 persons. On December 15, 1891, Captain Hayes gave an exhibition of lantern slides of animal life, and at this meeting Mrs. Hayes was elected the first honorary lady member. On February 25 last Dr. GILL, the President, gave a most instructive and popular account of recent advances in stellar photography, accompanied with limelight views at the Young Men's Christian Association Rooms. During the past year the following places have been visited by the Club:—Simon's Town, Plattekloip, Groot Constantia, Wynberg (twice), face of Table Mountain, Military Road, Sea Point, and Newlands, and the following subjects have been introduced and discussed at the ordinary meetings:—*Intensification*, introduced by Mr. Wright; *Negatives by Different Developing Agents*, by Mr. Martin; *Mounting of Albumen and Bromide Prints*, by Mr. Wignall; *Reduction*, by Mr. C. Ray Woods; *Enlarging on Bromide Paper*, by Mr. E. Steer; *Isochromatic Plates*, by Mr. R. Pett; *Flashlight Photography*, by Mr. Wignall. At nearly every meeting a large number of lantern slides of views taken by the members have been exhibited, many of them showing great merit. The following were elected as officers for the ensuing year:—*President*: Dr. David Gill, Astronomer Royal (Cape).—*Committee*: Messrs. E. J. Steer, J. R. Wignall, C. Ray Woods, G. van Bonde, R. T. Pett, T. W. Cairncross, D. C. Andrew, and F. Ayres.—*Hon. Secretary*: Mr. A. J. Fuller. A vote of thanks was passed to the retiring Secretary, Mr. G. C. van Bonde, for his services during the past year.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 21,137.—"An Improved Mount for Photographs, Pictures, and the like." G. C. J. JELPKE.—*Dated November* 21, 1892.

No. 21,183.—"A New Form of Photographic Camera." A. R. WORMALD.—*Dated November* 22, 1892.

No. 21,212.—"Improvements in Picture and Photograph Mounts." A. JONES, jun.—*Dated November* 22, 1892.

No. 21,442.—"Improvements in Toning Photographic Prints and Negatives. F. ILES."—*Dated November* 24, 1892.

No. 21,446.—"Improvements in Sliding Carriers for Magic Lanterns or the like." F. L. PERKEN, E. T. PEEKEN, and A. RAYMENT.—*Dated November* 24, 1892.

No. 21,481.—"Improvements in Binders or in Combined Binders and Masks for Lantern Slides." G. J. SERSHALL.—*Dated November* 25, 1892.

No. 21,571.—"Improvements in Photographic Cameras and Stands.' H. VAN DER WEYDE.—*Dated November* 25, 1892.

No. 21,622.—"A New or Improved Paste for the Prevention of Discolouration of Photographs Mounted upon Bristol-board." H. W. VOGEL and J. WEINBERG.—*Dated November* 26, 1892.

PATENTS COMPLETED.

IMPROVEMENTS IN PHOTOGRAPHIC CAMERAS.

No. 716. JOHN TAINTON PRIDE, 179, Markhouse-villas, Markhouse-road, Walthamstow, Essex.—*October* 15, 1892.

MY invention relates mainly to photographic hand cameras, and has for its object, first, to provide a bellows body which is capable of being readily extended or collapsed, and which is entirely self-supporting when in the extended position. To this end the invention consists in making the body to fold but once in its length, and so arranging the lines upon which it is folded that the four sides fold inwards towards the centre and meet, or nearly so, when in the folded position. For this purpose two opposite sides (say the top and bottom) fold inwardly upon a transverse crease at the middle of their length, whilst the other two sides fold inwardly along diagonal creases extending from each corner to, or nearly to, a common centre. These sides also have transverse creases corresponding to, and folding with, those of the first-mentioned sides. Instead, however, of all these creases converging to a common centre, it is preferred, to avoid fatigue of the material at this point, that they should connect with a crease surrounding a central uncreased portion of square or other form.

When the bellows body is extended, its four sides are flat and sufficiently rigid to maintain the body in its extended position. In order to collapse it, it is only necessary to slightly press inwards at the folds the transversely folded sides, whereupon the diagonally folded sides commence to assume a concave pyramidal form at same time that by the continued folding of the other two sides the whole body is collapsed and folded upon itself. To permit of this being readily done, the leather body is stiffened with paper or other material in the usual way with lines of weakness where the creases are to come, and a small light-tight air valve or door is provided in the camera front to permit the ready ingress or escape of the air.

The invention relates secondly to the means whereby a number of plates brought in succession to focal position for exposure may be removed therefrom after exposure, and it consists in the combination with two boxes or compartments placed side by side, and destined to contain the plates respectively before and after exposure, of means whereby the plate which has been exposed may be slid through an aperture connecting the two boxes into the other box, thus making way for the next succeeding plate to be brought forward to focal position by a spring behind, whilst the plate so transferred is, by a combination of springs in the second box, caused to assume such a position as to admit of the next plate to be transferred coming in front of it.

The plates are encased in metal sheaths, so that their sensitised surfaces are protected, and the means by which the plates are tranferred from one box to another consist of a bar fitted to slide across the exposure aperture and to bear against the edge of the plate to be transferred, said bar being attached to a longitudinally sliding bar working light-tight in a slot in the frame and provided with an eternal finger-piece for working it by.

The provision whereby the plates are permitted to come in front of one another in the second or receiving box consists of convexly bowed springs, against which the rims of the sheath bear, and by which the plate is forced backwards in the box at same time that it is rocked upon the bowed surface of the springs by the unbalanced pressure or another spring at the back of the plate, so as to readily give admission to the next plate to be transferred.

A sliding shutter is provided at front, and the back of the double box is closed by a rebated lid locked by suitable clamps to give access to the chambers for inserting and removing the plates.

IMPROVEMENTS IN AND RELATING TO CHANGING BOXES FOR PHOTOGRAPHIC CAMERAS.

No. 15,447. AUGUST STEGEMANN, 151 Oranienstrasse, Berlin, S., Germany.—*October* 15, 1892.

MY invention relates to a changing box for photographic cameras, which is arranged in combination with a case designed for depositing the exposed plates. After every photographic exposure, this depositing case is fixed to one side of the changing box. In the adjoining walls are two slots ordinarily closed by slides, so that the exposed plate, when the two slides are in the proper position, can slide from the changing box to the depositing case. The slide may be actuated either by hand through the medium of a special mechanism or automatically. In order that the sliding of the plate may take place after uncovering the slots, the mechanisms provided on the two receptacles, when the latter are put together, set free the foremost exposed plate and separate it from the others, so that it can drop into the depositing case. The two receptacles are in this instance so close together that, during the sliding movement, no rays of light can fall upon the plates. If, then, the depositing case is removed from the box, after the slots have been closed again by the slides, the next plate is automatically put in the proper position in the box for the fresh exposure.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

THE SENSITIVENESS OF PLATES.

To the EDITOR.

SIR,—May we ask you to be good enough to insert in your next issue the enclosed correspondence regarding an advertisement which has appeared in your JOURNAL? The correspondence speaks for itself.—We are, yours, &c., F. HURTER & V. C. DRIFFIELD.

Appleton, Widnes, November 26, 1892.

[*Copy.*]

Appleton, Widnes, Nov. 15, 1892.

DEAR SIRS,—Our attention has been called to your advertisement in last week's photographic journals, in which you state that your plates have a speed of 100 upon our scale.

We must ask you to kindly inform us upon what ground this statement is based.

Yours truly,
(Signed) F. HURTER & V. C. DRIFFIELD.

To Messrs. The Imperial Dry Plate Company, Limited.

Cricklewood, London, N.W., Nov. 17, 1892.

DEAR SIRS,—Referring to your letter of the 15th inst., we shall esteem it a favour if you will kindly let us know if we are wrong in estimating the ratio between the "Watkins" scale and yours as 3 is to 2, a ratio we believe to be generally accepted as correct.

We are, Dear Sirs,
Yours faithfully,
THE IMPERIAL DRY PLATE COMPANY, LIMITED,
(Signed) T. E. H. BULLEN, *Secretary.*

To Messrs. Hurter & Driffield.

Appleton, Widnes, Nov. 18, 1892.

DEAR SIRS,—We are obliged for yours of the 17th inst., which confirms the conclusion to which we had arrived, that the speed 100 you quoted as the speed of your plates upon our scale was a pure inference based upon Mr. Watkins' estimation.

Whatever connexion Mr. Watkins may have stated to exist between his speed and our own has never in any way been acknowledged by us, nor have we ever given a thought to the subject, for the simple reason that Mr. Watkins has no system of speed determination beyond that open to every photographer, namely, camera test. We cannot, therefore, for one moment admit his speed as a basis upon which to estimate ours. Our own method of speed determination is the outcome of years of laborious investigation, especially undertaken with a view of superseding camera tests. It is based upon actual measurements of the work done by the light, and is provided with a scientific nomenclature and system of units.

From what we have said, we think you will allow that we are justified in objecting to plate-makers using our names at all, unless they actually adopt our system. Such a course is clearly calculated to mislead the public, who naturally infer, when the speed quoted is associated with our names, that it has been ascertained by our methods.

Should you at any time care to adopt our method yourselves, you may count upon our cordial assistance, and we trust you will regard what we have said in the friendly spirit in which it is offered. We do not for a moment imply that your plates may not reach a speed of 100 upon our scale, but it is in the highest degree improbable that this figure accurately represents their speed.

We should like, with your permission, to publish this correspondence, including any reply to this letter you may care to favour us with, as we think it may prevent misunderstanding in the future, and that it is only fair to those makers who have adopted our system to take this course.

Yours truly,
(Signed) F. HURTER & V. C. DRIFFIELD.

To Messrs. The Imperial Dry Plate Company, Limited.

Cricklewood, London, N.W., Nov. 21, 1892.

DEAR SIRS,—In reply to your letter of the 18th inst., we have somewhat anticipated your reply, having withdrawn your names from our advertisements, it being far from our desire to have a controversy with you or prejudice you in any way.

You are, however, doubtless aware that plates are now in the market branded with a certain number on your scale, and "EQUAL TO —— ON WATKINS'." Statements to the same effect can be found in photographic literature every week, comparisons being made, as one would between Fahrenheit and Réaumur or Celsius.

We cannot, therefore, see that the publication of the correspondence that has passed between us would help to solve the question whether 150 Watkins is equal to 100 Hurter & Driffield.

Should you decide to publish our letters, we should probably let the manufacturers, who are pledged to one or *both* systems, discuss the matter.

We are, Dear Sirs,
Yours faithfully,
THE IMPERIAL DRY PLATE COMPANY, LIMITED,
(Signed) T. E. H. BULLEN, *Secretary.*

To Messrs. Hurter & Driffield.

Appleton, Widnes, Nov. 24, 1892.

DEAR SIRS,—From your letter of the 21st inst., we gather that you have failed to understand the position we have taken up.

We have no objection whatever to plate-makers who have adopted our system deducing the Watkins' speed from ours, but we do object to our speed being inferred from Mr. Watkins'.

Our object in publishing this correspondence has nothing whatever to do with deciding what relationship exists between Mr. Watkins' plate number and our speed, but simply arises from a desire to do justice to those plate-makers who have taken up our method, and who are earnestly striving to carry it out impartially and thoroughly.

Furthermore, in the interests of the photographic public, we consider that any quotation of our speed should be based upon an actual determination, and not upon an inference.

In conclusion, we again ask you to accept the assurance of our goodwill, and we remain,

Yours truly,
(Signed) F. HURTER & V. C. DRIFFIELD.

To Messrs. The Imperial Dry Plate Company, Limited.

MESSRS. HURTER & DRIFFIELD'S PAMPHLET.

To the EDITOR.

SIR,—In consequence of an alleged paragraph in your JOURNAL stating that this Society supplies copies of Messrs. Hurter & Driffield's pamphlet on the testing of the sensitiveness of dry plates, I am receiving applications for the pamphlet from several quarters.

It will save disappointment if you will inform your readers that the above statement was made under a misapprehension, and that the Society of Chemical Industry possesses no copies whatever of Messrs. Hurter & Driffield's papers save those inserted in its own journal, which is not on sale to the public, but is reserved for its own members and yearly subscribers.—I am, yours, &c., CHARLES G. CRESSWELL.

Society of Chemical Industry, Palace Chambers, 9. Bridge-street, Westminster, S.W., London, November 25, 1892.

RE MOUNTING AND BURNISHING GELATINO-CHLORIDE PRINTS.

To the EDITOR.

SIR,—As your correspondent pointed out a fortnight ago, little or nothing has been said about the means to be adopted for pressing wet gelatino-chloride prints into contact with the mounts. Ordinary blotting-paper is unsuitable as it leaves the fluff behind, but there is a blotting-paper, manufactured, I believe, in Manchester, that is "just the thing;" as you will see from the piece enclosed, it is a hard, close-grained paper, without fluff, and quite smooth on one side.

For professional use, gelatino-chloride paper should be treated in precisely the same way as albumenised paper. The separate toning and fixing baths should be used, no matter what the brand of paper, and an alum bath should be used after toning and before fixing, the prints, of course, getting a short washing between the different baths; final washing should be confined to two hours.

Prints on this paper burnish far better than albumenised; they take a beautiful gloss, but, instructions to the contrary notwithstanding, they should be lubricated by rubbing them with a little Castile soap dissolved in methylated spirit, *especially when using a bar burnisher.* If enamelled prints are required do not squeegee them on to hare glass, except you want to become prematurely grey; if the plates are collodionised, everything goes on castors, and the prints are protected from damp or dirty fingers, &c.—I am, yours, &c., T. FITZGIBBON FORDE.

Fallowfield, Manchester, November 18, 1892.

P.S.—When mounting have a piece of damp sponge at hand to remove dust, starch, &c. Tongues off, please.

DENSITY IN COLLODION EMULSION PLATES.

To the EDITOR.

SIR,—Allow me to thank Mr. W. B. Bolton for his kind and exhaustive reply to my queries respecting the above; it is most interesting, and I am sure will be appreciated by many other readers of your invaluable JOURNAL besides myself.

The point certainly opens up, to me, a new light on collodio-bromide emulsion making, that referring to withholding part of the bromised collodion, and sensitising the remainder with the full quantity of silver. There are one or two other remarks in Mr. Bolton's reply I should like to refer to with your kind permission. First, with regard to bromising, I may say that I have kept the bromised collodion three weeks *before* sensitising, but I have always maintained an excess of bromide up to the period of washing, allowing sometimes two or three weeks to ripen before washing; in all cases I have dried the pellicle *bone dry*, on account of the danger Mr. Bolton refers to. With regard to the bromide, I usually add the dry double salt to the collodion, but do not get all to dissolve; this is caused, I believe, by crystals of the salts becoming encased, as it were, in a skin of collodion, but I find, as Mr. Bolton says, it is easily dissolved in alcohol alone. And this plan I shall adopt in future, together with the hint to sensitise half of the bromised collodion first, and then to add the remainder. I have not hitherto adopted this plan, as I was always under the impression that, for emulsion of the highest

quality for transparencies, the silver should *never, at any time*, be the slightest in excess.—I am, yours, &c., J. R. G.

Mytton Hall, Shrewsbury.

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—At the present time we have on the books of the Employment Bureau connected with the Benevolent, the names of many assistants for whom we see little probability of finding work this winter. We have one or two wet-plate men who do well in the summer time, who are hard working and economical, but who cannot tide over the whole of the winter. These, and some other men who are printers, would be glad to accept almost any situation in which they could earn a living. Some of them would take places as packers, light porters, &c. At present there seems to be very few vacancies for assistants, though we could find a first-class position for a thoroughly good wet-plate lantern slide maker. On the books we have a considerable variety of almost all classes of general assistants. In one or two cases of men for whom we have found outdoor employment, where we could not obtain them indoor work at their proper branches, the poor fellows are in need of good boots and weather-proof overcoats, which their reduced circumstances and small salaries in their temporary positions hardly enable them to purchase. If any of your readers have "cast offs" in these two lines I should be glad to have a post-card offering them. I would rather not have the things sent on at once, because, in some such cases, the contributions come to hand in greater quantities than the need requires, and it would be a pity for us to accumulate clothing which is needed for other charities.—I am, yours, &c., H. SNOWDEN WARD, *Hon. Secretary.*

Memorial Hall, E.C.

Exchange Column.

* *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Gent's diamond ring, cost 7*l.*, for a lens by good maker.—Address 107 Lake-road, Portsmouth.

Wanted, rolling machine, cabinet size; will exchange burnisher, nine-inch roller.—Address, J. DAY, Photographer, Hendon.

Will exchange 8×7 feet exterior background, on rollers, for four-inch double condenser.—Address, G. MOORE, Backfastleigh, Devon.

I will exchange a cabinet burnisher, new, for a studio curtain or a retouching desk.—Address, JOS GOTHARD, Photographer, Heckmondwike.

I will exchange a fireplace accessory and ½-plate landscape lens for interior or graduated background.—Address FRED. C. D. HURD, Shepton Mallett.

I will exchange guitar, in case, for embossing press, cabinets and *cartes* for enamelling.—Address, L. H. GRANT, 2, Bowdley-street, Clapton-park, London, N.E.

Lerebours full-plate and Dergy's quarter-plate lenses, in exchange for cabinet lens by good maker.—Address, J. ARTHUR, 65, Dale-street, Batley Carr, Yorkshire.

Wanted, Ross or Dallmeyer's 3 a portrait lens; will exchange Seavey's backgroonds and accessories to value.—Address, HERBERT WATKIN, Grand Studio, Scarborough.

Will exchange 8½×6½ rapid rectilinear by Sands & Hunter for 8½×6½ wide-angle or mid-angle rapid rectilinear.—Address, J. AVERY, 45, Prince of Wales'-road, Kentish Town, N.W.

Wanted, 5×5 Optimus euryscope lens, with Iris diaphragm, in exchange for 5×4 quick-acting portrait lens by Ross.—Address, WILLIAMSON EMSLEY, Whitelands, Rawdon, near Leeds.

Will exchange quarter-plate portrait lens, with rack and pinion, or Grimston shutter full size, for four of Bennett's dark slides, whole-plate size. Address, H. JACKSON, l'photographer, Fishguard.

Will exchange Hember pattern pneumatic safety, balls all over, condition as new, cost 19*l.* 19*s.*, for whole-plate set and cash.—Address, H. G. DORRETT, 132, St. John's-hill, Wandsworth, London, S.W.

Will exchange "Harrison's" head and body rest and baleony in four pieces for quarter-plate detective camera (Facile preferred), or whole-plate camera, three double dark slides.—Address, T. R. ALLANSON, Esplanade Studio, Bridlington Quay.

Wanted, a Lancaster half-plate Instanto in exchange for any of the following:—Stereoscopic camera, with five double slides, and a pair of Dallmeyer lenses; Archimedean studio stand; or a forty-feet hydrogen cylinder.—Address, L. DIXON, Market-street, Colne.

Will exchange new 12×12 Vever's burnisher, Ross's 10×10 mahogany camera, Marion's flywheel *carte-de-visite* embosser, for posing-chair with movableiacks and universal balustrade, or flower-stand.—Address, J. HORTON, Central Studio, Caroline-street, Cardiff.

Exchange McKellen's Treble Patent Camera, 22×19, three double slides, turntable and tripod, never used, cost 40*l.*, for complete stereoscopic outfit, large burnisher, or other photographic apparatus up to value, about 20*l.*—Address, J. PICKLES, Engineers, Hebden Bridge.

Wanted, hand camera, quarter-plate or 3¼×3¼, rapid rectilinear quarter-plate lens, or condenser for enlarging, nine or ten inches diameter; exchange for a quarter-plate camera and three double backs, Ross' half-plate wide-angle rectilinear, Grubb half-plate view lens.—Address, J. MARTIN, Southwold, Suffolk.

WEST LONDON PHOTOGRAPHIC SOCIETY.—December 6, Technical Social Meeting.

PHOTOGRAPHIC CLUB.—December 7, *Retouching*, by Mr. Redmond Barrett. 14, Members' Open Night.

WOOLWICH PHOTOGRAPHIC SOCIETY (St. John's School, Wellington-street).—December 8, *Printing-out Paper*, Mr. J. Howson.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION. — December 8, Members' Open Night. 15, Monthly Lantern Night.

PUTNEY PHOTOGRAPHIC SOCIETY.—December 5, Mr. A. R. Dresser on *Work with a Hand Camera*. Lecture illustrated by lantern slides.

ALDENHAM INSTITUTE CAMERA CLUB.—Tuesday, December 6, continuation of lecture by Mr. A. Hair, *The Human Eye as a Camera Obscura*.

CROYDON CAMERA CLUB.—December 5, *The Glycerine-oxalate Development of Platinotypes, and Platinotype Printing by Artificial Light*, Mr. W. H. Smith. 19, Lantern Night (members' slides).

RACK-WORK LENSES FOR HAND CAMERAS.—Of course, the application of rack work to a lens is coeval with lenses themselves; but Messrs. Taylor, Taylor, & Hobson are about to make, if they are not now actually making, a speciality of such lenses for hand-camera work. These contain in themselves the focussing gear, the focussing scale, and the iris diaphragm. This will, doubtless, prove very convenient in many cases.

ON Thursday evening last, the 24th inst., the workpeople employed at Mr. Eddison's various branches, viz., Leeds, Sheffield, Barnsley, and Castleford, held their fourth annual dinner and social evening at the Co-operative Hall, Barnsley. Mr. Eddison presided, and over fifty of the *employés*, with several of their friends, were present. At the close of the dinner the usual toasts were proposed to the host and hostess, &c.

THE BENEVOLENT.—A meeting of the Committee of the Photographers' Benevolent Association was held on November 24, Mr. A. Mackie in the chair. Four applications for relief were on the agenda. The thanks of the Association were unanimously accorded to the Photographic Society of Great Britain and Mr. Frederick Hollyer for their generous contributions to the funds. The Secretary reported that an application for advice and legal assistance had been received in a case of alleged illegal discharge. He had put the matter in the hands of Mr. Tabrum, who had promised to advise and to take such other steps as should seem necessary. Dr. Lindsay Johnson and Mr. Frederick Hollyer were elected Life Governors of the Association, as some small acknowledgment of the assistance they had recently rendered to it.

PHOTOGRAPHY IN AUSTRALIA.—A correspondent writes: "I had hoped to have been able to give a good account of the progress photography had made since I left the colony some six years ago. Unfortunately, however, a most remarkable depression has fallen on the entire Australasian group, brought about by a reaction after the collapse of the great land boom and violent speculations into which everybody seems to have been more or less drawn. The result is that the greatest distrust now exists, business is paralysed, and ruin is everywhere. When I tell you that seventeen millions of money, savings of the people, are locked up in financial institutions that may take ten or twelve years to liquidate, you can easily imagine the want of go apparent everywhere. It is quite impossible to say how long this state of things will continue, but we all hope that with a big harvest, and good wool season, things will soon take a turn. On return, I found our photographic society all but dead. Its funds were in an institution that had closed its doors, and it was next to impossible to collect subscriptions. After some twelve months, during which time scarcely a meeting was held, a few of us are endeavouring to resuscitate it, and, by lowering the subscription from one pound to five shillings, we hope to meet the times, and again have a good membership roll. Since I left I find much competition has gone on in trade, prices are lower, and almost every novelty is now obtainable; in fact, it is unnecessary to bring stocks of plates, films, &c. Photo-mechanical processes are well forward, many newspapers using various processes in illustrating. A firm of printers in business at Ballarat (a large goldfield town) turn out some splendid work for advertising media, book illustration, and the like. The professional portrait saloons, although turning out, if anything, better work than usual, are very dull of business, and prices have consequently suffered."

Answers to Correspondents.

R. D.—See editorial article in this present number.

BELLA.—The albumen paper has been tinted with an unsuitable dye.

HERBERT.—Some of the Edinburgh lamps fulfil the conditions required.

C. C. W.—We have forwarded your query on to the writer of the article.

W. K. BURTON (Tokio).—Received. Many thanks. The matter will now be closed.

W. VICK.—The details of Mr. Van der Weyde's photo-corrector have not been published.

G. E. HADDEY.—You will find the subject of photogravure spoken of at some length in our forthcoming ALMANAC.

E. HERBERT.—One light of from 5000 to 6000 candle-power would suffice, with a couple of reflectors, one of them being utilised to soften the shadows.

T. B. CLIFTON.—One of the best preventives of blisters on albumen prints we have tried is that of Mr. Richmond, namely, to immerse the prints after printing, before they are wetted, in methylated spirit, then wash, tone, and fix in the ordinary way.

TYRO.—Judging by the definition of the three specimens, you have evidently obtained an excellent lens. The focus is quite suitable for a half-plate. The shutter may be placed either in front of or behind the lens. It is purely a matter of convenience.

E. G. M. asks: "Would you kindly inform me what gum is used with the black or Indian ink for finishing bromide enlargements, that is, for glazing and deepening the shadows, and stippling the background?"—A solution of gum arabic is what is used for the purpose.

T. WALDEN.—We are always willing to oblige our readers, but must draw the line somewhere. We cannot undertake to analyse mounts to see if they contain matters that might act perniciously on silver prints. To do this completely is a matter of hours, sometimes even days.

STUDIO.—With that width of studio, we should recommend fourteen feet of glass at the top and sides, as it will then be more convenient for taking large groups when required. The glass might also be continued one foot lower at the sides with advantage—that is, if we understand the sketch rightly.

B. A. (Cambs.).—If a portrait lens of the Petzval form will not give a sharp image on the screen at any part, unless it is stopped down to *f*-16, it must be a very defective instrument. It should give perfect definition over a good portion of the field with its full aperture. Are the glasses properly arranged?

G. P. S.—It is not to be wondered at that the inspection of the group pains the eyes of those who examine it in the stereoscope. If you look at it again (it is returned as requested), you will find, although it is mounted so squarely, the two halves are so trimmed as to cause the figures on the left-hand picture to occupy a level higher than the right-hand side by nearly a quarter of an inch. By retrimming them all will be right.

R. W. (Newcastle) puts the following query: "I have some photographs which have been stained with salt water (sea water), which has caused red markings upon them. Can you tell me how I can remove the stains without injuring the prints?"—It is doubtful if the stains are removable without injury to the prints, or without knowing what has caused the stain in addition to the sea water, as we suspect that alone has not done the mischief.

C. SHULTZ (Frankfort).—We can scarcely advise you in the matter. We can, however, tell you that there are a very large number of skilled operators, as well as retouchers, out of employment in this country at the present time, and doubtless they, unfortunately, will be for some months to come. Professional portraitists here attach very little importance to technical class diplomas; they prefer practical proof of competency in the studio.

COLLODION.—I. Edge the plates with a solution of indiarubber. 2. We are at a loss to account for your failure in getting sufficient density with the acid pyro and silver intensifier. We have never such a failure ourselves. 3. Give a full exposure, and use a well-restrained developer. Probably the veil of which you complain would disappear if the picture were varnished with an ordinary spirit varnish. 4. Such an emulsion should keep well for several months.

S. V. W. says: "I shall be obliged by your telling me how I can make some ozone bleach, which is not now a trade article. It is, I believe, a hypochlorite, but I am no chemist, and do not know of what, nor how to proceed to make it, although I have understood that it is easy to make."—It was probably a sodium hypochlorite, of the preparation of which we have been unable to obtain details. Perhaps some reader may be able to supply the desired information.

F. C. Green, of Chihuahua, Mexico, writes: "Will some of the readers of your Correspondence Column better versed in chemistry than I am kindly explain, if the theory of Captain Abney and of other authorities, that the action of light on Ag Br is to reduce it to a lower order, setting bromine free, is correct, why, on volumetrically testing the purity of a bromide by means of Ag NO_3, the result is not higher when the operation is conducted by daylight than in a dark room? Can the nascent bromine not decompose the Ag NO_3?"

AMATEUR writes: "I have built a studio in my garden thirteen feet long. Will you please tell me of a cheap lens that will take full-length cabinet portraits in it that will be free from distortion? The only lens that I have that will take a full-length picture in the studio is a wide-angle one, and with it the perspective is far too violent."—No lens will do what is required in that length of studio. The best plan will be either to lengthen the studio or make such alteration as will permit of the camera being placed outside the room when full-length pictures are desired.

S. A. S. says: "Nearly two years ago I was compelled to pledge a valuable lens. A short time ago I went to redeem it, and I was told that it was sold by auction in the ordinary course, and probably it was sold, under these conditions, under its value. Have I any redress?"—No, except that you can demand to see the pawnbroker's books, and, if the instrument realised more than the amount it was pledged for, with the interest and expenses of sale, the excess will be your property. If, on the other hand, it did not realise that amount, you are indebted to the pawnbroker for the deficit.

A. W. says: "I had a Daguerreotype brought to me to copy, but it was covered with a brown stain which rendered it impossible to get a good copy from it. Having read that Daguerreotypes could be cleaned, I immersed it in diluted nitric acid, and it has removed the brown stain, but the image is gone too. Can it be restored? and, if nitric acid is not the right thing to use, what is?"—The Daguerreotype is now past restoration. If, instead of treating the picture with nitric acid, a dilute solution of cyanide of potassium had been employed, it might have been restored to its pristine condition.

INQUIRER writes: "Can you tell me whether the stains on the enclosed photograph are owing to imperfect washing of the print or to impurity of the mount? The photograph was mounted with freshly made starch. I have had a large number go like this, and cannot fathom the reason."—The prints show unmistakable evidence of fading, but whether this is due to imperfect washing, insufficient fixing, or faulty mounts, it is impossible to say by a mere ocular inspection. To ascertain if the mounts were at fault, a chemical examination of them would have to be made, and this our time will not permit us to make. The mounts had better be sent to an analytical chemist for examination and report. If that says the mounts are pure, the cause of the fading must be due to the manipulations.

G. MOORE writes: "I am often now puzzled to know why my print washings won't precipitate. I keep a large, wide-mouth jar that holds about two gallons, and when full, add hydrochloric acid. This time, however, it won't settle, although I have used both acid and salt (sod. chl.). Could you suggest anything? I fancy I have observed a greater reluctance in the settlement of the silver chloride since I began the use of gelatino-chloride paper, as, if I recollect rightly, the albumen paper washings settled readily."—With the treatment mentioned, the chloride ought to settle down. We know that sometimes it does not do so readily with ready-sensitised paper. Often, if the whole is stirred up violently two or three times during a day, it will quickly subside. Exposure to light also favours subsidence.

ANXIETY.—Both technically and artistically the photograph is excellent. Respecting the spots, the mount seems all right, and we would not hastily feel inclined to blame it until after a prolonged comparison between some that were mounted and others left unmounted. We know of a similar instance in which the photographer ran such spots to earth, and eventually found that they were directly traceable to the employment of a particular sample of hyposulphite of soda, upon changing which the spots never again troubled him. Should this not prove a remedy in your hands, then test the mounts by pressing a moist print, face down, upon a dry mount, previously interposing a slip of pure white paper to isolate a portion of the figure from the mount. After a few days strip them asunder and note what change, if any, has taken place.

ELECTRIC writes: "Can you give me any information as to the probable cost of introducing electric light into my studio for taking portraits? I don't mean to make the electricity myself, I can get that from the electric lighting company. Will you tell me what appliances are required and the probable cost? and also are the appliances cumbersome, or will they be in the way when using ordinary daylight? My studio is small, and I have not much room to spare. I enclose a plan of my studio, so you will see what room I have to spare."—By applying to the electric lighting company they will give an estimate for what is required. All that is necessary is an arc light of from five to six thousand candle power, and a reflector such as has so often been described. The whole affair is by no means cumbersome, and can well be fitted in a studio of the form and dimensions shown in the sketch.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—Meeting of delegates, November 26, Mr. W. Bedford in the chair.—The report of the Committee on Technical Lectures was read, to the effect that Photogravure seemed the most suitable subject. The members of the Committee stated that they had approached the Photographic Society of Great Britain, who had given them a favourable reply, and that they were in communication with a probable lecturer. The report was adopted. To carry the proposed lectures into effect it was proposed by Mr. Cox (North Middlesex Photographic Society), seconded by Mr. Clifton (Photographic Club), and carried, that a committee, to consist of Messrs. Everitt, Hodsoll, and Marchant, be appointed to elect a lecturer and to report upon the best method of carrying out the scheme. A letter from the Southsea Photographic Society was read suggesting, 1, a means of circulating for fixed periods the more expensive works of reference on photography amongst the Societies; 2, That albums should be collected and circulated illustrative of the best work of the various Societies; 3, That sets of slides should invariably be accompanied by readings. With reference to the first proposal, which was that the Committee should subscribe to some library where the works were to be found, it was pointed out that no such lending library existed that the delegates present were aware of, and that the formation of a circulating library would be impossible in the present state of the funds at their disposal. The second suggestion, on the proposal of the Chairman (Photographic Society of Great Britain), was adopted in the form of an invitation to the various Societies to form albums illustrative of various printing methods, &c., which it was thought would prove of considerable interest. The Secretary was instructed to communicate in the above matters to the Societies affiliated, and to draw their attention to the desirability of reading matter being supplied with the slides for circulation.

FORTHCOMING EXHIBITIONS.

1893.	
February 18.....	Holborn Camera Club. Hon. Secretary, F. J. Cobb, 100 High Holborn, E.C.
March 1, 2	*Fillebrook Athenæum Photographic Society. Hon. Secretary, Joseph W. Spurgeon, 1 Drayton Villas, Leytonstone, Essex.
April 17-29	*Photographic Society of Philadelphia. Hon. Secretary, R. S. Redfield, 1601, Callowhill-street, Philadelphia, U.S.A.

* Signifies that there are open classes.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1701. Vol. XXXIX.—DECEMBER 9, 1892.

MAGNIFYING GLASSES FOR RETOUCHERS.

Retouchers who are shortsighted in even the slightest degree are able to practise their art without having to invoke any lenticular aid. But men of this class are in a minority, most retouchers preferring to make use of a magnifying glass for enabling them to work effectively upon the fine details in a portrait photograph.

One retoucher informed us that he always made use of a single magnifying lens of four inches diameter, which was attached to his retouching desk by an adjustable arm. The focus was eight inches, and the lens was thick, heavy, and cumbrous. We tried to convince him that precisely the same magnifying effect could be obtained by employing a pair of spectacles, the lenses in which were of the same focus as his large reading glass. This he promised to try, as the convenience would be great in comparison with the heavy lens spoken of.

After some time he reported that he had tried the glasses recommended, and had failed with them. When looking through any one of them he said he could not perceive any difference in magnifying power between it and the four-inch reading glass, but when both eyes were employed a great difference was immediately appreciated. With the large magnifier, the eyes rested insensibly upon the part of the negative desired to be examined, and this was altogether unaccompanied by any straining, while with the two smaller glasses the coalescence of vision on one part was only obtainable by a considerable ocular effort accompanied by a slight pain induced by such effort. The cause of, and remedy for, this difficulty we shall now point out.

When both eyes are directed each through the centres of similar lenses, if the foci of these be long, then will an object at a reasonable distance, say, from twelve inches upwards, be visible without any muscular effort; but, in proportion as the foci of the pair of lenses become shortened, so does the difficulty of seeing increase, until, at a very short focus, one cannot see an object with both eyes at all. True, by either eye it will be seen quite distinctly, and magnified to a more or less considerable extent, but by no muscular effort can both eyes be used simultaneously. This is the case when the centres of the lenses are directly opposite the centres of the eyes.

Let the lenses now be decentred, by any mechanical means, so as to bring their centres a little closer together than the width of the eyes, and all straining in order to see distinctly is obviated, vision becomes distinct with both eyes, and through the spectacles becomes identical with that through the large magnifier—so far, at any rate, as concerns its application to the requirements of the retoucher.

For here is what takes place. In the large lens, and by virtue of its dimensions, neither of the eyes can be directed through its centre, but must necessarily be opposite a portion near the margin, and which forms a prism that bends the rays from the eyes towards the axis at the other side. Hence the facility with which a central object can be examined by a large lens. Now, when the glasses of the spectacles are decentred in the manner spoken of, they are placed in a position precisely analogous to the single large magnifier—that is to say, the eyes are directed not through their axes or centres, but through a portion much nearer their margins, and hence forming prisms by which the rays are deflected. It is indeed precisely the converse position of eyepieces for the stereoscope, in which the conditions to be fulfilled are of an entirely opposite nature.

The adoption of the system here suggested will, we believe, prove convenient and useful to retouchers, especially those who from necessity or choice make use of magnifiers having a considerable degree of power.

RECENT EXHIBITIONS AND THEIR LESSONS.

The last three months have been a glorious time for the photographic pot-hunter, no less than nine exhibitions with open classes having provided him with the means of indulging in a variation of the pastime associated with the name of the metaphorical and mysterious individual, Tom Tiddler. There has, of course, been the usual up-and-down element in the distinctions conferred in various places and by various Judges upon peregrinatory exhibits; the customary flood of disgust and disappointment of dissatisfied competitors has also broken loose, while in some cases it is feared features of a decidedly objectionable nature have been associated with more than one of the exhibitions. It is, in short, useless to affect ignorance of the fact that widespread discontent prevails among exhibiting photographers and the photographic public with the management of exhibitions, the curious contrariety of opinions expressed by different Judges, the uncertainties of Judges powers, the absurdities and injustices they are the means of imposing; and with what is called the "medal system" and exhibition matters generally.

If the high-handed proceeding of the Judges at the Tunbridge Wells Exhibition, in withholding awards wholesale, has done nothing else, it has at least compelled an attention to the subject of photographic exhibitions, which should not be relaxed until some common agreement has been arrived at on many points of critical interest.

The desire on the part of the individual for a permanent expression of his success in competition with his fellows is such a deeply rooted trait of human nature that it is as idle to dis-

cuss the question of abolishing medals at photographic exhibitions as it is to cast ridicule on the Prix de Rome, the Royal Society medals, or even military medals. Honour, in nineteen cases out of twenty, is valueless unless symbolised in the concrete, and a bare recognition of this unmistakable truth is sufficient to put to silence any objection to medals and other awards at photographic exhibitions. For we take leave to say that, without such public competition, exhibitions of photographs would be difficult, if not impossible, to maintain; and, since it is highly probable that progress in technical and artistic photography largely relies for recognition and encouragement upon the opportunities for expression and publicity which those exhibitions afford, it not unnaturally follows that photography itself would not inconceivably suffer by the suppression of the competitive element in exhibitions.

Admitting this much, several questions of vital interest inevitably thrust themselves into notice. The first one is, Who shall be the judges of relative merit at photographic exhibitions? The answer, according to most of those who promote these exhibitions, would appears to be, Those who have themselves been successful exhibitors. An obvious fallacy, if modern thought and practice be accepted as a guide, underlies the theory here implied. Art critics are not usually painters; dramatic critics are seldom, if ever, playwrights or actors; reviewers do not habitually write books; the occupants of the bench are not advocates. By what train of reasoning, therefore, do photographic society committees so habitually reach the conclusion that successful exhibitors at photographic exhibitions are the most competent to decide upon the merits of the pictures of those against whom they have themselves, and may again, compete? Again, it were vain to pass over the important circumstance, that artistic photography of the present day is in process of evolution into two or more schools, with whom focal treatment, methods of printing, selection and composition are matters of interesting disagreement and controversy. Shall, then, the adherents of the one school be the Judges of the works of the other in competition with those of its own?

If the Judges of photographic exhibitions were drawn from the ranks of those who were not themselves exhibitors, there would be less chance, we submit, of individual idiosyncrasy controlling the disposition of the awards. To what extent, moreover, should Judges have power to fix a standard of merit, or to withhold medals? In our opinion the one should not be placed within their province, while the other should not be permitted them so long as the conditions laid down by the promoting society have been complied with. To place such powers as these without limitations in the hands of Judges who are themselves occasionally competitors is to pave the way for all sorts of grotesque proceedings and equally invidious comments upon them. Where an exhibition is organized under promises to the competitors of the award of a certain number of honours, and the latter are withheld by the Judges on grounds which they themselves set up, the competitors are cheated, the society itself is insulted, and the whole business is covered with ridicule. It is, in fact, promoting an exhibition on very like false pretences.

We have referred to pot-hunting. Merit, wherever it appears, should be recognised; but is it not permissible to utter the sentiment that a man who shows surpassing excellence should not thereby be permitted to sweep the board of all the prizes on offer, but that he should be subjected to certain limitations as to the number of medals he can grasp? Why are champion classes not more generally held? Is it, again, strictly honest on the part of exhibitors to change the titl of their "touring" pictures now and again? Are Judg always given sufficient time and opportunity for arriving their awards? Should technical faults be overlooked, ar artistic excellence alone considered? What powers is it advi able to confer on Judges as to the bestowal or withholding awards? In the latter case, should their reasons not always stated? Should they be expected to enact the *rôles* of criti as well as Judges?

These are only a few among the questions which have bee suggested to us by a study of recent exhibitions, and we pla them here in the desire to afford an opportunity for discussio by those interested. The whole subject of the conduct photographic exhibitions is ripe for thrashing out and settl ment on a basis of common agreement, and we trust that son authoritative action will be taken in providing a standard s of rules for societies, exhibitors, and Judges alike. Could n some member of the Photographic Society of Great Britai move that body to appoint a Committee to deal with it?

BACKGROUNDS.*

In reference to the plan of making the feet of supported frame backgrounds to project on one side only, it has been suggeste to us that, where only two or three are in use, it would b better to have two feet on one side and one on the other, an thus the maximum of stability would be retained, witho there being any danger of the whole falling over in consequen of some untoward push. A couple of grounds would "nest equally well, and one extra framework would not seriousl interfere with the length of the studio. We repeat the hi for what it is worth, appearing, as it does to us, a simple an practical plan.

Treating now upon the actual use of these almost necessar adjuncts, several points arise which have not hitherto bee publicly discussed. First, we have the question of architec tural scenes, interior or exterior. It must have offended th artistic instinct of many photographers to see, as is often th case, sloping perpendiculars—columns emulating Pisa's cel brated Tower, side windows made by errant carpenters, an buildings whose appearance would shock an architect, an many similar eyesores. It need scarcely be said that thi is owing to the inevitable tilt given to the portrait camera i bringing the figure centrally upon the plate. To correct b using the swing-back is to bring the feet of the sitter out c focus, and thus render necessary so small a diaphragm as t seriously interfere with the sitter's comfort. With hangin backgrounds there is no other remedy; but, when these ar stretched on frames, the difficulty is surmounted in th simplest manner. All that is necessary is to tilt the frame work backwards until it is parallel with the camera back; th parallelism of the verticals will then be retained, and there wil be least disturbance of focus.

We have said that this cannot be done with hanging back grounds, and this is true in the strict sense of the words; bu there is here also a remedy, and one which carries certai advantages in its track. Whether the rolling scenes be used singly, or in one of the frameworks we have alluded to, i would be quite possible to interpose a permanent stiffened framework covered with canvas, rendered taut with a coating or two of wall paper, behind the background. This framework could then be tilted, and the scene would take the same angle.

* Concluded from page 754.

The very great advantage that would attend the use of this movable "wall" would be the possibility, where the object represented was an interior or exterior wall or any solid object, of greatly extending the possible range of poses by permitting the sitter to lounge or rest against the protected background. Many extremely natural positions can be attained in this manner which are quite impossible with a loose hanging canvas. No one, we imagine, would be content to take a portrait when the sitter's elbow, for instance, caused an apparent break in the wall. The slightest disarrangement of the perfect flatness of the background would at once destroy all pictorial illusion; the figure would be backed with painted canvas, and not with a sketchy, suggestive scene. It will be scarcely necessary to interpose the remark that this leaning against a stiffened background could only be permissible in the case of solid objects, though it must be admitted that it has not infrequently happened that portraits have been sent out where the figure has cast a shadow on the sky, for instance!

This point leads to another little-understood matter—the position of the background in relation to the light. Many photographers have purchased backgrounds from seeing the dealer's photographs of them, but have been greatly disappointed in not being able to obtain the same effect; however used, the scene comes up darker or lighter than the original represented it. This is entirely owing to combined causes of the angle at which they are placed with regard to the illumination, and the amount of light admitted through the studio windows upon the background itself. A sitter is taken with one of these views behind, and all goes well; another sitter immediately following is photographed with the same surroundings, but when the print is scrutinised the ground is dark, heavy, and unnatural. The reason is simply that the blinds have been altered to suit the requirements of the features of the second sitter, and the light received by the ground has been entirely changed in quantity.

A most valuable quality of the movable frame, whether of rapid frames or sets of hanging views, is the power of placing it at any angle to the light. Especially is the value seen in plain or shaded backgrounds. A sitter is posed; the harmony is complete between the light he receives and that thrown behind. A blind or two is altered to improve the illumination of the features, at once the background becomes too dark or too light. If, however, a framework on castors is in use, all that is necessary to restore the original harmony of *chiaroscuro* is to place it at an angle to the light, move it to face the light a little more, or turn it away from the light, and at once increased lightness or darkness of effect is obtained. It would appear that a theoretically perfect way of lighting the ground would be to have a special walled illuminating slit which would permit its light to fall on the ground and nowhere else, then the exact effect required would be produced; whatever the mode adopted for illuminating the sitter, no shadows would be thrown on the clouds, and complete harmony would result.

Photographic Evidence.—We are informed that a case will shortly be before the Law Courts in which photography, as a witness, will be in evidence on a much larger scale than on any previous occasion.

Royal Portraits.—Some little excitement has been created on the Continent by the sudden disappearance from his home for several days of a young German prince. In England every one is now so familiar with the portraits of the members of our Royal Family, that one is inclined to wonder how any member of a foreign one would not be at once recognised wherever he went—at least, in his own country. On the Continent, particularly in Germany, we are informed, photographs of royal personages are not so common as they are here. Evidently sittings from them are not so easily obtained, or photographers are not so enterprising as they are in this country. There may yet be another reason—royal portraits are not in such great demand abroad as they are in England.

National Photographic Gallery.—The First Commissioner of Works has announced that the Milbank Prison is forthwith to be demolished, and a portion of the space offered for the picture gallery Mr. Tate has so generously offered to build. This offer, it is stated, has been accepted. The announcement has also been made that another portion of the site will be exchanged with the War Office for some land belonging to them behind the National Gallery for the still further extension of that building. Hence a considerably increased space will soon be available for pictures. The present would be an opportune time to bring before the proper authorities the subject we have before mooted, namely, a national collection of photographs—for example, portraits of men, who have distinguished themselves in art, science, literature, or in other connexions during the present age. The collection need not be confined to portraits, as it might well include photographs of ancient buildings in London and other large cities which are continually being demolished to make way for modern improvements. A collection of these and of buildings that have been removed during the last few decades—if negatives are in existence—would not only be of interest to the archæologist of the future but also the present period. If the Photographic Society of Great Britain, in conjunction with other scientific and learned societies, were to take the matter in hand, the thing could now, doubtless, be accomplished. Of the desirability of such a gallery there can be little question.

Carbon Printing.—A considerable proportion of amateurs who have not seen the process worked imagine that a large number of appliances, not found in the den of the ordinary amateur, are necessary for its practice. This idea, in great measure, has been formed from the manuals of the process, in which a long list of articles, with prices of "sets," are given. Very possibly this has had the effect of retarding the progress of carbon printing amongst amateurs. As a matter of fact, the carbon can be worked with less special apparatus than any other process in photography. This subject was particularly dwelt upon at a recent demonstration before one of the suburban societies. We remember being at a demonstration of the carbon process at the Photographic Club some time ago, when the only appliances, beyond the exposed tissue and its final support, were a squeegee and a wash-hand basin borrowed from a neighbouring bedroom. Mr. Cowan and warm water did the rest. All that is necessary in the initial stages for the amateur is a large meat dish, to be requisitioned from the scullery, and a tin or enamelled iron baking dish from the same source: the former for holding the water for mounting the exposed tissue on its support, and for the sensitising bath, if the sensitising be done by the experimentalist, and for the alum bath; the latter for the warm water for developing. In addition to these, a squeegee is required, and, for the beginner, a thermometer is desirable. As extreme accuracy—a degree or two—is not essential, one of the cheapest form will suffice. One more item is necessary, namely, an actinometer. The one preferred by Lambert for his demonstrations consisted of a series of progressive thicknesses of thin bank post paper in a quarter-plate pressure frame, with a piece of sensitive silver paper behind, which any one can make for himself in a few minutes. Hence it will be seen that the most primitive arrangements will suffice to prove the process. That being done, the amateur can then elaborate them to suit his requirements. The progress of processes is often retarded by their exploiters introducing a number of accessories which they supply, and some think necessary, for the work.

A VISIT TO A FAMOUS AMATEUR—HOW MR. HENRY STEVENS WORKS.

In photography, as in other departments of art or applied science, it is the one who devotes himself to one branch who has the highest

chances of success in making for himself a name and fame in a specialistic branch. This is what Mr. H. Stevens has done in the by no means easy one of floral photography. But for his photographs of flowers we would say that he is a good all-round artist in nearly every department. Without claiming to be a landscapist or group photographer, yet have some of these with figure subjects been selected for full-page engravings for the leading illustrated papers; and, while he largely ignores the distinction of being considered a portraitist, yet do many of his portraits possess a very high degree of merit, both in a pictorial and technical sense.

But, as we have hinted, it is in the portrayal of flowers that he is universally acknowledged to stand *facile princeps*. There are some of Flora's treasures much more easy to photograph effectively than others, but those who have in recent exhibitions been privileged to examine Mr. Stevens' productions will at once acquiesce in our statement, that he flies at only the highest game—at things avowedly the most difficult of execution. A white lily, in the hands of most photographers, would have its petals represented in flat chalkiness, without detail; but in those now under notice, while, like the original, pure and white as a whole, there is a waxy, transparent delicacy which reveals the veins and structure of every part of the flower, even to the extent of permitting such structural detail to be examined by a powerful magnifier. As with lilies, so with orchids, even those of the most fantastic shapes and colours, for in these Nature seems to excel herself in regard to both qualities. A singular property is that while photographing these flowers life size or nearly so, and reproducing their tints with such delicacy, Mr. Stevens has not yet made use of colour-corrected plates, but trusts exclusively to obtaining his effects by lighting, supplemented, of course, by correct exposure and judgmatical development.

The studio, which measures probably about eighteen by nine feet, and stands in the garden, has a ridge roof, one of the sides and half of the roof being closely screened—at least it was so at the time of our visit. The huge camera employed occupies much of the floor space. The lens is a large aud somewhat old portrait combination of long focus, and has a stop in front of the anterior combination, although he possesses a large collection of lenses of modern construction. The exposure is made by a pneumatic shutter.

It is in the lighting where the long experience of the artist shows to advantage. His subjects are placed on a table on a raised platform at one end, and, the side lighting having been arranged, there is a further modification of the lighting by the use of an opaque movable screen, which rests upon the eaves and the ridge. The developer preferred for the special brand of plates employed is pyro and soda, and he considers it wise to carry the development considerably farther than would others of less experience. We may adduce as an instance of one of the lovely transparencies which adorn one of the windows of the Camera Club, and which was printed from a negative so dense as to require an exposure of thirty minutes to a good daylight sky, not by superposition, of course, but in a transparency copying camera.

In course of our visit we saw several hundreds of negatives and transparencies—for Mr. Stevens is an indefatigable worker—including those in the late Exhibition in Pall Mall, for which a medal was awarded, and came to the conclusion that the large majority of them possessed merit not inferior to those which excited such admiration in the Exhibition just mentioned.

The developing room is a separate building from the studio, and is erected at some little distance from it. It is of larger extent than the studio, for Mr. Stevens likes to have plenty of room in which to work. This is indeed necessary, for, as we have said, the plates used by him are of large dimensions, and he prefers a very feeble light. He holds the plate in an ebonite dish in his hands during development, and usually rocks it on the edge of a trough just below the gas lantern, which is well covered by paper of a canary medium species. Plenty of time is given so as to coax out every detail. In the course of the development the fluid is poured once or twice, as occasion requires, into a large graduate, to which is then added soda, pyro, or bromide so as to modify its action when returned to the plate.

Outside of the developing room is ranged a row of several washing tanks, with water taps just above each, and all this portion is covered in by a glass roof. A workshop adjoining is also to some considerable extent impressed into the service of photography; but perhaps the most interesting department is an observatory, originally constructed for sidereal observation, and having a rotating dome as a roof. This has now been relegated to enlarging. The telescope has been deposed, and its place given to a camera, which can be directed to any part of the sky. The idea of being enabled to enlarge a large negative by an apparatus which is practically equatorial is calculated to fill one with envy.

It is, however, in the billiard room where the rich store of negatives, prints, and transparencies are hoarded. The billiard table has a strong and readily removable wooden cover, on which the sorting, mounting, and framing are done. How a gentleman so actively engaged in his business avocations in London, as Mr. Stevens is so well known to be, gets through his amateur photographic work unaided (for he does everything with his own hands, and without any assistant) is truly surprising. It can only be accounted for by his being quite an enthusiast, and straining after perfection—the unattainable.

In this connexion we may record an incident. Having gone to Eastbourne with his family for a few weeks' holiday in the summer, he was one night struck with an idea relative to the obtaining a new effect in lighting. Early next morning he took train back to London —or, rather, to Addlestone, his place of residence—and immediately proceeded to test the value of his idea before returning to the seaside. We consider that much of his success is due to this dogged perseverance in straining after perfection, added, of course, to a naturally fine taste and good manipulation.

His large portrait work is marked by softness, not so much obtained by placing the sitter out of focus as by modifying his lighting. We cannot say with precision how large are the heads of such direct portraits, but we may state that, roughly speaking, the faces of several portraits of some young ladies we saw could barely be covered by the partially closed hand of a strongly built man. Neither in his flowers nor in his portraits does he permit of the smallest touch upon the negative to improve it; if it does not come out all right with the developer, it is destroyed without hesitation.

Two conservatories, well stocked with flowers and plants, furnish floral subjects for his camera, while in another part of his grounds stands a closed photographic waggon, replete with everything necessary for storing, changing, and even developing negatives on such occasions in prospect of obtaining skating scenes on lakes at a distance from home, for harvesting, picking up a gipsy encampment, or other scenes not obtainable at home. To secure these, his horse is harnessed, and off he goes to bag the game.

Before terminating our visit, we made the acquaintance of his famous photographic dog and cat, which have figured in many of his pictures. The former, a fox terrier, is trained to throw his arms around his Persian *confrère*, who quietly submits to the caress of the canine until as many exposures as are required have been made.

AMERICAN NOTES AND NEWS.

The Hand Camera and its Abuse.—In a sensible article dealing with the tendency of modern amateurs to produce inferior results by means of the hand camera *Anthony's Bulletin* remarks: "There can be no doubt that the number of users of the hand camera is increasing at an enormous rate. The portability, compactness, and general simplicity of action of the instrument commend it to all. But, of all photographic instruments, it is the one calling for the exercise of judicious self-restraint and careful handling. The user must remember that an instantaneous picture is usually an underexposed one, and that it is practically useless to attempt to photograph a poorly lighted object unless an exposure of one half to one second can be given. The users of tripod cameras seldom expose with the shutter unless forced to do so, and the percentage of results ranks considerably higher than that of those of the hand camera. The users of the latter instrument rarely, indeed, use the time attachments, and therefore must depend on the extreme rapidity of their plates or films, and on the choosing of well-lighted subjects. In most of the cheaper hand cameras the lenses are perforce diaphragmed down so as to give good depth of focus, for the focussing is done chiefly by a graduated scale. The lens will work usually about right

if the light is really good. Under any other circumstances the negative will be poor and weak.

English versus American Cut Films.—Dr. Charles L. Mitchell contributes to the *American Amateur Photographer* an account of his recent photographic experiences in this country, in the course of which he says: "My photographic material consisted of cut celluloid films for the two larger cameras, and glass plates for the hand camera. The films were from a manufacturer whose products had served me fairly well in the trips of the two preceding years. . . . Alas, however, the films were soon found to be exceedingly bad, especially the quick emulsion, but not before much valuable work had been lost. They were scratched, spotty, and full of pinholes, and seemed to lose their image unless developed immediately after exposure. A change was therefore made to English films." Dr. Mitchell soon became convinced, from the change, of the advantages of English over American films, which he attributes to superior skill and care in coating.

"Wilson's Magazine."—Our contemporary will in future appear as a monthly, thus reverting to its former course. Considerable alterations and improvements are promised.

Is the Top Light Essential in Portrait Work?—Mr. J. A. Todd, of San Francisco, raises this question in a communication to *Wilson's Magazine*, and asks that, if a top light can be dispensed with and a side light alone take its place, would not photographers be enabled to occupy a cosy, conveniently accessible ground-floor suite of rooms, put in a large side light in one of the end rooms, and do more business in consequence of the more convenient location?

Photographic Printing by Moonlight.—Dr. John Vansant, of Mobile, Alabama, describes in the *St. Louis and Canadian Photographer* some experiments proving that the light of the moon is capable in a short time of producing a developable impression upon a sensitive silver bromide film. The exposures on commercial films of varying degrees of rapidity ranged from three minutes down to five seconds. The latter exposure to the rays of the full unclouded moon when near the meridian being sufficient to produce a good developable impression upon an uncovered extremely sensitive film, it appeared that the same kind of film when exposed beneath a weak negative required a minute's exposure, Dr. Vansant thus calculating that about ninety-two per cent. of the actinic rays of the moon were intercepted by the glass and gelatine.

Arctic Photography.—*Apropos* of our recent remarks concerning Dr. Nansen's intention of taking a camera with him on his Polar journey, it is interesting to learn that Lieutenant Peary, the Arctic explorer, who with his wife has just returned from the north, had a Kodak with him on his journeyings. Eighty-two degrees was the most northern point reached by Lieutenant and Mrs. Pearey, and is said to mark the farthest limit to which the camera has as yet penetrated. Lieutenant Pearey made over 1300 exposures. The films were developed by a Philadelphian photographer. The Secretary of the American Navy, it is stated, has granted Lieutenant Pearey a further leave of absence to make a second attempt to reach the North Pole.

"Improvement in Photo-zincography."—For transferring photo-litho copies to zinc plates Herr August Albert details, in the *Photographic Times*, the following method:—The copy is printed, developed with fatty ink, and dried as usual. The drawing is afterwards dusted in with a finely pulverised mixture of ten parts of asphaltum and one part of pure beeswax, and all superfluous asphaltum removed by means of a fine camel's-hair brush and a tuft of cotton, and slightly heated over an alcohol lamp to melt the asphaltum together with the fatty ink. The copy is then passed through the saturated alum bath to keep it uniformly moist, laid between sheets of moistened blotting-paper, and finally transferred upon a zinc plate.

FLASH-LIGHT PHOTOGRAPHY.

[Toronto Camera Club.]

THE making of pictures by the aid of the magnesium flash-light has been undergoing a process of evolution for the past five or six years. The journals have contained many papers upon the subject; chapters discussing it are to be found in a large number of manuals; and at least two books dealing entirely with it have already been published. It is no part of my present purpose to sift this extensive literature for you. Instead, I shall content myself with demonstrating certain methods which, having tested, I have found to be at once simple and satisfactory. For the needs of a surgeon these procedures are particularly well suited, and it is to one of my own craft, Dr. Piffard, of New York, that we are all indebted for the introduction here of photography by artificial illumination. In this connexion it is worthy of remark that, for the production of the most accurate and life-like pictures of skin diseases and other morbid conditions, Dr. Piffard prefers artificial to sunlight. He has recently brought out a work illustrated by such photography, and surpassing in many particulars, any previous publication on the subject.

It is within my knowledge that many amateurs who do creditable work out of doors have with magnesium failed to obtain any results which they cared to exhibit to their friends. Deep shadows, hard, chalky high lights, staring eyeballs, burns, dirt, and disappointment have been their reward, instead of the artistic results they had hoped for.

At the risk of going over what is perfectly well known to many, if not most, of those present, let me mention some of the essentials for success in this line of work. The lens, preferably one of the rapid rectilinear type, must not be stopped down below *f*-11; the plates used must be fast ones, such as the Cramer "C" or the Seed 26x; the background must not be too near the sitter or it will show direct shadows, and its tint should be lighter than for use with daylight. The correct focus is most easily and rapidly obtained by the use of a lamp, a newspaper, and a focussing glass. Let the light of the lamp fall upon the newspaper, held upside down, and raised, lowered, or carried out to the sides, in order to determine just what will and what will not come upon the plate. As a general rule, the gas or lamp lights should be turned up, so long as they do not shine into the lens, and they should light up that side of the face which will not be lighted by the flash. In this way its shadows are softened, and hard lines avoided. It is a good plan to have the sitter look directly at one of the gas jets or lamps. He will thus not be so much disturbed by the sudden increase of light when the flash is made, and will not be so apt to have a startled or staring look, or to close his eyes suddenly.

I think the advice often given to place the flash apparatus over the camera, is an error. It is better to have it placed higher than the lens, and to one side or the other of it. An exception to this is seen where a fireside or camp-fire group is to be taken, and the object is to make it appear as though their faces were lighted up only by the fire around which they are placed. Even in photographing a cavity like the back part of the throat, I have found the detail brought out best when the light came from a position slightly to one side of the lens. For diffusing the light, and so obtaining soft instead of hard negatives, a sheet of ground glass is excellent, and a sheet of bright tin makes as good a reflector as need be desired. I have used for more than two years a convenient arrangement, consisting of a piece of board fifteen to twenty inches long by one foot wide, with a plate fixed to the middle of its under surface, so that it may be secured upon any tripod stand. At each end of its upper surface a pair of parallel wooden strips are nailed so as to form slots to support, in upright positions, the tin reflector and the ground-glass diffuser. Between these two the flash-lamp is placed.

After trying a number of the patented articles, I have reached the conclusion that the simple one which I devised, and described in the *Beacon*, gives as good results as any other, and has the advantage of being easily made by any one with skill enough to press a button. A flower-pot saucer has a hole bored through its rim to allow of the passage of the stem of a clay tobacco pipe. The bowl of the pipe is to be fixed upright in the middle of the saucer by means of plaster of Paris. A rubber tube, ending on a mouthpiece, is fitted over the stem of the pipe. Next a wire ring, supported at a height of three or four inches, is placed so as to surround the pipe bowl, and upon this ring asbestos wicking is twisted.

When it is desired to make a flash, from five to twenty grains of pure magnesium powder is to be placed in the bowl, and the wicking is to be saturated with alcohol. Lighting the alcohol, and then blowing through the tube, forces the powder into the long axis of the flame, and perfect combustion takes place. By a number of experiments, I have demonstrated that a sudden strong blast which lifts the

powder in a mass out of the pipe does not give as good result as a gentle one promptly followed by a forcible blowing. This latter method loosens up the powder, and then sends it through the flame in balloon form, giving a maximum of illumination with a minimum of magnesium oxide, falling as a dust cloud after the flash has been made. Asbestos is much better than candle-wick, as it does not burn, gives off no smell, and the flame on it can be easily blown out.

In some particulars the diffusing apparatus above described resembles a patented article sold in the United States; but mine was in use before that came out, and the cost of the entire outfit need not exceed a dollar. Any one can make it, it comes apart for packing, and the results obtained by its use in the hands of my friends, as well as in my own, are not discouraging. DR. N. A. POWELL.

DIPPING-BATH DEVELOPMENT.

[Photographische Rundschau.]

DIPPING-BATH development (*Standentwicklung*), has been in use for three years at the establishment conducted by the writer, where large numbers of negatives have to be produced after methods certain to give good results, for "interiors," having had an exposure of as much as four hours, as well as for plates having had only four seconds, such as "exterior architectural subjects."

The principle of dipping-bath development is found in the prolonged action of a very diluted developer contained in a dipping-bath, which, being provided with grooves, admits the simultaneous treatment of several plates.

The advantages of employing pyrogallic acid for this kind of development are so numerous that all trials with more modern developing agents were abandoned, they not permitting such a high state of dilution and such a certainty of success at such a small cost.

Negatives produced by this method show a very fine grain and a range of gradation, even in the highest lights, which no other method ever will give, making them especially suitable for enlarging on bromide of silver paper.

For ordinary work the formula is as follows:—

1 : 10 solution of soda sulphite	100	parts.
1 : 5 solution of potassium carbonate	100	,,
Water	10,000	,,
Dry pyrogallic acid	2	,,

For instantaneous work—

1 : 10 solution of soda sulphite	100	parts.
1 : 5 solution of potassium carbonate	100	,,
Water	3,000	,,
Dry pyrogallic acid	1½	,,

In this state of dilution pyro also loses its most obnoxious property—staining the fingers and plates—entirely, and gives negatives of a harmony beautiful to behold.

To obtain the very best results, thickly coated plates of a medium rapidity and with no tendency to frill should be employed.

DR. A. MEYDENBAUER.

THE ARBITERS OF HONOUR.

APART from those inevitable exceptions, whose apparent office is to accentuate a truth by demonstrating the small number of dissentients thereto, "the world thinks, and I think so too," that the most precious signet of success is the medal bestowed at what is still, and still likely to be, the most keenly inspected annual Exhibition of the year, viz., that held under the auspices of the Photographic Society of Great Britain, for which reason I doubt not that all who have the present welfare and future advancement of photography at heart will bear with me while, supplementing my former article on p. 741, entitled, "The Plague of Medals," I offer some suggestions specially directed to ensuring that there shall be no depreciation in the value of the aforesaid premium, but that, as time goes by, it may become even more highly valued than at present.

I do not claim that the following proposals are alike perfectly novel and completely perfect, these two qualities being usually incompatible; but I do claim to have given the subject considerable thought, and to have brought to its examination a mind open to consider any alteration calculated to raise the status of the Pall Mall medal.

The first reform which in my estimation seems advisable is the adoption of a far more *rigid* system of recognising and remarking that which is *in excelsis* meritorious on the Exhibition walls. This of necessity implies some modification in the constitution of *the arbiters of honour*. I will, therefore, shortly, state what in my judgment are the lines upon which the bench of Judges should be constituted, leaving it to those in authority to apply that which, being lacking, they nevertheless approve.

The three following points should characterise the Judging Committee:

(1) It should be widely representative and distinctly capable.
(2) It should not include a majority believed to represent any known "community of interest."
(3) It shall include one or more individuals (as may be in due course defined) who are definitely representative of
  (*a*) Artistic culture.
  (*b*) Photographic craft.
  (*c*) Optical, chemical, and general science.
  (*d*) Provincialism.

Respecting the above, little comment is called for, except perhaps as regards section 3, concerning which, it is to be observed, that while the Judges described under *b* and *c* are most unlikely to be unconsciously (or otherwise) partial, having, as hereafter provided, only to deal with points of excellence which are essentially unemotional in their appeals to the critical faculty, the same can by no means be said of those coming under either category *a* or *d*, where the personal element is apt to be decidedly intrusive, and *nolens volens* influence the Judges' decision. For this reason I would advocate that those chosen as representatives of "provincialism," *d*, should be selected from amongst men of *recent* standing, rising men; of such the big, and many of the little, towns collectively contain many a score. As for the representatives of "artistic culture," although no man can be hoped for who does not prefer one form of expression rather than any other, yet a judicious admixture of individuals of different artistic inclinations is not impossible, in any case one or more painter-artists should be included who is neither a member of the society nor known as a photographic practitioner.

From the foregoing it will be readily inferred that the present manner of appointing Judges, which is by a species of general election on the part of members, must be revised. At any time, ruling by quantity instead of by quality is obviously bad; that it is ever resorted to at all is in order that the interests of the multitude may be safeguarded. But of a certitude the intrusion of the vote by ballot into the administration of a society formed for the stimulation of applied science and art is largely anomalous and emphatically undesirable. Even political governments of advanced radical types do not provide a means whereby the electorate regularly meddles with executive functions.

The delicate and complex task of wisely blending the jury of experts should, without doubt, be undertaken by those who are in authority, and should be the outcome of leisurely deliberation and nice discrimination, strictly applied upon such lines as may be laid down. That this be properly and carefully done by the Council, the President for the time being should be held personally responsible, and upon him should rest the ultimate blame if any one manifestly unsuitable be appointed.

And now I come to a detail which may possibly arouse some difference of opinion, but which I think should not, on that account, be passed over. I have gradually formed an opinion that, in the case of a society such as the one we are considering, it should be a *sine quâ non* that on this appointment all Judges shall, as a matter of course, be handed a fixed honorarium for services to be rendered—a kind of retaining fee—in exchange for which they should sign a printed form of acknowledgment, undertaking to attend at the time fixed, and carry out, in accordance with the instructions furnished to them, the duties thereby cast upon them.

It is beyond question that men of sterling worth find few things so valuable to them as their time. Now, although I do not in the first instance advocate any remuneration which is likely to be an equivalent for the hours and energies taken from a busy career (and even amateur photographers have business occupations of one kind or another), I do think that some recompense should be made which will, in the majority of cases at least, ensure that the out-of-pocket and personal expenses of the adjudicators are fully covered.

That penury waits on pre-eminent ability is too notorious to need enlarging upon, and the lack of a few paltry shillings may ofttimes prevent a gifted individual from placing his natural or acquired abilities at the society's disposal. With a powerful and ambitious organization such as is the one in question, the maxim should be, *Do ut des*, and not, "Take all and give nothing," which is nearly all that the Judges get, except, sometimes, the dubious honour of being eventually held up to ridicule for the way in which they have done their work.

Having delivered myself of my suggestions upon getting the right sort of Judges, I should like to add my ideas as to how they are best set to work; circumstances of time and space, however, oblige me to

defer doing so until a future occasion, when I trust to bring forward some proposals on this most vital point which, I venture to hope, may in part, if not altogether, commend themselves to the serious attention of those whom I will term the progressive conservatives of the parent society.

HECTOR MACLEAN, F.G.S.

RECENT SCIENCE AND PHOTOGRAPHY.

(Abstract of the Presidential Address before the Photographic Society of Great Britain.)

WHEN a truly wonderful thing becomes common it ceases to attract interest except to the few. Thus one marvel in science is the action of light on sensitive surfaces. The keen interest which all can take in the development of a plate is nothing to the keener interest which the mind should feel in trying to trace the reason of the phenomenon. Some few years ago we had to familiarise ourselves mentally with atoms and molecules oscillating in an incompressible ether, and in this case "faith was a precious grace," for it was hard to conceive it possible; and now we have to slightly alter our mental picture and conceive that the ether of space is compressible; for comparatively recent considerations have shown that the original mathematical investigations of the motion in the ether which we put as light and which explain all the phenomena met with, no longer require us to consider incompressibility as a necessity. This has freed the way for us to cogitate over possibilities, and to amend our theories of the formation of a photographic image—or rather, perhaps, I should say to prevent them being seriously objected to owing to the non-inclusion of what used to be considered a necessity. So far then mathematical science is opening instead of barring the way for a truer conception of what takes place. Chemistry, too, I need scarcely say, is also helping us forward in the work of molecular physics. Those web-like graphic formulæ which we see pictured in chemical journals have more meaning than at first sight appears; and they would have even still greater meaning if, instead of chains of affinities represented on a plane surface they were represented in space of three dimensions.

The law of, what for simplicity I will call molecular attraction, has been expressed mathematically, and puts before us the possibility of telling what is limit of space in producing photographic action, and I would point out that up to the present time it has been held that if time and intensity of light give a certain chemical change in a body, then the same will be produced if the two multiplied together give the same constant. I think that we must put this law on the same basis as that of gravity, which is that bodies attract one another inversely as the square of the distance between them until we come into distances between the bodies which are to be compared with the diameters of the molecules, when another law must be applied. In the same way when we get intensities of light which are almost infinitely feebler than those with which we are accustomed to deal, the "time-into-intensity" law will be found to break down. This follows almost from physico-mathematical considerations. Quite recently, too, we have had a chemist investigating the action of light on chloride of silver in a more perfect way than has hitherto been attempted; and, if I read aright, we come to the conclusion that the same conditions are necessary in it that are necessary to produce electrical action. Following up in these lines we may get to know more certainly the chemical action which takes place in a photographic plate than we do at present. There has often been one objection made to any chemical theory of photographic action which I have often had to combat, and I can but repeat my argument against the objection, as I conceive that if removed it is one of the stumbling-blocks which prevents progress.

The objection is this: that such a large part of the spectrum is active on a photographic plate. Our conceptions of photographic action are that the wave of light shall beat time with the oscillation of the atom in the molecule of the sensitive salt, and increase the swing of the atom, eventually causing it to quit its parent molecule and join itself to some adjacent one. If this be the case, it has been argued that the salt of silver should only be sensitive to one ray of light, since that oscillation of only one set of waves should be able to effect it. Here mechanics help us. A pendulum will be increased in swing even though the intervals of time of the outside impulses given to it do not exactly coincide with the time of oscillation of the pendulum. The swing of the pendulum will be increased by every set of impulses to a certain degree, and will then diminish the swing, bring the pendulum to rest, and start it once more on its travels. That is to say, at one period the amplitude will be increased by once its ordinary swing. So with the atom in the molecule, any series of waves which will increase the distance of the atom from the centre of attraction, even by the smallest quantity, may increase it so much that the attraction to that centre is less than to another, and the atom may thus swing off, and the stoppage of the swing by the further ill-timed vibrations of the ether will be effective. If we took the doctrine of averages, which is so useful in molecular physics, this could not be the case, since the average amplitude of the atom would approach to that of the normal swing, except where the wave motion and the atom motion were in actual harmony. The same reasoning applies to the absorption by the sensitive salt, which, if it alone could be effected by a ray of a single colour or wave length, would only show that absorption. I may remark that the same line of argument applies to the three-colour sensations in the eye. That the latter are due to the same cause may be shown by comparing the curves of sensitiveness of a sensitive salt and those of the colour sensations. They will be found to be essentially the same in character and general shape.

There can be but little doubt that the sensations of colour are as truly photographic as the effect on a sensitive plate, and I would here remind you that a photographic action is as truly present when the exposure given is short as when so prolonged as to become visible. A photograph on the retina may be invisible if it be examined for any change; but the chemical action may be equally well transmitted to sensatory nerves. Colour fatigue is probably due to a printing-out action, whilst a negative image in the eye, after fatigue, may be attributed to the same causes which give a reversal to the photographic image on a plate. The difference between a sensitive plate and the sensitive retina may alone consist in the fact that in the one the receiving sensitive compound is a motionless solid, in the other that it is a moving liquid, constantly changing and being renewed. In establishing any theory, due regard must be paid to temperature. Heating a body means increasing the motion of the component molecules, whilst chemical action means increasing the motion of the atoms. The molecule will not necessarily suffer any change by heat except that of increased motion, and will revert to its original state when the heat is withdrawn, whilst the atom's motion may so increase as to cause a chemical change, which is likely to be a permanent change of state. When the molecules are further apart it is evident that the atoms have most scope for movement, whilst when the molecules are very close together their motion must be decreased. The last is exemplified in extreme cold, and Professor Dewar has shown that even at the temperature of liquid oxygen (−200° C.), bromide of silver is sensitive to light. From this fact he has concluded that the change in the salt is more physical than chemical. For my part, I do not see it in that sense, and the sensitiveness of the salt at normal temperature and at this extreme cold will have to be measured before any real conclusion can be drawn.

Little by little science is enlightening us as to the dimensions and distance apart of molecules, experiments are explained by mathematical investigation, and, in almost shapeless outlines of ideas, details are gradually being filled in, and the picture to the mind begins to assume beauties in design which at first could not be dreamt of. Photography is essentially a branch of molecular physics, and thus we are gradually able to approach a knowledge which is not altogether vague. Ideas get simplified as the mind gets enlarged, and analogues in nature help us in thinking out our theories. A theory conceived and proved, after all, is but removing a cause a step further back; it is leaving another milestone on the way behind us. How many more there are to pass we know not. Theories are but the silken threads which may guide us through a labyrinth, and when we extract ourselves from it we find the maze we have left but the entry into another. Yet this need not cause disappointment or despair. Each difficulty conquered leads us nearer to the prime cause, and let us remember that the infinite is only reached by the finite, and it is but a few months ago that Lord Kelvin, who has long been a peer in science, demonstrated a fallacy in a mathematical law.

CAPTAIN W. DE W. ABNEY, F.R.S., C.B.

EXHIBITIONS AND JUDGES.

THE paragraph in the JOURNAL *re* the Judges' awards at Tunbridge Wells is well timed, and likely to revive the perennial discussion on the matter of judging and exhibitions generally. It is a pity we cannot once and for all settle this vexed question by the establishment of a central controlling body, formulate a set of rules which would meet the views of the majority of exhibitors, and put a stop to such fiascos as that at the town named.

Looking at the mighty strides made by photography during the last ten years—advances not merely commercial but artistic—we must give the lion's share of the credit for this result to the numerous exhibitions which have been held. Some of the competitions have been open to much criticism, but on the whole the rivalry has been

healthy and devoid of bitterness. Much comment has been made re the superfluity of awards in certain quarters, but this error—which is rendered of less direful effect by the ridicule of the Press—is small in comparison with the effect likely to result from action such as that of the Judges at Tunbridge Wells. It will be a thousand pities if such action be allowed to curtail in any way either the number of exhibitions or exhibitors. Every one connected with photography (with the sole exception of the unfortunate Secretary) benefits by these exhibitions, and personally I think it would be better to let the silver and bronze tokens be scattered abroad even more liberally than hitherto than to lessen by one print (and this is a large order) the numbers at our exhibitions.

The award, after all, of medals and applause does little harm; it is kindly intended, it is often a great incentive, and has but one occasional and regrettable effect, when, given not wisely but too well, it induces the recipient to imagine henceforth that photography is his Heaven-sent gift, and, in short, impels him to join the ranks of an already overcrowded profession—a profession, by the way, for which he is, as a rule, by no means well fitted. This is the one ill effect, I think, of indiscriminate awards, but, so far as it concerns the Judges, the fault is but a pleasant one. In the selection of Judges, the committees appear to all adopt one course—they glance through a list of names, gentlemen of good repute, all of them; the majority have received scores of medals for a certain class of work, others have identified themselves with various fads, and become apostles and high priests of sundry accidental creeds, all of which unfits them for judicial functions. Sometimes, indeed, we shall find, but *rarely*, the man with this accumulation of awards becomingly modest—doubtful of himself. At times he may say, "Yes, I've been rather lucky; they seem to like my work, though I'm not *quite* satisfied with it myself." But as a rule he doesn't; he is quite prepared to uphold his own work as the alpha and omega of all photography, and to sit upon all comers. The faddist, of course, because he *is* a faddist, should never be chosen; such men can see no beauty—nothing to applaud beyond their own narrow circle.

I have a plan to propose which would necessitate some concerted action on the part of societies; but, as some of the latter are affiliated to the Photographic Society of Great Britain, this preliminary would be overcome. It is, for the societies to select and appoint a Judge; this gentleman to be a photographer of known ability, conversant with all recognised processes, of liberal, not to say broad, mind, as regards opinions; one who, admiring the man of "studies," could still appreciate pure landscape or a bit of architecture; who could sympathise with, and encourage the aspiring locals, and generally give an unbiassed opinion. Such a man could be met with, undoubtedly. He should be paid a fee over and above expenses, and would be expected to provide a report to be published and issued to the competitors, setting out his opinions of the pictures shown, giving praise and blame in due proportion, pointing out the beauties of certain work, and the defects in others. This, in many local exhibitions, would be invaluable. Such a Judge, being *au courant* with most of the work already shown, would be able to spot at once the over-exhibited work, and might be relied on not to be "bluffed." *Criticism* is what exhibitors appreciate; not to be told in as many words that "we have fixed a very high standard of excellence, and anything short of this will not be considered."

The Society to which I had for some years the pleasure and honour of acting as Secretary used to have, and, I think, does so still, occasional shows confined to members' work. I would advocate annual functions of this kind. Initiate the younger members into the mysteries of exhibition work amongst themselves, and then, in course of time, they are better prepared to compete in the open classes. They come to see gradually that a standard of excellence is necessary to deserve a place on the walls, and the rest is then better understood.

I doubt whether "presentation prints" are popularised so much as they might be. A capital method of educating our younger members and others who have seldom the opportunity of visiting the chief exhibitions would be for the Central Controlling Body to make a collection of such good examples of photography as they could get the permission of the owners to utilise, have them reproduced in collotype or some such process, supplying them to the Societies at a reasonable rate for distribution to the members. I remember the Society to which I have referred in one year paid for a presentation print—one print, by the way—a sum of about two shillings. I believe it was about that sum. It must be obvious that the combined members of some one hundred and fifty societies could receive a very handsome collection of views for that amount each. The educational value would undoubtedly be enormous.

But all this means concerted action, and that is a state of things likely to be reached, if it ever is reached, very slowly. So far as I can see the Photographic Society of Great Britain is the only body at present in the condition, on account of years and standing, to take fully into consideration the question.

J. PIKE.

ON THE METHOD OF EXAMINATION OF PHOTOGRAPHIC LENSES AT THE KEW OBSERVATORY.*

14. *Distortion. Deflection or sag in the image of a straight line which, if there were no distortion, would run from corner to corner along the longest side of a ——— by ———plate = 0· ——— inch.*

The following is the method adopted at Kew of measuring the distortion produced in the image by the lens under examination. Let fig. 14 be a vertical section through the testing camera; GG representing the ground glass; F the principal focus; and N_1 the horizontal axis, which passes through the nodal point of emergence, the adjustment for that purpose having already been made for test No. 10. The lens-holder carrying the lens is first turned in either direction through an angle β, such that PF, or FN_1 tan. β, or f tan. β is equal to half the *shortest* side of the plate for which the lens is being tested. (The *horizontal* movement of the swinging beam in the testing camera gives an easy means of determining the angle β; a distant object is first brought to focus at the centre of the ground glass, and then the swinging beam is revolved about

FIG. 14.

the axis A (see fig. No. 1) until the image has moved along the graduated scale a distance equal to half the shortest side of the plate; the beam is thus made to move through the angle β, which can be read off with sufficient accuracy on BC, the top of the wooden stool, which is graduated for that purpose). After this adjustment has been made, the ground glass is brought into focus by observing the image of a distant object at a point P, a little below C, the line engraved on the glass; under these circumstances, if the principal focal surface is a plane, and if the lens were being used in the ordinary manner, PP' would be the position occupied by the photographic plate, the section shown being taken across the centre of the plate parallel to its shortest side. The small distance PC is carefully measured; this length is then multiplied by secant β, thus obtaining C'P, which we will call a. The swinging beam is now revolved about the pivot in either direction, so that the image moves along the scale on the ground glass a distance equal to half the *longest* side of the plate for which the lens is being examined; the sketch in fig. 7 is still more or less applicable, PP' still representing a section across where the photographic plate ought to be, but this time at the end of the plate, not at its centre (F, therefore, no longer represents the principal focus); in fact, what has been done is to make the image describe what, neglecting distortion, would be a straight line from the centre to the corner along the longest edge of the plate: after this movement has been made, the length of C'P is again obtained by

* Continued from page 776.

measurement and calculation, and this time let the result be called *b* the operation is repeated when the swinging beam is revolved to an equal angle on the other side of zero, and a third length, *c*, is thus obtained. In fig. 15, let BAC be equal in length to the longest side of the plate, and let *a*, *b*, and c be the lengths just obtained; then the curve *bac* will evidently represent the image of a straight line thrown by the

Fig. 15.

lens under examination along the edge of the longest side of the plate. Since the image travels along a line very nearly parallel to the engraved line on the ground glass, BAC will be nearly parallel to the chord of the curve, and $\frac{b+c}{2} - a$, which is the length recorded in the Kew certificate, will be a very close approximation to the sagitta or sag of the curve.

The image of a rectangle near the limits of a photographic plate will appear, when any distortion is visible, like one or other of the forms indicated in fig. 16. The sagitta is conventionally considered positive if it is measured towards the centre of the plate from the chord, thus giving the name of positive and negative distortion in the two cases.

The distortion for distant objects is not necessarily exactly the same as for nearer ones, and therefore the uses for which the lens is intended should not be forgotten; for example, with portrait lenses an object some

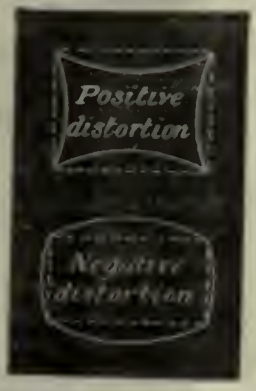


Fig. 16.

ten to twenty feet away should be used to throw the image in the above test.

Probably it will not at once be admitted that this is the best means of measuring distortion; for no doubt it might be done in many other ways, and a method might easily have been selected which would have been less open to criticism on purely scientific grounds. We believe, however, the Kew certificate gives the information really required in practice. In order to determine if a lens is suitable for any particular purpose, all that is required to be known is whether the image of a straight line near the edge of the plate will show too much curvature, the amount of tolerance depending greatly on the work for which the lens is to be used. There is no means of enabling the photographer to form a judgment on this point more readily than by giving him the sagitta or sag in the image of a straight line along the edge of his plate. That it would be difficult to find a better method may, perhaps, be made more evident with the aid of figs. 17 and 18, the former representing a section through a lens and the photographic plate, and the latter showing part of the plate in plan, with the curved image of a straight line just inside its margin. In fig. 17 let N_1 be the nodal point of emergence; $S\beta$ the centre of similitude for rays emanating from a distant object and making an angle β with the axis; and S_β the same for an object at an angle θ; *e* and *g* will, therefore, be the images of these two objects as seen on the plate, whereas, if there had been no distortion, they would have appeared at *f* and *h* respectively; *ef* and *gh* will, therefore, be the total distortion in each case. In fig. 18, let the rays coming from the objects, of which the images are seen at *e* and *g*, make the angles β and θ with the axis of the lens at the nodal point; if *ef* and *eg* are equal in length to the lines similarly denoted in fig. 17, it is evident that the curve *ege* represents the image of a straight line, which, if there had been no distortion, would have appeared as the

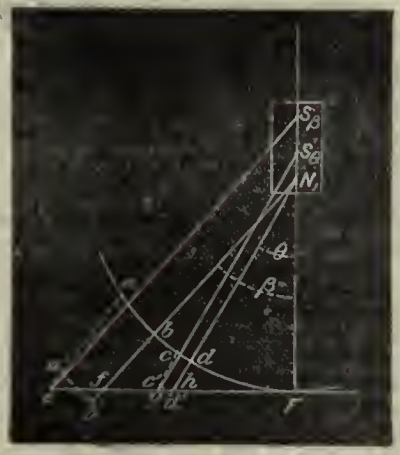


Fig. 17.

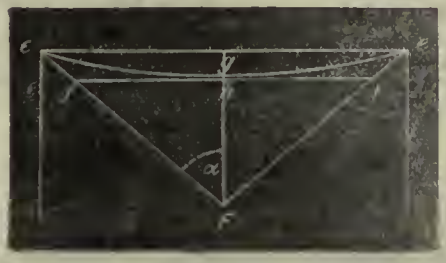


Fig. 18.

line *fhf*. Now, it would not have been difficult to have devised means of measuring the total distortion at any part of the plate; for instance, to have measured the distortion *ef* for the point *e* at the corner of the plate —but the following considerations show, it is thought, that that would not be a suitable way of testing the lens; let the curve *efe* in fig. 18 represent the greatest curvature that would be tolerated for the class of work for which the lens is intended; compare the lens producing this curve with another in which $S\beta$ occupies the same position, but in which $S\beta$ is nearer the nodal point N_1: *ef* would be the same in the two cases, but *gh* would be less in the second case, and the curvature would therefore exceed the tolerated limit; with two lenses giving an equal total distortion at the margin, one should be passed and the other rejected. The total distortion at any one point will not therefore give a measure by which the lens should be judged, the greatest rate of change in the distortion more nearly representing what is required to be known; and, as the rate of change is certain to be greatest at the margin, the Kew certificate supplies the information required.

The tourniquet has already been mentioned as an apparatus which has been specially recommended for the purpose of testing photographic lenses; by means of this invention, Commandant Moëssard obtains an excellent means of detecting distortion, but hardly of measuring it in a way to indicate the curvature produced in an image. It will be remembered that the lenses can be revolved about an axis which passes through the nodal point N_1, whilst the eyepiece remains stationary; the effect of this movement can be seen in fig. 17 by imagining the lens to be stationary, whilst the object and the eyepiece revolve about the nodal point, the arc *abcd*F being the path traversed by the eyepiece. Let *a* be the image of the object after the lens has been revolved through an angle β, and *e* the position where the image would be seen on the photographic plate; for there is no reason to believe that the line *ea* will coincide exactly with the line $eS\beta$; if there were no distortion, *b* would be the image as seen in the tourniquet, and the distance moved by the image from *b* to *a* is what is measured by that apparatus. It will be noted that the image *a* will be much out of focus if the lens has a fairly flat field, and that, after re-focussing, *a'* will represent the image, and *b'* the point from which the measurement is taken; this re-focussing will tend to reduce any error which may be due to *ae* not being coincident with $eS\beta$,

but such a movement in the middle of an operation is rather objection able on mechanical grounds, Putting this objection aside, it will be seen that we do not get a ready means of finding the curvature produced in the image as seen in plan in fig. 18; for, if $c'd'$ is the length measured by the tourniquet when the lens is revolved through an angle θ, then the sagitta of the curve is equal to

$$a'b' \text{ sec. } \beta \text{ cos. } a - c'd' \text{ sec. } \theta.$$

15. *Achromatism. After Focussing in the Centre of the Field in White Light, the Movement necessary to bring the Plate into Focus in Blue Light (dominant wave-length* 4420), = 0·—— *inch. Ditto in Red Light (dominant wave-length* 6250), = 0·—— *inch.*

The photographer may be said always to adjust his focus in daylight, and if the actinic rays are not brought to the same focus as the dominant rays for white light, the definition obtained in the photograph itself cannot be perfect. In fig. 19, let $u'wu'$ be the position of the photographic plate, the focus of which has just been adjusted in daylight; if the lens has not been properly corrected for achromatism, the different coloured rays will form different cones, and those coming to a focus at w will have a wave-length of about 5570, for that, I am informed by Captain Abney, is generally speaking, the dominant wave-length for white light. Let $b'bb'$ be the cone of rays of 4420 wave-length, which is not far from the position of the maximum actinic effect for dry ordinary bromide plates, and let $u'uu'$ be the cone for rays of 4000 wave-length; since the actinic effect with silver salts begins to fall off rapidly at about 4000 wave-length, the cones outside the cone $u'uu'$ may be neglected, and it may be taken that the image of a point covers a disc on the photographic plate of which $u'w$ is the radius. It is evident that what the photographer wants to know, with regard to the achromatism of his lens, is the amount of diffusion caused in the image by any errors in its construction, that is to say, what

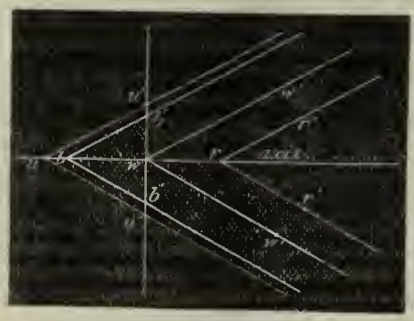


Fig. 19.

is the actual size of the disc of diameter $u'w$.

The examination for achromatism is, therefore, made in the following manner:—First the focus is carefully adjust in daylight on a suitable object placed as far away as possible in the room, and then the focus scale is read off. After this, a sheet of blue glass, the colour of which has a dominant wave-length of 4420, is placed behind the object and close in front of a small opening in the shutter, through which all the light enters the room; the focus is readjusted, the focus scale read off again, and the difference in reading to that observed in white light is noted; the length bw in fig. 19 is thus obtained. Now let f be the principal focal length of the lens; and let f' be the focal distance when the observation was made, which can be obtained with sufficient accuracy by a direct measurement from the ground glass to the nodal point of emergence, or to the pivot which has been made to pass through that point. The difference of focus bw, noted between the blue and white light, is then multiplied by f/f', and the result thus obtained is that finally recorded in the Certificate of Examination as if it were the direct result of an observation made on a distant object. Exactly the same process is then repeated with a sheet of red glass, the colour of which has a dominant wave-length of 6250.

The reason for multiplying the result of the observations by f/f' is, that it would evidently be unfair to test objectives of different focal lengths on a near fixed object, for in some cases the ground glass would be close to the principal focus, and in others, far removed from it. It seems, therefore, advisable to reduce all results, so as to make them equivalent to observations taken on infinitely distant objects, and this is done by applying this correction. An assumption is here made that the difference of focus between different coloured rays in the same lens varies directly as the focal distance, and this, in all probability, though not strictly accurate, introduces an exceedingly small error in the results.

The blue and red glasses, which were selected and measured for colour by Captain Abney, form a perfect contrast, as may readily be seen by placing them together, and observing how very nearly completely all light is excluded.

By simply noting the difference of focus recorded in the certificate between observations made in red and white light, or between observations made in blue and white light (the latter being of far more practical importance), it can at once be told if the lens is, or is not, well corrected for achromatism. But it would seem desirable, as already remarked, to form an estimate of the actual amount of diffusion produced in the image as a result of any error that may be detected in the chromatic adjustment of the lens. Now, there can be no difficulty in determining the size of the disc of radius $b'w$, for bw has been directly determined by experiment, and, since the cone $b'bb'$ represents the cone of rays of maximum actinic effect, on this disc will be concentrated the bulk of the rays which produce the effect on the photographic plate. But what we want in reality to find is the radius $u'w$, since that has been shown to represent more accurately the radius of the disc of diffusion; it may, however, be remarked that no fault can be found on this head with the method of testing, because the probabilities of error are lessened by taking the observation with rays of the maximum actinic effect. With a lens not at all corrected for achromatism, the length between the different foci for different coloured rays varies approximately as the difference of the squares of the wave-lengths of the colours in question; and, taking the wave-lengths as above given, uw will be found to be to bw as 5 to 4. But it must be confessed that this rule may have little or no relation to the truth with a corrected lens, and it is merely adopted as the only approximation obtainable. It is assumed, therefore, that $uw = 5/4\ bw$. Let bw, the result obtained by the examination for achromatism $= a$; let the diameter of the disc of confusion, or twice $u'w$, $= \delta$; let the principal focal length of the lens $= f$; and let the effective aperture $= \varepsilon$. Then it can be seen, by reference to fig. 6, that—

$$a = \tfrac{4}{5}\,\frac{f\delta'}{\varepsilon} = 8\delta'\sqrt{(\text{C.I. No. of stop})}.$$

The table elsewhere, which gives the values of $20\ \delta\sqrt{(\text{C.I. No. of stop})}$, affords a ready means of obtaining the required results in the following manner:—

Knowing the C.I. No. of the stop, decide on δ', the diameter of the maximum disc of diffusion that will be tolerated; then, under the columns thus ascertained, look out μ in the table, multiply the figure there given by $\frac{2}{5}$, and the maximum difference of focus, a that can be tolerated between white and blue rays is thus obtained.

Or, in the line opposite the stop of the size under consideration, find a number equal to a, the observed difference of focus for white and blue rays; then δ', the diameter of the disc of diffusion, will 5/2 times δ, the figure given at the top of the column in which a has been found.

It may be observed that either the principal focal length or the position of the nodal point of emergence may vary as different coloured lights pass through a lens. It would not be difficult to investigate these two sources of error seperately, but the results would be of little or no practical value.

16. *Astigmatism. Approximate Diameter of the Disc of Diffusion in the Image of a Point, with stop C.I. No.* —— *at* —— *inches from the Centre of Plate* = 0·—— *inch.*

The following is the method of examination for astigmatism:—The room is darkened, and in front of the lens is placed a thermometer bulb, thus obtaining, by means of the reflection of the light of a small lamp, a fine point of light. The lens holder of the testing camera is revolved upwards or downwards about the horizontal axis so that the axis of the lens makes an angle, ϕ, with the path of the rays coming from the thermometer bulb; the angle ϕ is such that the point of observation represents the extreme corner of the plate of the size of which the lens is being examined; that is to say, if, in fig. 20, GG represents the position of the ground glass, then CP is equal to half the diagonal of the plate; this angle has already been found for previous tests. If the lens shows any astigmatism, the image of the point of light can be made to appear, first as a fine vertical line, and then, as the focus is lengthened, as a fine horizontal line. The focal scale is read off at each of these positions, and the difference, γ, between the two readings gives a measure of the astigmatism. But, in order to judge of the amount of astigmatism that can be tolerated, the diameter, σ, of the disc of diffusion

caused thereby should be calculated. This is done by multiplying γ, the difference of focal distance of the focal lines, either by $\frac{f}{f'^2}\frac{\epsilon\cos\phi}{2}$ or by $\left(\frac{f}{f'}\right)^2\frac{\cos\phi}{20\sqrt{(\text{C.I. No. of stop})}}$, where ϵ is the effective aperture, f the principal focal length of the lens, and f' the focal distance when the observation was made. As the thermometer bulb is placed at the same

Fig. 20.

distance from the testing camera as was the object in the examination for achromatism, the ratio f/f' is exactly the same as in that case. The same result may be obtained by the use of the table in the following manner:—Find the value of δ, the diameter of the disc of diffusion, on the supposition that the μ of the tables has the value just obtained for γ; multiply the value thus obtained for δ by $\left(\frac{f}{f'}\right)^2\cos\phi$, and we get σ, the required value of the disc of diffusion due to astigmatism. This is the quantity recorded in the Certificate of Examination.

Fig. 21.

That this is the case can readily be seen by reference to fig. 21 Here AB represents the effective aperture, F_1 and F_2 the positions of the focal lines, and PH the position that the photographic plate would occupy. At F_2 the image appears as a fine line perpendicular to the plane of the paper, and at F_1 it is represented by the line ab; half way between these two points the rays cut the plate in the form of a disc, of which $a'b'$ is a diameter. Any movement of the plate from this position must lengthen out the disc of diffusion in one direction or the other, and this, therefore, is the position that the photographer naturally adopts as his focus. By similar triangles—

$$a'b'/AB = F_2C/F_2N_1 \text{ and } F_2C/CN_1 = F_2H/N_1P.$$

Therefore, since CN_1 and F_2N_1 are approximately equal,

$$a'b' = AB \cdot F_2H/N_1P, = \frac{\epsilon}{2f'}\cos\phi\, F_1F_2.$$

Now F_1F_2 represents γ, the movement of the ground glass, which was the measurement recorded. In the case of the examination for achromatism, it was shown that it was unfair to conduct the test on a near object without applying a correction, so as to make the result equivalent to an observation on a distant object, and that this correction could be made by multiplying the measurement recorded by f/f'. For the same reason, $a'b'$ must be multiplied by f/f' in this instance to obtain the true value of σ. Thus—

$$\sigma = \frac{f}{f'^2}\frac{\epsilon\cos\phi}{2}\gamma = \left(\frac{f}{f'}\right)^2\frac{\cos\phi}{20\sqrt{(\text{C. I. No. of stop})}}\gamma.$$

In considering the combined effect of astigmatism and curvature of the field, it should be remembered that it has been assumed that the photographer would focus his plate in the position PH, as shown in fig 21, and that the principal focal surface, PH, was a plane; this is, however, never the case. If the focal surface is curved, it is evident that the best general focus is obtained by observing the image of an object at a position about half way between P and C on fig. 21. In fig. 22, which is part of fig. 21 enlarged, let KL be the position of the plate when focussed in this manner, the distance between KL and PH being, therefore, due to the curvature of the field. Through b' draw $b'g$ parallel to F_2a'; then, by comparing this figure with fig. 6, it will be seen that eg in both cases represents the diameter of the disc of diffusion due to the curvature of field. Since, in fig. 22, fe represents the longest diameter of the ellipse of diffusion due to the combined effects of curvature and astigmatism, and since it is equal to the sum of $a'b'$ and ge, the diameters of discs of diffusion due to these two causes taken separately, it will not be unfair to look upon the evil effect of astigmatism as a simple addition to the evil effects of curvature. In using the table already given in the manner described, it would therefore be better if we substracted the diameter of the disc of diffusion due to astigmatism from the diameter of the maximum disc of diffusion which is to be tolerated, and use the difference as the δ in the table; we should thus get a more correct notion of the size of the stop that could be used to obtain any required standard of definition. The objection to this use of the table is that the astigmatism, that is, the distance F_1F_2, varies to a certain extent with the size of the stop used during the observation.

Fig. 22.

In the above discussion it has been assumed that the focal lines are sharply defined. If this is not the case, the reasoning here given is defective, because the distance separating the focal lines is then no indication of the amount of diffusion. An exaggerated idea of the amount of diffusion due to astigmatism may thus be obtained by the above method of calculation, for the disc may have only half the diameter thus found. Therefore, unless the focal lines are sharp—that is, unless the image of a point appears as a *very* thin line, first in one direction and then in another—no entry is made in the certificate.

Objections have been raised to the use here made of the term *astigmatism*, when it is intended to mean the effect of spherical aberration on oblique rays, it has been proposed to limit the use of the word so as merely to signify cylindricity in the lenses, such as might be produced by turning them in a lathe with elliptical motion. Whatever may be the theoretical value of this objection, we fear that the use of the term has been so thoroughly incorporated into the photographic vocabulary, both in England and abroad, that it would now be impossible to substitute another expression in its place.

Leonard Darwin, Major R.E.

(To be continued.)

DETECTION OF GOLD IN DILUTE SOLUTIONS.

It is well known (says Mr. T. K. Rose, B.Sc., in the *Chemical News*) that, if large quantities of boiling water are poured into a solution of stannous chloride, a yellowish-white gelatinous precipitate of tin hydrate is obtained. If the water contains a little chloride of gold, the precipitate is coloured red (purple of Cassius). A solution of one part of gold per million parts of water treated in this way gives a bright rose-coloured precipitate almost instantaneously in a small test-tube. One in four millions gives a paler colour easily detected in a test-tube if comparison is made with the precipitate caused by distilled water. For more dilute solutions a greater bulk of liquid is required, and the precipitation is best effected in beakers.

If 0·0000311 grm. gold (one-millionth of an ounce Troy) is dissolved in 3·11 litres of water, and the solution, containing one part per hundred millions, is raised to boiling and poured suddenly into a large beaker containing 10 c.c. of a saturated solution of $SnCl_2$ in water acidulated by HCl so as to mix the two liquids as rapidly as possible, a bluish-purple precipitate is obtained. This precipitate, when collected in a test-tube, differs markedly in colour from a precipitate obtained by pure water in the same way. There seems no reason why a still more dilute solution of gold should not yield a colour if precautions are taken to ensure the complete mixture of precipitant and solution.

Quantitative results based on comparison may also be obtained with care, as the precipitates are quite stable in water. The presence of NaCl (3 per cent.), $CaSO_4$, KCl, KBr, NH_4Cl, a little free HCl, &c., or all of these, do not interfere with the reaction. The precipitate is soluble in ammonia and is re-precipitated, showing its original colour, on neutralising with HCl. Synthetically prepared sea water containing gold to the amount of one in twenty millions (three-quarters grain per ton) is equally sensitive, but the colour is in this case a blackish rather than a purple violet. I am proceeding to test real sea water in the same way, though quantitative results cannot be expected, since Sonstadt states (*Chemical News*, xxvi. p. 159) that only a small portion of the gold present is precipitated by stannous chloride.

This modification of a very well-known test appears likely to be useful in chlorination mills, where it is often desirable to detect the presence of gold in liquids containing as little as 1 in 5,000,000. The most dilute solution that reacts if treated in the ordinary way by $SnCl_2$ is one per million (*vide* text-books, *passim*), and then only after a lapse of some hours.

RECENT PATENTS.

PATENTS COMPLETED.

IMPROVEMENTS IN OR RELATING TO HAND CAMERAS.

No. 21,553. SAMUEL WHITE ROUCH, 180, Strand, London, W.C.—*November* 5, 1892.

THIS invention relates to certain details in the construction of hand camera fitted with my plate changing appliances, working in separate reservoirs or magazines detachable from the camera, as patented March 17, 1888, No. 4145.

My improved hand camera may be described as follows:—I provide it with two or more lenses adapted to fit the same flange in the usual way, one of them being of short focus and capable of including a wide angle of view, the other having a longer focus. This permits of any desired amount of the subject that is to be photographed being included in the picture.

The camera, which, when in its normal state for wide-angle views is very small, may be distended to any desired length so as to suit the lens or lenses of longer focus; this being effected by means of a bellows or gusset body attached to the front portion to which the lens is fixed, and to the rear portion in which the sensitive plate or film is carried. The extending of the camera for adjusting the focus, is effected by a suitable rack and pinion. A ground-glass screen is not necessary for sharp focussing, as this can be equally well done by means of suitable scales graduated and engraved to suit the various distances at which either of the lenses is in focus.

My improved hand camera has a swing back of any suitable construction, and the front to which the lens is attached has a suitable sliding motion, as to permit of its being moved in either a vertical or horizontal direction.

The exposure of the plate is made by means of the band-shutter described in Specification No. 6613, 1887, placed behind the lens, and having an orifice which passes across the lens with any required degree of rapidity.

In the detachable magazine I provide an index of any suitable construction, which automatically registers the number of plates that have been exposed from the magazine. This index is moved by the action of the lever, which must be pressed each time a plate is exposed. When, by the indication of the register, the full number of plates contained in the magazine is found to have been exposed, the light-tight shutter of the changing back is closed, the magazine is detached, and another, containing a fresh supply of plates, can be inserted in its place.

The rapidity of the exposing shutter is determined by a spring which, when much braced up, gives the greatest degree of rapidity; but the tension may be removed from the spring by releasing the pawl of a ratchet, as usually employed in such shutters, and in this state the shutter moves with a slow action—caused by the relaxation of the spring. By adjusting the bracing-up of the spring, any intermediate degree of rapidity is obtainable, and when once set, the action is always afterwards uniform.

What I claim is the use in connexion with the camera described in my Specification No. 6613, 1887:—1. The employment of more lenses than one, these being of wide and ordinary angle. 2. Adjusting the focus of lenses by rack and pinion attached to the body of the camera. 3. Placing the shutter behind the lens and adjusting the power of the propelling spring in the manner described. 4. The graduated scale for showing when the lens is focussed for any particular distance of object. 5. The application of a swing-back. 6. The automatic registration of the number of plates exposed. 7. An arrangement for moving the lens front in either a vertical or horizontal direction.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
December 12 ...	Darlington	Trevelyan Hotel, Darlington.
,, 12 ...	Dundee Amateur	Asso. Studio, Netherga', Dundee.
,, 12 ...	Lantern Society	20, Hanover-square
,, 12 ...	Norfolk and Norwich	Bell Hotel, Norwich.
,, 12 ...	North Middlesex	Jubilee Hall, Hornsey-road, N.
,, 12 ...	Putney	Boys' Gymnasium, Charlwood-road.
,, 12 ...	Richmond	Greyhound Hotel.
,, 13 ...	Derby	Smith's Restaurant, Victoria-st.
,, 13 ...	Great Britain	50, Great Russell-st. Bloomsbury.
,, 13 ...	Manchester Amateur	Lecture Hall, Athenæum.
,, 13 ...	Newcastle-on-Tyne & N. Counties	Mosley-st. Café, Newcastle-on-Tyne.
,, 13 ...	Paisley	Committee Rm., Free Lib. & Museum
,, 13 ...	Stockton (Annual)	Masonic Court, High-street.
,, 14 ...	Ipswich	Art Gallery, Ipswich.
,, 14 ...	Leicester and Leicestershire	Mayor's Parlour, Old Town Hall.
,, 14 ...	Munster	School of Art, Nelson-place, Cork.
,, 14 ...	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 14 ...	Reading	
,, 14 ...	Stockport	Mechanics' Institute, Stockport.
,, 15 ...	Birmingham Photo. Society	Club Room, Colonnade Hotel.
,, 15 ...	Camera Club	Charing-cross-road, W.C
,, 15 ..	Greenock	Museum, Kelly-street, Greenock.
,, 15 ...	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 15 ...	Oldham	The Lyceum, Union-street, Oldham.
,, 15 ...	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 16 ...	Cardiff	
,, 16 ...	Holborn	
,, 16 ...	Leamington	Trinity Church Room, Morton-st.
,, 16 ...	Maidstone	"The Palace," Maidstone.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 1,—Mr. A. Haddon in the chair.

A letter was read from the Photographic Society of Great Britain inviting the Association, as an affiliated body, to contribute examples of various printing processes to a series of albums which the Society have in contemplation. Consideration of the letter was deferred.

THE OLD METHYLATED SPIRIT.

Mr. L. MEDLAND said that recently, in reply to inquiry he had made at Somerset House, one of the officials waited upon him, and stated that permission would be given to him to obtain one gallon at a time of the old kind of methylated spirit direct from the methylator.

LANTERN SLIDES OF IRELAND.

Mr. F. W. HINDLEY gave a description of his experiences in the west of Ireland, illustrating his remarks by a large number of lantern slides made from negatives he had taken in the vicinity of the Connemara Mountains, Clare, Wicklow, Galway, and other places. Mr. Hindley, in allusion to the climate, said that between the showers the light was excellent, the greater brilliancy being due, he supposed, to the moisture in the atmosphere. He had used a hand camera throughout, most of his negatives being taken on films.

The slides shown embraced views of mountains, seascapes, studies of the peasantry, some of the hotels, the primitive coaches, beggars, priests, cattle, Irish shanties, castles ancient and modern, views at Kilkee, and many other "objects of interest." The series of pictures illustrated both the scenery of a large tract of Western Ireland as well as the principal characteristics of its poorer inhabitants, and was accompanied throughout by a running commentary and description of a humorous nature.

At its conclusion Mr. Hindley was thanked by the meeting, which was a large one.

Leeds Photographic Society.—December 1, Annual Meeting.—The report showed the present membership to be 105; the property of the Society, in appliances, furniture, and books, is now considerable; in photographic publications there is almost all the best books published, besides the current literature, annuals, &c., which are lent out to the members. The following gentlemen were elected Committee for next year:—Messrs. E. H. Jacob, M.A., M.D.; B. A. Burrell, F.I.C.; Godfrey Bingley; S. A. Warburton; Herbert Denison; Robert Steele; J. H. Walker; J. W. Thornton; H. P. Atkinson; T. Butterworth. Mr. GODFREY BINGLEY afterwards gave a lecture, entitled *Wanderings with a Camera in* 1892, illustrated by lantern slides.

Holborn Camera Club.—December 2, Mr. Fred. Brocas in the chair.—Mr. F. J. COBB gave a demonstration on the use of the optical lantern. Last Saturday the annual supper of the Holborn Camera Club took place at Anderton's Hotel, Fleet-street, Mr. Horsley Hinton in the chair.

St. Bartholomew's Hospital Photographic Society.—November 30, Dr. Russell presiding.—Mr. W. J. Armytage read a paper on *Daylight Enlarge-*

ments, in which he carefully explained the details of the making of enlargements by the use of an ordinary camera. After the paper there was an exhibition of prints and lantern slides by members.

Hackney Photographic Society.—November 29, Mr. W. A. Barker in the chair.—It was decided to hold a smoking concert on January 3 at the Club premises. Mr. Poole showed a P.O.P. print, which had been in the frame three weeks, but was not stained in any way. Mr. Beckett showed two prints, one on platinotype paper and the other on silver paper. Both had been kept in a very damp place. The platinotype print, however, was perfect, whilst the silver print had faded considerably. Mr. Wise and Mr. Houghton both showed flashlight pictures. Mr. Cross showed some negatives, and asked what was the matter with them. Mr. S. Beckett was of the opinion they were under-exposed and out of focus. Other work was shown by Messrs. Nunn, Moore, Soileau, &c. Mr. John Reynolds exhibited an Anschütz tachyscope, which was on the same principle as a wheel of life. Mr. TUNSTON asked how permanganate of potash is used as an intensifier, as per *Wall's Directory*. Mr. Beckett thought it stained the negative, and thus gave more printing quality. Mr. SODEAU, however, said there was a distinct chemical action. From the question box: "What constitutes a hand-camera picture?" Considerable discussion ensued on this question, in which nearly all took part. The Hon. Secretary gave the ruling of the Judges at the recent Exhibition, which was, "*Any* camera held in the hand is a hand camera." A vote taken on the question resulted in the following being the accepted answer:—"A hand camera *must* be held in the hand only, and *not* on *any* kind of *support*. Instantaneity is not essential, the natural limit being a question of how long it can be held as mentioned. If placed on a *stand* or any other support it is *no longer a hand camera*. Size is *immaterial*. Mr. R. BECKETT said he was of opinion that the composition should also be done upon the ruler. The Hon. Secretary stated that next meeting would be a lantern night.

Leytonstone Camera Club.—December 3, Mr. Tom Symmons in the chair.—A discussion on *Photographic Dodging* was opened by Messrs. H. H. Symmons and F. W. Wates. Mr. SYMMONS commenced his paper on the bugbear *Halation*, and after describing the various causes, went on to the remedies, advocating backing the plate with Vandyke brown in a creamy paste with water and a little glycerine; he also found, if only present in a small degree, it could often be removed from the negative with methylated spirit applied with a piece of chamois leather. The great care that the inside of the bellows should be dead black was next gone into, he explaining that that was frequently the cause of bad negatives, particularly when using a lens of greater covering power than the plate exposed. He also mentioned the advantages of using the front or back combination of a rectilinear lens which would be found about double the focal length of the doublet, and how often the extension of the bellows did not permit the opportunity of using it: and showed how he overcame the difficulty by having a piece of brass tubing made to extend the barrel of the lens when using the front combination. Mr. WATES here took up the parable, and went on to the question of improving or dodging negatives by means of intensification and reduction, demonstrating by means of Dr. Monckhoven's formula. He next described the means of ascertaining that the plate was in correct register with the focussing screen, and the means of detecting the presence of actinic light in the dark room. How to test the focal length of any lens and the value of any stops was next explained, and he also showed a very simple view-meter, and went into the different methods of vignetting, advocating tracing the outline with tissue paper, cutting out the shape on card, serrating the edge, fastening on the printing frame, and packing underneath with cotton wool. Pulling the wool out into fine shreds gave a very soft vignette, and also gave a ready means of at once slightly altering the shape, if necessary, when printing. Blocking skies and other printing dodges were next described. Five gentlemen were elected, making up the number roll to 123. The first annual dinner takes place on the 10th inst.

Kensington and Bayswater Photographic Society.—December 5, Mr. S. C. Mason presiding.—Three questions from the box were read and discussed. The first was in reference to the exposure required for snow pictures; the second as to whether it was possible that a fairly developer should produce a partial reversal of the image on a negative, as one of the members had a batch of negatives giving this result, and he could not account for it in any other way, as he was convinced that the exposure given was practically correct. The President stated that if by accident any tiny chamble got into the developer it would cause instantaneous reversal. The next question referred to enlarging from films. One of the members found that when he placed his film in the enlarging lantern it crinkled and became useless, even though he adopted the plan of safely pressing the film between two pieces of plain glass. It was suggested that this might have been caused by the films not being perfectly dry.

West Surrey Photographic Society.—November 30, Mr. James in the chair.—The subject of the evening was a demonstration of the uses of *Cresco-Fylma*, by Messrs. Hill Brothers, of Surbiton. The mode of procedure is as follows:—The negative is immersed in a diluted solution of the mixture (three parts of concentrated solution to one of water); in a very short time the film leaves the glass support. After this takes place it should be left in the solution for about two minutes, and then, supported by the glass it has just left, the free film is transferred to another dish containing simply water. Then the enlarging commences, and in about fifteen minutes it has reached its maximum growth of about twice its original size. The film is then floated on to its support, whether glass, porcelain, or paper, it matters not, the air bells blown from under the film, and then allowed to dry. After drying it is necessary to wash the film as in an ordinary negative or transparency. The enlarged film shows no signs whatever of distortion, nor loss of sharpness. In cases where the pyro solution in developer had been used, enlargement took place less readily and did not proceed so far. It was also pointed out by Messrs. Hill that, if the subject is badly placed upon the plate, it may be slightly enlarged and shifted on the same plate. In the discussion it was pointed out that the patentees seemed to have given their attention only to the enlarging properties of their solution, and had neglected the fact that they could procure a perfectly uninjured free film, which fact alone should make their article invaluable. Again, workers of the carbon process will find this solution a great boon, inasmuch as the tedious and uncertain double-transfer process can be made as simple and as certain as the single transfer. All that is needed is to float the film of the negative in a very dilute solution of "cresco" to avoid enlarging, and then reverse the film on to another glass. When printed, the result would, of course, be the same as if finished by the double-transfer process.

West Kent Amateur Photographic Society.—December 3.—Mr. A. R. DRESSER gave a lecture on *Amidol and Its Uses*. The lecturer said that he found this developer very good for negative work, bromide paper, and lantern slides, it behaving exceedingly well with bromide paper printing and enlarging from very dense negatives. The developing formula sent out by makers he soon gave up, it very soon turning colour, and after making several experiments he struck upon the following formula, which worked well:—Amidol, 1 ounce; meta-bisulphite of potassium, 1 ounce; water, 10 ounces. To use with this Mr. Dresser makes up a saturated solution of washing soda, a saturated solution of carbonate of potass, and a ten per cent. solution of bromide of potassium. He recommended a start with developer as follows for plates, normal exposure:—Amidol, 1 drachm; saturated solution of washing soda, 1 drachm; water, 1 ounce; and 2 drops of ten per cent. solution of bromide. This will also answer well for lantern plates. For extra density add a few drops of carbonate of potass solution as required. Formula for bromide papers:—Amidol solution, 6 drachms; carbonate of potass solution, 6 drachms; water, 10 ounces; ten per cent. solution of bromide, 30 drops. The lecturer recommended a trial of this developer, and handed round some prints and slides he had obtained, which showed good results.

Croydon Camera Club.—December 5, the President (Mr. H. Maclean, F.G.S.) in the chair.—Mr. W. H. Smith demonstrated, to a good attendance of members, who appeared keenly interested, the various ways in which glycerine may be used in conjunction with the oxalate developer in platinotype printing. The working of the oxy-magnesium lamp was also shown. Inasmuch as it is available for printing in silver as well as platinotype, the President remarked it was a matter for wonder that the profession did not make more use of it. Mr. Smith stated he had successfully used the lamp for portraiture, exposure being three seconds, marking at *f*-8.

Croydon Microscopical and Natural History Club (Photographic Section).—December 2, Mr. W. Bulgen in the chair.—Subject, *Blocking out and Printing in*. The Chairman, after introducing the subject, passed round a set of prints illustrating the various difficulties encountered when printing in clouds, &c. Various methods were then described, showing how they might be overcome by the judicious use of tissue paper and masks, or by printing with oil colours on the back of the negative. The addition of figures to a landscape on albumen paper did not present any special difficulty if the figures were first printed and then, after they had been carefully painted over with Indian ink, the landscape printed. When gelatine paper was used, a mixture of gamboge with turpentine or other medium which did not affect the gelatine was suggested in place of Indian ink.

Bath Photographic Society.—November 30, Mr. Austin J. King (President) in the chair.—He drew attention to the examples of work sent for exhibition that evening, which included many beautiful specimens, and which would be examined with interest. Some time was then profitably spent in viewing the various exhibits of the members' work during the summer. The remainder of the evening was devoted to displaying lantern slides. Mr. Braham showed two photographs he had taken from a balloon: one ascending, altitude 4200 feet; the other descending, altitude 6000 feet. And he gave a brief account of his aerial journey, pointing out that for map work by balloon photography above 6000 feet from the earth a peculiar fogging or obscuration was manifest.

Burnley Photographic Society.—November 30, Mr. John Butterworth (President) in the chair.—Mr. Buchanan Wollaston, of the Platinotype Company, gave an address on *The Development of Platinotype Prints*. He showed by means of experiments not only how various tints up to sepia might be obtained, but how the development might be retarded by glycerine.

Derby Photographic Society.—November 30, Mr. Richard Keene in the chair.—Captain W. de W. ABNEY, C.B., F.R.S., read a paper on *Hand Cameras and Shutters*, and prefaced it by remarking that, as President of the Society, he had great pleasure in coming amongst them, in response to the kind invitation which they had given him. Although the tie which formerly bound him to Derby was almost broken, still he could never forget that he was a Derby man and owed a very great deal to Derby and Derbyshire. Captain Abney then proceeded with his subject, remarking at the outset that, had he known previously that there would have been such a large sprinkling of ladies in the audience, he should have endeavoured to impart into his paper more matter which would have interested them in particular. When one went to London, one was apt to look at the scientific side of things more than the artistic side, but in the paper which he was about to read to them he had endeavoured to blend the two sides together. The Captain then went on to speak of the use of the camera and how to manipulate it so as to get the best possible results in various positions. He said he wanted to make it understood that a small ordinary camera might be made something more than a mere toy, and should be made to do some very serious work. The simpler the form of the camera, the better it was likely to be. One important question which often came to the ears of photographers of experience was as to whether movement was detrimental to the production of a clear, sharp picture. Some people said it was, but he was afraid the persons who said so argued without knowing the facts. If motion was applied to the whole camera and equally distributed, it was just as possible to obtain a good sharp photograph as though the camera had remained quite still; but, if the motion were unequal, one end of the camera moving without the other, then the picture was robbed of its sharp outlines. Captain Abney went on to say that some of his best pictures had been obtained on a dull day, and in describing the use of the hand camera, the importance of gauging distance, and the use of the bubble, he said that he had frequently used his umbrella as a camera stand, or even his walking stick. The lecture,

which was most interesting to all lovers of photography, was illustrated by means of the oxyhydrogen lantern, and some very good diagrams, illustrative of the remarks made, were passed round amongst the audience. At the conclusion of the paper a hearty vote of thanks was accorded to Captain Abney for his kindness in being present and giving such valuable information to the members of the Society.

Maidstone Amateur Photographic Society.—December 1.—Mr. ANDREW PRINGLE gave an address on *Lantern Slide-making*. It embraced a thoughtful *résumé* of the artistic aspect of the subject, later on turning to the scientific side of tonality and gradation. The various processes of slide-making were then discussed, and information given on the practical working of many points in reply to questions. Mr. Pringle concluded by specially emphasising the qualities of a good lantern slide, and spoke in favour of a medium tone neither too cold nor warm, and the necessity for all the details of the shadows being clear and visible on the screen.

Leith Amateur Photographic Association.—November 29, the President (Mr. Wm. Macdougall) in the chair.—The Secretary displayed one of the latest aspirants for public favour the "Developer," in demonstrating which he stated that this idea of developing an exposed plate in ordinary protected light was one which had taxed the abilities of many men, and this one, if carefully used, would do all that it claimed to do. The arrangements were neat, and the whole thing was well made, and might suit many who had not the usual dark-room appliances. Being the annual exhibition meeting night, the members occupied themselves with examining and criticising each other's work. Our correspondent says: "One of the things to be noted and objected to in this body's work is the apparent contentment to copy engravings of well-known pictures, such as Maclise's *Origin of the Harp*, Sir Noel Paton's *Oberon and Titania*, as well as Thos. Faed's *Tam O'Shanter*. Were those subjects taken from the original pictures, with the many difficulties attending such reproductions, there might be less need to notice such work; but copied as they are from ordinary black and white engravings, and well executed as they are, they should only be a stepping-stone to the much higher efforts of attacking the original pictures. There is one example of such a kind by the late David Scott in the Trinity House of Leith which I do not recollect of being reproduced in any but the most ephemeral form, *The Rounding of the Cape of Good Hope by Vasco de Gama*. Let some of the enthusiasts of this Society try that, and, if they succeed, they will have achieved a new honour to themselves and the Association they represent. The more noticeable exhibits were those of Mr. Guthrie, whose enlargement, *Newhaven Fisherman blowing his Baccy*, was fine, the President's clever groups, and Ewart's studies of children. Some fine examples of work were exhibited by E. A. Davies, Campbell, Hendric, and Goodall, and the entire show betrayed no falling off from the previous high standard of this Society's work. Again, may I draw this Association's notice to the desirability of their meetings coinciding with the issue of the yearly ALMANACS, which are the notifiers and recorders of the current office-bearers and meeting dates of the principal societies throughout the world? It would be welcome to all concerned."

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

SOUTH LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

To the EDITOR.

SIR,—As a reader of your valuable paper, I have noticed your general remarks tend to help on photography, whether practised by individuals—amateur or professional, or societies and clubs—and, in the same spirit, as a comparatively recent recruit in the ranks of amateur photographers, I have been somewhat crushed by the thought that possibly merit is not the only requirement for success, and such being the case, I am afraid to prepare work for the Exhibition of next year, having no hope of success. I have been led to this conclusion by the result of the Exhibition of the South London Photographic Society, held just recently. I was not an exhibitor, therefore my opinion is perfectly unbiassed, and I do not give it altogether as an opinion, but am rather seeking information by asking the following questions:—Was it right to expect the Judges (gentlemen of good stature and fine physique) to grope about on the floor to find work—pronounced "good" by many members, but which they could not possibly judge well under such peculiar arrangements as these? Is it usual for the Judges to have in their hands catalogues which give the number and name of exhibitor clearly set forth, when the conditions distinctly stated: "Names of competitors will be covered during judging?" The lantern slides were splendidly shown; but why, Mr. Editor, were some of them hurried through, and others kept on for a few momenta to wait for the applause, and why were some omitted altogether without a reason being given? As an amateur of about two years' experience, my pictures were not anywhere near good enough to be classed with numbers of those which had no opportunity of being appreciated by reason of their separation from each other—some on the ground, some hung where they could not be seen, here and there, on the "find-them-who-can" principle; and my contention, expressed by many others also, is that tactics like these tend to keep such as myself from attempting to join the army of conscientious artists, who desire to make their profession an art, and who look to the expression of the honest judgment of the many (rather than the opinion of acquaintances) as a means to their attaining that end. This cannot be done, nor our Societies make real progress, unless all have the opportunity to receive either compliments or criticism, and, surely sir, this was not the case in the Exhibition under notice. I have purposely avoided writing anything that might have caused pain to individuals, but I believe a little wholesome criticism from abler pens than mine may conduce to true "progressiveness" in the Society, which I hope will strive to encourage others who, like myself, could sign themselves as persevering and ambitious, in its highest sense.—I am, yours, &c.,

YOUNG MEMBER.

December 3, 1892.

"THE SPEED OF PLATES."

To the EDITOR.

SIR,—In justice to ourselves, we should like to refer more fully to the correspondence that you published last week under the above heading.

The plates of which we advertised the rapidity were tested, not by us, but by a competent independent gentleman, Mr. Alfred Watkins.

The sensitiveness reported to us was 150 on "Watkins' scale," and we considered we were quoting an accepted published ratio in stating that 150 "Watkins' scale" equalled 100 on Hurter & Driffield's.

So soon as Messrs. Hurter & Driffield raised any doubt as to the accuracy of the figures on their scale, we immediately withdrew their name from our advertisements, being quite content to accept the reading of the "Watkins' scale" alone, especially when given by such a *practical* expert as Mr. Watkins. We do not care to adopt the Hurter & Driffield actinograph until it is recognised as a standard instrument, by the Photographic Society of Great Britain, or by a suitable body of scientific men capable of deciding its merits. The mere fact of its being adopted by one or two plate-makers has no influence with us whatever. Meanwhile we are satisfied to have our plates tried by the "Watkins'" method, being the only *one* based on an actual camera test, we estimating that 999 plates out of 1000 *are* used in the camera. The whole question of branding the sensitiveness of plates on each packet is a most serious one, both to the manufacturer and to the trade.

As manufacturers we have nothing to fear in the future in respect to rapidity if we branded our plates, but the interests of the trade must be considered.

The system of branding plates adopted by manufacturers using Hurter & Driffield's actinograph may be fair to the purchasers, but are most unjust to the trade (both wholesale and retail), that *stock* their plates. Our plates, if *branded* this week 100 Hurter & Driffield, would be at a heavy discount (practically dead stock) if we were to issue 125 next week. Who ought to bear such a loss? Surely not the trade who stocked our goods, on our representations of only a week since.

Our company will not adopt any system of branding plates that is detrimental to the trade's interests. When it can be clearly shown us that the branding of plates would be advantageous to the trade, we shall be only too pleased to adopt their views.—We are, yours, &c.,

THE IMPERIAL DRY PLATE CO., LIMITED,
T. E. H. BULLEN, *Secretary*.

Cricklewood, London, N.W., December 5, 1892.

LANTERN SLIDES OF LIFE AND CHARACTER.

To the EDITOR.

SIR,—I am desirous of obtaining studies of life and character in all parts of the world, and, although I know it is a tall order, yet venture to utilise your columns (with your kind permission) to make known my yearning desire. First, however, I don't want something for nothing, but for every slide sent me an equivalent will be given. My offer is to give slide for slide. Any of your readers who may be in possession of hand-camera studies of street life, native characters, or scenes which will illustrate the life of that particular country, I should be glad to hear from. I will exchange any number (not exceeding eighteen) slides of English street life and character for a corresponding number from a foreign or colonial fellow-worker.

Although hand-camera shots would be preferred, as giving better renderings of life, yet I by no means wish the series thus limited. My object is to form a set of slides of an interesting and instructive nature, which will be ready for use by next season. I should be glad to hear from any one in this country as well who may possess suitable slides taken by them on a holiday trip abroad.—I am, yours, &c.,

47, *Hagley-road, Birmingham.* WALTER D. WELFORD.

MESSRS. HURTER & DRIFFIELDS' PAMPHLETS.

To the EDITOR.

SIR,—We are sorry that Mr. Cresswell has had the trouble of making the explanation which appeared in your issue of last week, and we beg to inform those who have made inquiries from him, and others interested,

that we have a *limited* number of reprints of our papers on "Photo-chemical Investigations and a New Method of Determination of the Sensitiveness of Photographic Plates," and on the "Relation between Photographic Negatives and their Positives." These reprints we shall be pleased to forward to applicants on receipt of names and addresses.—We are, yours, &c., F. HURTER.

Appleton, Widnes, December 5, 1892. V. C. DRIFFIELD.

EAU DE JAVELLE OR OZONE BLEACH.

To the EDITOR.

SIR,—Your correspondent, "S. V. W.," will find, in THE BRITISH JOURNAL OF PHOTOGRAPHY for 1885, page 124, instructions for making this. As he may possibly not have the volume, I give the particulars. Take four pounds of washing soda, and pour on it one gallon of boiling water; continue boiling till all is dissolved. Remove from the fire, and add slowly, with continued stirring, one pound of fresh chloride of lime, free from lumps. Allow to cool, and strain off the white, insoluble residue. The fluid should be kept in stoppered bottles. If this is to be used for prints after fixing, one drachm should be added to eighteen ounces of water.—I am yours, &c., CLIFFORD E. F. NASH.

[The above particulars appear in an article by Dr. Ellerslie Wallace on the "Elimination of Hyposulphites." At page 784 of the last ALMANAC appear two formulæ for the preparation of Eau de Javelle and Labarraque's solution. Whether either of these is identical with Holmes' Ozone Bleach we cannot say, but they answer the same purpose.—ED.]

PURITY OF OXYGEN.

To the EDITOR.

SIR,—The employment of oxygen for the limelight and other purposes has increased enormously since the commercial introduction of the Brin method, by which the gas is separated from atmospheric air by a now well-known chemical process. The gas so obtained is practically pure, analysis showing that, as now supplied by the Brin companies, it contains on an average 95·0 per cent. of oxygen, the remaining 5 per cent. consisting of inert nitrogen.

The success of this comparatively new industry has been so marked, that, as a natural result, competitors with rival processes have come forward. Some of these met with failure at an early stage of their career, but others are supplying oxygen to the public. This is by no means a state of things to be deplored from the consumer's point of view, if the product from the one source is as good as the other, for benefit generally arises from healthy competition. But when the rival product turns out to be, not oxygen, but a half and-half mixture of oxygen and air with a slight excess of the latter, the competition is of a decidedly unhealthy character, and is correspondingly bad for the consumer. I recently obtained a sample of gas from a dealer, which on testing (with a Hempel absorption pipette charged with metallic copper and ammonia) I found to be a mixture containing only 60·6 of oxygen. I next tested the illuminating value of this highly diluted oxygen with a limelight jet, and, for sake of comparison, placed by its side a precisely similar jet supplied with Brin's oxygen, and, as might have been expected, the light given by the former was little more than one half as intense as that afforded by the latter. With the good oxygen the lime was quickly pitted, whilst the other showed no sympton of destruction. It is also to be remarked that the consumption of the diluted gas is, for a given period, about one-third more—striving with both jets to get the best possible light—than that of good oxygen. On the same principle, a mountaineer at a high altitude will pass more (rarefied) air through his lungs in a given time than he will when he is in the valley breathing that which contains the normal quantity of oxygen.

As this matter is of great importance to many workers, I trust you may be able to find room in your valued publication for these words of necessary caution.—I am, yours, &c., T. C. HEPWORTH,

Author of the "Book of the Lantern," &c.

45, St. Augustine's-road, Camden-square, N.W., December 6, 1892.

Exchange Column.

*** No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Will exchange a Dallmeyer 2a lens for a Dallmeyer 4D; difference adjusted.—Address, MCISAAC & RIDDELL, Studio, Oban.

Will exchange 18×12 hot-rolling machine by Bury Brothers for Vanneck hand camera.—Address, W. WALKER, 156, Nocl-street, Nottingham.

Wanted to exchange *carte* lens by Squire, in good condition, for 10×8 or whole-plate portable rectilinear lens, adjustment by cash.—Address, EVERARD CUZNER, White Rock Studio, Hastings.

Will exchange rapid 10×8 portrait lens in good condition for 9×7 Optimus cenyscope lens in similar condition. Specimen of work sent.—Address, J. K. SMITH, Little London, Rawdon near Leeds.

Wanted, photographer's show-case, brass scales on stand, also posing chair. Will give in exchange superior cabinet rolling machine and scenery background, also mechanical negro and harp.—Address, A. D. CLARKE, photographic artist, &c., Pailton, Rugby.

PHOTOGRAPHIC CLUB.—December 14, Members' Open Night. *Demonstration of Paget Printing-out Opals and Lantern Slides.* 21, *Amidol and Other New Developers.*

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB.—December 14, Mr. T. Charters White, M.R.C.S., will give a demonstration on *A Simple Method of Photo-Micrography*, with lantern illustrations.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Ordinary Meeting, Tuesday, December 13, at 50, Great Russell-street. Major Darwin, R.E., M.P., will read a paper on *Lens Testing at Kew.* There will be no Technical Meeting in December.

IN the *Gazette* of 25 ult., containing the names of Volunteer officers who have received the decoration for long service, appears the name of Major J. Pattison Gibson, 18th V.B. Northumberland Fusiliers, who this month completes his thirty-third year of Volunteer service.

THE BENEVOLENT.—A committee meeting was held on Monday, December 5, in the rooms of the Photographic Society of Great Britain, Mr. W. Bedford in the chair. There were two applications for assistance, both in money and in finding situations. Both cases had been investigated by the Secretary and by a member of the committee, and the applicants attended and were interviewed by the full committee. In both cases the desired loans were granted. The Secretary reported on the disbursements of the moneys granted at the last meeting, and was able to report favourably on the progress of one or two men who have during the past few months been rescued from desperate straits by the Association. The Secretary was instructed to write to all subscribers of the Association who did not subscribe for the present year, asking them to continue their support, as the pressure of the season is being keenly felt by many photographers. The Secretary also reported that certain overcoats and boots which had come to hand had been highly appreciated by men who were in great difficulties, and asked the members present to supply certain other articles of clothing, which amongst them they were able to promise.

A NEW "shortened telescope," constructed by Dr. R. Steinheil, is (says *Nature*, described in the *Zeitschr. für Instr.* for November. The principle resembles that adopsed by Dallmeyer and Dr. A. Steinheil in their tele-photographic objectives. A negative system is introduced between the object-glass and the eyepiece, thus increasing its equivalent focal length. If a be the focal length of the objective by itself, r its distauce from the negative lens, and the magnification m times that produced without the negative lens, the total length of the tube is given by $l = r + m(a - r)$. In a telescope actually constructed on this system, the object-glass has a focal length of 16·2 cm. Its distance from the nearest surface of the negative lens was 12 cm., the equivalent focal length 60·8 cm., and the total length 27·8 cm. Hence the magnification was 3·75 times that obtained by using the objective alone. In this case, then, a magnification of 22 diameters was obtained with an effective aperture of 4 cm., a total length of 27·8 cm., and a one-inch eyepiece. If the same magnification and illumination had to be obtained by a long-focus objective, the length would have to be 60·8 cm. Thus the length is reduced by more than one-half without the usual disadvantages of short telescopes and eyepieces of high power.

ABSORBING POWERS OF DIFFERENT COMPOUNDS.—Of one heat ray of a burning lamp it is stated that there will be absorbed by passing through:—

Rock salt (colourless)	8 per cent.
Fluor spar	28 ,,
Flint glass	33 ,,
Glass used in the manufacture of mirrors	61 ,,
Calcareous spar	61 ,,
Rock crystal	62 ,,
Citric acid	89 ,,
Alum	91 ,,
Sugar candy	92 ,,
Ice	94 ,,

The difference in the behaviour of heat and light rays is strikingly shown in the case of common copperas, which absorbs all heat rays, but allows the easy passage of the blue rays. A watery solution of album will absorb nearly all heat, but to a very small degrees only the actinic rays, whereas an alcoholic solution of iodine absorbs the greater parts of actinic rays, permitting the passage of the heat rays. The loss of the actinic power of light in its passage through different kinds of glass is said to be as follows:—

	Thickness in Centimetres.	Loss per cent.
German window glass	0·15	4·2
Crystal	0·3	8·6
German plate glass	0·3	13·0
English crown	0·3	13·0
Frosted glass	0·15	50 to 60
Matt glass	Ground glass.	12·5 to 17
Orange yellow	0·12	51
Green window glass	0·15	82
Deep ruby	0·25	90
Opal	0·15 to 0·3	60 to 70
Porcelain	0·15	97

The loss of actinic power varies with the quality of glass employed. Greenish glass, if ever so slightly tinged, will absorb from two to four times as much light as glass of the colour of pure water. The loss of actinic power amounts, as a rule, from three to ten per cent. for each millimetre of thickness, the rays of light striking the glass perpendicularly.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & CO.," *2, York-street, Covent Garden, London.*

*** Editorial table and several other communications in our next.

J. A. FORREST.—Received. Thanks.

W. S. LILLY (Lincoln).—The example of collotype work sent is excellent.

F. J. GARRISON.—Mr. H. N. King's address is 4, Avenue-road, Goldhawk-road, W.

T. BRAMWELL (Alston).—No doubt the lens would answer for the purpose. The heat of the lantern would, in all probability, not affect it.

S. TALLON.—You will find a reference to the sulphurising of asphalt, by Herr E. Valenta, at p. 614 of the volume of this JOURNAL for last year.

J. PIKE.—A copy of Liesegang's *Manual of Carbon Printing* might possibly be obtained by advertising for it. We can suggest no other course.

W. BLEASDALE, of St. Helen's, asks: "Would you please inform me where I could get good carbon transfer paper?"—Of the Autotype Company, 74, New Oxford-street, W.

HANTS.—If you can prove there is no novelty in the invention, and that it was in use prior to the date of the patent, you can make the apparatus, as the patent is not a valid one.

T. WILCOCKS.—The manual on the carbon process, published by the Autotype Company, will give every particular. If any difficulties are experienced in working it, we shall always be pleased to advise.

HENGIST.—If you send in pictures for competition, representing them to be what they are not, and a prize is awarded for them, the prize is obtained by misrepresentation, which may be construed into a fraud, and might subject you to a prosecution.

G. B. ASTOR.—The work to which you refer is by Mr. Chapman Jones, and is published by Iliffe & Son. Mr. Chapman Jones is a sound writer, and any statements made by him can be relied on. The title of the book is *Introduction to the Science and Practice of Photography.*

N. M. M. asks: "Can you tell me where I can get a book on sunk mount cutting?"—A work on this subject was published by Kent & Co. some years ago, but whether it is in print now we cannot say. Its title, if we remember rightly, was *The Carver and Gilder's Guide.*

T. OFFER.—The cause of the fading is very likely indeed to be due to the hyposulphite of soda. For four shillings per cwt. hyposulphite of soda fit for photographic purposes must not be expected. It may answer very well as an anti-chlor in paper-making, for which it was very probably sold originally.

PERPLEXED.—The print is by the Meisenbach process. That and cognate methods of book illustration are referred to in the editorial article of the forthcoming ALMANAC. The screens are not, we believe, obtainable in England. Wolfe, of Dayton, Ohio, U.S.A., and some Continental firms, supply them.

C. SCHMIDT (Dresden) asks if there is any varnish for negatives known in England that can be applied without the negative being warmed; and, if so, how it is made.—Such a varnish is well known here, and it is simply a solution of Dammar resin in benzol. The better the quallty of the resin and the solvent, the more satisfactory will be the varnish.

W. GIRLING.—White blinds will be best for the north side of the studio. For the south side, dark ones, such as dark blue or green, and of a thicker material, will be preferable. As the south side is already glazed, we should not advise its being blocked up if good-fitting blinds are provided, as for certain effects the light may at times prove useful.

S. TABRUM complains that, in making collodion for enamelling prints, the collodion is much too thick to flow over the plate, although only half the quantity of pyroxyline generally recommended was used, and the addition of more ether and alcohol does not make it much better.—The pyroxyline is of an unsuitable kind or the purpose, and the remedy is obvious.

S. A.—The albumen process has so often been described, and full working details given, in these columns that they cannot be repeated, at least for the present. The reason why the process is not worked more generally is that it involves more trouble and requires more experience than most other processes. Even if the plates could be purchased ready for exposure, like gelatine plates, the method of development and toning would have to be learnt, as it differs entirely from the treatment of gelatine plates.

FADING writes as follows: "I enclose two silver photographs which have faded badly in a few days. I have many prints like this recently, and cannot understand it. They are fixed and washed in the ordinary manner, as I have done for years. I should blame the paper did it occur in all; the paper is home-sensitised. Hypo soda from Marion's; silver bath, fifty grains; fixed from ten to fifteen minutes. I should be glad if you can suggest cause. During past season I must have sent out dozens, none probably as bad as these. These now sent were printed last week only."—This is one of the worst cases of spottiness we have seen to occur in so short a time. Possibly the evil may be due to the mountant or the mounts, which are printed in bronze. Our correspondent should test the latter, or, if he is not capable of doing it himself, send them to an expert for analysis. Bronze powder is a very prolific source of spots, and should always be avoided.

DEVONSHIRE says: "About two years since I saw in the JOURNAL a capital mountant; it was rice flour, with instructions how to make it for keeping for use. I cut the paragraph out, and carefully put it away for future use, but now cannot put my hand upon it. Can you give me particulars?"—We don't remember the article for the moment; but, if a paste be made in the same way with rice flour as with wheaten flour, it will answer quite well. A few drops of oil of cloves may be added as an antiseptic.

J. E. C. says: "A quarter-plate camera of mine has extra long extension. The leather bellows have at the smaller end, just behind the lens, developed a crease where there should not be one, the result being sagging of the bellows, and cutting off part of the picture when using wide-angle lens. Could I stiffen the bellows by a coat of glue, isinglass, &c., applied internally? If so, what do you think would be the best thing to apply?"—Possibly the best means of stiffening the bellows would be by the insertion of a piece of cardboard.

UNDECIDED.—For taking such a group as a football club, while it is always best to employ a lens specially constructed for the purpose, yet are good pictures produced by lenses of the cemented rapid type. Some photographers, whose means are rather limited, make use of landscape lenses for the purpose, but these necessitate a longer exposure than would be necessary with the former class. Of course, if both of the classes of lens, a group and a landscape, are worked with stops of the same relative apertures, the exposure will be practically equal. For such a subject as that mentioned a more pleasing picture will be obtained by placing the camera at a distance from the figures, using a lens of moderate angle, than when employing a wide-angle lens nearer at hand.

R. T. says: "A little while ago I had a sitter to take cabinet size, and, she being a fine subject, I took a 15 × 12 negative on my own account that turned out a fine picture. I offered the portrait to the lady's friends for half my usual price, but they declined to purchase; so I have used it as a specimen in the window, and also have a print in a show-case. Now the father of the lady threatens me with legal proceedings if I do not stop showing the picture. Will you please tell me if he can do so, as I made no charge for taking the portrait?"—This is a point that, so far as we are aware, has not been contested. But we think there is very little doubt that, if proceedings were taken, an injunction would at once be obtained, and the defendant would find himself involved in heavy costs.

W. R writes: "I shall be glad if you can give me a little help. I have been making wet-collodion transparencies in the camera, and have succeeded very well, except for one defect, which more or less impairs the quality of nearly all the slides, viz., crapy lines running diagonally across the plates. I rock the plates and let them set well before sensitising. I am using ——'s negative collodion, with iron development and a substratum of dilute albumen. I never used to meet with this trouble in the old wet-collodion days, so that I cannot account for it."—Crapiness is usually due ro an unsuitable pyroxyline in the collodion, or its being made with too weak solvents. But this is scarcely likely to be the case with the collodion named, more particularly as some of the pictures are free from the defect. Try the effect of coating the plates more slowly—that is, allowing longer time before the plate is brought to the vertical position—and do not rock so quickly.

WEST LONDON PHOTOGRAPHIC SOCIETY.—December 13, General Discussion on Photographic Subjects.

MADDOX FUND.—A sum of 4*l.* 17*s.* 5*d.* has been received towards the above fund from the Photographic Society of India.

LONDON AND PROVINCIAL HOTOGRAPHIC ASSOCIATION.—December 15 Monthly Lantern Night. 22, Ordinary Meeting.

MESSRS. FUERST BROTHERS are now issuing amidol in cartridges. One tube contains sufficient of the reagent to develop ten half-plates.

FORTHCOMING EXHIBITIONS.

1893.	
February 18.....	Holborn Camera Club. Hon. Secretary, F. J. Cobb, 100 High Holborn, E.C.
March 1, 2	*Fillebrook Athenæum Photographic Society. Hon. Secretary, Joseph W. Spurgeon, 1 Drayton Villas, Leytonstone, Essex.
April 17-29	*Photographic Society of Philadelphia. Hon. Secretary, R. S. Redfield, 1601, Callowhill-street, Philadelphia, U.S.A.

* Signifies that there are open classes.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1702. Vol. XXXIX.—DECEMBER 16, 1892.

OUR 1893 ALMANAC.

The British Journal Photographic Almanac for 1893 is now in course of publication. It contains a larger number of pages, devoted respectively to the text and to commercial announcements, than any previous volume, the exact number of pages being 1236, an increase of sixty-eight on last year.

The editorial article is devoted to "Some Photographic Methods of Book Illustration," and includes practical details of the principal photo-mechanical processes in modern use. Among the contributors to the volume are Captain Abney, Professor W. K. Burton, Mr. R. H. Bow, C.E., Mr. Andrew Pringle, Mr. Thomas Bolas, Mr. Chapman Jones, Mr. George Davison, Mr. C. H. Bothamley, Mr. Thomas Bedding, Mr. W. E. Debenham, Mr. G. Watmough Webster, Sir H. Trueman Wood, Mr. W. B. Bolton, Dr. R. L. Maddox, Mr. B. J. Sayce, Mr. E. W. Foxlee, Canon Beechey, and about 150 other well-known writers and photographic experimentalists. The information contained in the section devoted to formulæ has been revised and brought up to date.

The volume is enriched with an example of collotype printing by Messrs. Morgan & Kidd, a specimen of Mr. Henry Sutton's half-tone process, one of Messrs. Waterlow's process, and three Meisenbach reproductions of negatives by Messrs. H. M. Hastings, J. B. B. Wellington, and E. Woodward.

A TELESCOPIC FOCUSSING FINDER.

Since the system of focussing the image in the camera by means of a pocket telescope was brought before the public at the first, or Derby, meeting of the Photographic Convention in 1886, nothing has been said about it in these pages; but, as queries have of late been coming to us concerning it, we think it well to revert once more to the topic. For the benefit of the numerous body who have adopted, as amateurs, the practice of photography since the date mentioned, it may be well that we commence what we have to say by recapitulating the general nature of the system and its special advantages over the ordinary means of focussing, at least under special circumstances.

These circumstances are those which when employing a small or hand camera find their analogue in one of the duplex or twin type, that in which there are actually two cameras conjoined, the lenses of both being similar and the bodies being so arranged that both are amenable to one rack and pinion, the one containing the ground-glass focussing screen, while in the other there is the sensitive plate exposed to the view, all save the protecting shutter, which, when the subject is found to be properly arranged and in focus on the ground glass, instantly flies open and closes again upon "pressing the button," or squeezing the pneumatic ball. This system, however admirable it may be when applied to small or hand cameras, is quite impracticable for those of larger dimensions, say from whole-plate to 12 × 10 and upwards.

In the system now under notice the camera has affixed to it, either at the top or along one side, a pocket telescope, the object-glass of which is of the same focus as the lens of the camera, and it is so adjusted, by means to be presently described, that when taken from the pocket and put in position on the camera it shall, upon racking the camera in or out until a sharp image is seen in the telescope, ensure most infallibly the absolute sharpness of the scene on the sensitive plate in the camera, and the equal certainty of the object visible in the little telescope eventually being found in the centre of the plate when, after exposure, the developer has been applied. The foregoing, in general terms, is the nature of the system; its advantages consist in keeping the object to be taken under constant surveillance from the moment of inserting the dark slide and withdrawing its shutter to the final squeezing of the pneumatic ball.

The object-glass of the telescopic focussing finder should be identical in focus with that of the photographic lens employed. Those whose means are limited will be glad to know that a really high-class telescope is not by any means necessary, as for this purpose we have found one of the cheap foreign ones serve quite well. What is of importance is the identity of its focus with that of the photographic lens. Once this is secured, the rest is easy enough. All that is then required is to attach the end in which the object-glass is contained to the front of the camera and the eyepiece end to the back, having previously taken care to open out one of the jackets in which *any* of the telescope tubes run, in order that, when operating the rack of the camera, the other may slide easily and smoothly without any drag. The details of fixing the telescope are these:—Place the outer end on the camera front at any convenient place, and fix it by any suitable means. It may project beyond the photographic lens or not, this being of no consequence so long as, when fixed, it cannot afterwards be slidden backwards or forwards. We do so by a pin, driven into the woodwork, which projects about a quarter of an inch, and fits into a hole drilled into the main or largest tube of the telescope body. Now focus on the centre of the screen, with the greatest care any object situated within a moderate distance, not one so far away that "everything is in focus." This is done on the ground glass of the camera, and by the camera lens. Next direct the focussing telescope to the same object that was focussed, and, by sliding in or out the still free or eyepiece end, see that this

object is also sharp, and then fix the eye tube to the camera. After this the focussing screen of the camera may be practically discarded, for no further adjustment will again be necessary.

For those who practise photographing of yachts or that of military manœuvres—or, in short, of any of those numerous subjects in which there are objects in motion, and which are constantly changing places, and getting out of focus when a lens with a large working aperture is employed—this system is one that can be very strongly recommended; for, with a plate *in situ*, the eye at the telescope, the right hand at the focussing rack, and the left hand grasping the pressure ball, the subject can be watched and followed until the fitting moment, when a squeeze by the left hand gives the instantaneous exposure.

But it may be said, "This is well enough for a camera having only one lens; how will it apply when one desires to supplant for some special subject the, say, eighteen or twenty-inch focus lens by one of a shorter focus, such as eight, ten, or twelve inches working at equally large or proportionate apertures as the other?" This, too, can be done, but it must form the subject of another article.

LOCAL REDUCTION OF NEGATIVES.

Our remarks on this subject at the close of an article on "Exposure and Density" a fortnight ago have elicited some correspondence to which we take this opportunity of replying generally. One suggestion is made to the effect that local treatment during development, or, in other words, development by means of a brush, is preferable to any after-manipulation; while other correspondents recount their want of success with the methods we mentioned for the latter purpose.

With regard to the first suggestion, we must say without hesitation that we cannot agree with the writer. Valuable as brush development may be, and undoubtedly is, under certain conditions and circumstances, we consider it totally unsuited for the special class of cases to which we alluded. Where a small portion of a negative is found to suffer from under-exposure and to be backward in development or weak in detail, it is admissible to wash off the developer and to reapply it to the defective portion with a brush or other similar means. But where only a small part of the image is fully or over-exposed, and the remainder probably regains the full strength of the developer, as in the case of a feebly lighted interior, the use of the brush becomes in the highest degree inconvenient, if not impossible.

Besides, the use of the brush in this manner requires the greatest judgment and a high degree of skill in order to ensure success, and to apply these adequately in the dim light of the dark room and upon an unfixed negative is to still further handicap the chance of securing a satisfactory result. Where the task before the operator is merely to coax out a little more detail in a shadow, or to strengthen that which already exists, to improve, in fact, a negative the major portion of which is already tolerably satisfactory, it may be undertaken at any rate without the risk of doing any great harm; but under any other conditions it is scarcely possible to hope to achieve any great success.

With the after-treatment, however, the case is altered, for not only is it possible with the fixed negative to judge pretty accurately the amount of modification necessary, but the operator is able to perform the work in a careful and leisurely manner and in a good light; and further, if he be so inclined, he may study the effect produced as the work proceeds by means of trial prints, and so avoid overdoing the treatment.

We strongly suspect that the latter is the rock upon which most of the unsuccessful workers have come to grief, for, unless carefully performed, the process of reduction may end in more harm than good. The effect produced upon the image is, to the eye, comparatively slight after a considerable amount of work, though when it comes to printing—and this is especially the case in the half-shades—the result is not unfrequently startling, showing itself in dark patches or blotches as if the image in places had been almost eaten away. For instance, in dealing with the over-exposed window of an interior which, if very dense from over-exposure or "halation" naturally requires a good deal of working, the tendency generally is to so encroach upon the contiguous portions that, when the window itself is reduced to proper printing strength, it is found in the positive to be surrounded by a dark halo that produces an even worse effect than the original.

The beginner in this style of dodging should always bear in mind the necessity of proceeding slowly and carefully, remembering that, though insufficient treatment at the first attempt can always be supplemented, over-reduction is quite beyond remedy. Therefore the first counsel we would give is to apply only a little work at first, and then very carefully study the effect, or, better still, try a print. In this manner, not only is excessive reduction generally guarded against, but any irregularity or inequality of the work can be detected before it has gone too far. Such irregularity is most likely to occur in such cases as that we have quoted. Where a good deal of work has to be applied to a restricted area, for it is difficult to avoid encroaching upon the surrounding parts more or less, and these will show the reduction proportionately more without requiring it, than the denser portion to which it is desired to confine it. The best means of minimising this danger will be noted in connexion with the different processes as we proceed.

The first plan we shall speak of, because the one most generally employed, though not the oldest in a chronological sense, is one of which Mr. W. Brooks was, if not the introducer, at least one of the earliest exponents. This consists in rubbing down the over-dense portions with alcohol, applied by means of a tuft or pad of cotton-wool or similar material. Some operators prefer to use the bare finger, and, in the case of the fair sex, we dare say the soft skin and delicate touch would answer every purpose; but for ourselves, though not specially "horny-handed," we prefer the artificial rubber.

The first point of importance is the strength of the alcohol, which should be as free from water as possible in order to avoid swelling or softening of the gelatine film, which will inevitably occur if a weak sample be used. Ordinary methylated spirit of fairly good quality is generally of specific gravity about ·827, and this answers quite well, though how the new "mineralised" spirit will behave when applied to this purpose we are unable to say from actual trial. The presence of the small proportion of mineral naphtha is, however, not likely to greatly affect the result. The rectified spirit of the pharmacopœia is too weak to be safely used; therefore, if methylated spirit of the right strength cannot be obtained, it will be better to employ pure alcohol of not higher strength than ·820. Before commencing the reduction it is, of course, absolutely necessary to see that the film is perfectly dry, to ensure which condition it is well to warm the negative, and allow it to cool again just before use.

In applying the spirit, the cotton-wool or other material,

which should also be carefully dried, must be well saturated, but not sufficiently to allow a great quantity of the liquid to flow over the film in rubbing. What is wanted is just sufficient to comfortably lubricate the surface and allow the rubber to move smoothly. When this is attended to, and aqueous moisture is not present, considerable pressure may be applied without danger of injury to the film; but it is preferable not to use too much force, but to proceed gradually. The character of the reduction to be effected will also modify to some extent the method of friction, broad, gentle strokes being required for a wide expanse of sky or general lowering of density, and shorter, sharper strokes where the space to be worked upon is more limited.

The most difficult subjects to treat are portraits, so far at least as the face is concerned, for, if too heavy pressure be applied or too much work done, the deposit will be rendered transparent, and the high lights degraded in the print, a result being produced similar to that obtained by exposing the picture to light after it leaves the printing frame. In cases of harsh contrast in portraiture, it is a good plan to employ an artist's chamois leather stump, though it requires some little practice to handle it successfully. This is useful also in softening the lights of drapery and for similar purposes, though for portraits generally we prefer the process that will be next described, with powdered pumice instead of spirit.

Very often the sky of a landscape negative will show traces of clouds, which are, however, too dense to print out with the landscape unless some means be adopted of shading the latter. In such instances the alcoholic method of reduction answers admirably, the rubber being applied with long, sweeping strokes, following rather closely the sky-line. Where the objects outlined against the sky are distant and softened by atmosphere, it will be the better plan not approach too closely to the line, but to leave a narrow margin of sky untouched, or nearly so, or the outline of sky and landscape may be partially lost. In the case of near objects, cutting the sky-line with considerable contrast, whether trees, buildings, or other objects, the opposite treatment may be followed, the reduction being allowed to extend slightly over the boundary and into the landscape, though not sufficiently to do more than soften the sky-line.

When the desired effect has been obtained, the whole surface of the negative should be flooded with spirit, and gently washed over with a broad camel's-hair brush or loose tuft of cotton-wool, in order to remove the surface traces of the local friction.

An older, and for some purposes a better, method of procedure depends upon the use of finely powdered pumice-stone, cuttle-fish bone, or other abrasive applied to the dry film, instead of alcohol. This plan was introduced to the world some years ago at a meeting of the Photographic Club by Mr. F. Barber, of Sheffield, and caused some surprise by its novelty. Many who tried it at the time failed signally, but probably from two causes—first, want of care in seeing that the film was dry at the time of use; and, secondly, the use of too coarse an abrasive.

For this process it is even more necessary than in the former that the film should be perfectly dry, otherwise it is either badly scratched by the powder or else the latter adheres to it or becomes embedded in it. The same result occurs with films from which the fixing salt has not been thoroughly eliminated; hence, before proceeding to apply the powder process, it is well to soak the negative in water for a few minutes, then gently clean its surface with a tuft of wet cotton-wool and redry it, finishing off with heat to ensure the entire absence of moisture.

Whatever the powder employed may be, it is difficult to obtain it in ordinary commerce in a sufficiently fine state of comminution. The powdered pumice obtainable at the chemists' is too gritty, and utterly unfit for use in its crude state; but, if a small quantity of it be carefully worked in a glass or other mortar for a few minutes, and then sifted through fine muslin, it will assume the form of an almost impalpable powder, without, however, losing its abrasive power. This is the condition in which to use it; and, though on first trial it may seem to produce little or no effect, it will be found on persevering that its action is far greater than at first appears. This should be applied with the bare finger with firm but gentle pressure, the finger being sensitive enough to detect instantly any coarse or gritty particles which might cause damage to the film. The method of application is otherwise much the same as in the case of alcohol, though we think the effect is superior, especially in the case of portraiture and similar delicate work. It has the additional advantage of leaving the surface of the film in an admirable condition for retouching, if that be necessary.

For fine work the chamois leather stump may be used, as in the case of spirit, though it scarcely behaves so efficiently, as the powder seems to bury itself in the leather and lose its cutting power. As a substitute we prefer to use the fine "ink eraser" sold in the form of sticks by Faber & Co. and others. This, if worked to a fine point, answers splendidly on the dry films, being both fine and hard, and very delicate work may be done by its aid.

With regard to chemical methods of reduction, though we have had no practical experience of it for local purposes, we are informed that very good work can be done with the mixed solution of hypo and ferridcyanide of potassium. One method of using it is to thicken the solution with gum or glycerine, and apply it in that state to the parts to be reduced, softening or vignetting the edges by means of the brush. The action requires to be closely watched, and the plate plunged into a vessel of water provided for the purpose the instant the effect is obtained.

Another operator holds the negative in an inclined position in a flat dish containing a very weak solution of the same ingredients, having at the same time by his side a vessel of water into which to dip the plate. Repeated washes of the reducing solution are applied with the brush, alternated with dips into the water until the necessary reduction has taken place. This plan is more especially suited for skies or other broad expanses of subject, but may be combined with the foregoing for general work.

For totally eliminating portions of a picture, or for clearing the skies of transparencies, nothing answers better than a solution of cupric chloride of moderate strength, and thickened with gum or glycerine. This quickly converts the silver image into chloride, and a dip into the fixing bath as rapidly removes it.

THE EXCISE AND METHYLATED SPIRIT.

It will be remembered that, a few months back, we explained the procedure to be gone through in order to obtain methylated spirit of the old kind—that is, free from mineral naphtha—provided the purchaser took as a minimum quantity five gallons at a time. Also that bonds, as security that the spirit

was not used for illegal purposes, were no longer necessary Since then, however, a further concession has been made by the Excise department, so that smaller consumers—such as amateur photographers—may now purchase as little as a gallon at a time. This fact has recently been brought before one of the metropolitan Societies, but it is one of such interest to most workers on a small scale that it should receive greater prominence than is given it in the necessarily brief reports of society meetings.

The form still to be gone through is similar to that given on page 561, *ante*. In the case, say, of the metropolis, a written application is sent to the Excise Department, Inland Revenue, Somerset House, for a licence or permit. In due course, a representative will call on the applicant and learn the purpose for which the spirit is wanted, the probable consumption per annum, where it will be stored, and, presumably, to ascertain that it is not likely to be employed for illicit purposes, &c., also to know the quantity that would be purchased at a time. In a few days, the applicant will be furnished by the Department with the requisite permit and blank forms of "Requisitions for Methylated Spirit." One of these is filled up and forwarded to the nearest methylator, who will then supply the quantity specified. In the case of Mr. Medland, who brought the subject before the London and Provincial Association, this was fixed at one gallon. For all this no charge whatever is made. It must be fully understood that the spirit can only be had direct from a methylator, as the ordinary licensed dealer is not permitted to supply unnaphthalised spirit under any conditions whatever.

It will now be seen that the new regulation as to methylating, which did for a time cause some inconvenience, is now really not such a serious one to experimentalists and small workers as at one time it was thought it would prove. In fact, the authorities evidently are prepared to deal liberally with those who require the spirit for legitimate purposes. This is no more than we suspected would be the case when writing on the subject last year when the fresh regulation was first made. While on the topic, we will say a little more on the subject of methylated spirit.

Most experimentalists are aware that spirit methylated under the new regulation is quite unfitted for several photographic purposes, as, indeed, it is for many others for which the old kind can be employed. Furthermore, alcohol containing even wood naphtha alone cannot be used in some processes, as the presence of the latter would be fatal to the result. In this respect some of our Continental neighbours possess advantages over us, inasmuch as, under certain conditions, they have the privilege of obtaining duty-free spirit without the addition of wood naphtha, but having as a substitute a small proportion of other material.

For many years alcohol was sold duty-free as methylated spirit, provided it contained ten per cent. of wood naphtha. Eventually it was found that such spirit, nauseous as it was rendered by the naphtha, was, diluted with water, being largely used as a potable spirit; also that it was being used as an adulterant of duty-paid spirits, and consequently, it is said, the revenue was thereby being defrauded to a considerable extent. It was this that led to the introduction of the regulation according to which, in addition to the ten per cent. of wood naphtha, three-eighths of one per cent. by volume of mineral naphtha has now to be added. Now, this small proportion of mineral naphtha would not be harmful for most purposes for which the spirit is employed in photography if it were one of the refined variety. But the naphtha has to receive the approval of the Excise authorities, and they insist on the crude article being used, as no other will fulfil the desired end. The same applies to the wood naphtha. That, too, must be approved of by them; and this will not be the case unless it be in a very crude form. So rigid are the authorities on this subject that the methylating always has to be done under the supervision of the exciseman, and the stock of naphthas are kept under his seal.

When methylated spirit was first allowed to be sold, now many years ago, it could be obtained of a much better quality than now. Then, so long as the spirit contained the prescribed proportion of naphtha, the authorities were not so very particular as to the kind used; hence they permitted a somewhat highly rectified pyroxilic spirit to be employed, if desirable. They also allowed a methylated absolute alcohol having a specific gravity of about ·805, containing a somewhat highly rectified naphtha to be sold. As, however, it was soon found that these superior kinds of spirit were being used for purposes for which the authorities never intended—manufacture of tinctures and the like—a fresh regulation was made by which their sale was prohibited.

Reference was made just now to the fact that some countries possess great advantages over England in the matter of methylated spirit—Germany, for example. There the methylated spirit contains but five per cent. of wood naphtha, instead of ten, as the law requires in this country. The use of a more highly rectified naphtha is also permitted. Indeed, we have seen some samples of German methylated spirit that, if it could be obtained here, would doubtless be largely used by unscrupulous persons as an adulterant of potable spirits and other illicit purposes. In Germany also, for some purposes in which wood naphtha would be prejudicial—such as in the manufacture of some coloured varnishes, percussion caps, &c.—spirit is allowed to be sold "methylated" with half per cent. of turpentine and a quarter per cent. of animal oil. Such a spirit would be very advantageous for many purposes if permitted here.

What a Telescope may Do.—From the performances of the Lick Telescope we are able to form some idea of the possibilities of instrumental discovery. This powerful equatorial will not properly divide a double star when the individual stars of the compound subtend an arc of a tenth of a second; hence, to show a star of ° magnitude, an object-glass with a diameter seven times as large as the Lick Telescope would be needed. Further, granted a star of the first magnitude, with a photosphere similar in brightness to our sun, we are told that ten times the Lick diameter would be required.

The New Big Telescope.—Professor G. E. Hale, Director of the Yerkes Observatory of the University of Chicago, has recently published authentic particulars of the new telescope which is to surpass all existing instruments. A decision is shortly to be made, the conditions being that the new telescope is to be the biggest in the world. The learned Professor states that probably from forty to forty-five inches will be the limit of the aperture. At present there exists a pair of forty-inch discs ready made, "but it is not altogether certain that they will be considered large enough by the liberal donor."

Optical Lantern Diagrams.—An excellent method of rapidly drawing diagrams for the lantern consists in using an ordinary blacklead pencil upon a surface, to which is given a tooth by the use of ground glass. A recent invention, however, contains the germ o

an idea, which may eventually prove to give a still better method, by obviating the necessity of frequent sharpening of the pencil. Acting upon a discovery of Major von Sillich, of Meiningen, who found that a pencil made of metallic aluminium gave a legible mark on a slate, a German firm are about to put in the market a pencil made upon the lines thus indicated. They are five millimetres thick and fourteen long, and for the purpose we suggest should, we feel sure, be thoroughly effective.

Changing Big Lenses.—When a camera objective exceeds three or four inches in diameter it is, as every photographer knows, no inconsiderable task to take it from the camera and replace it by another of somewhat similar size. What, then, must the task be when the lens is a yard in diameter, and heavy enough of itself to task the power of several men to lift? We have a very interesting answer to this query from the pen of Professor Barnard, who gives us some details of his experience with the great Californian instrument just referred to. When micrometric work only is in hand, five minutes suffice to prepare this instrument; but, when photography is to be undertaken, ten minutes are needed. This difference is caused by the need of the correcting lens being placed *in situ* to allow for the difference between visual and actinic foci. When the spectroscope is to be used, half an hour is needed to get the prisms in due working order.

"Press the Button" on a Large Scale.—This quotation is so hackneyed as to be familiar in our mouths as household words, but the latest suggestion is on such a gigantic scale as almost to take one's breath away. Already details of the observatory proper that will be needed for the new Chicago telescope are being made public, and foremost in interest to photographers among these are those to which this expression will apply. To return to our camera simile, the difficulty of manipulating those of large size is, as we know, very great, and to scrutinise that portion of image situated at the top of the ground glass is very difficult. With a camera a dozen or two yards long, it is evident that these difficulties would be increased a thousandfold. When "tilting" (for that is the exact equivalent of the "declination"), a ladder is required, and, as this needs moving to follow the stars as they appear to recede, special contrivances, in the shape of "observing chairs," are used. But in the proposed new telescope this difficulty will be oviated: "Press the button," and the whole large floor of the observatory will shift its place, and, with the observer standing at the telescope upon it, move up or down, revolve, &c., till he is brought into the exact position with regard to the instrument that is most convenient to him.

Scientific Principles Applied to Negative Washing.—"Place the negatives under a tap and allow the water to run for some time;" such is the almost universally adopted recommendation. But, as a matter of fact, we have in previous articles shown some of the disadvantages of the process, which is by no means the simple matter that it at first sight appears. Before the Royal Society a paper was recently read which has a very distinct bearing on this subject. The rapidity of flow and other conditions governing the mixing of two liquids when one of them enters the other with some velocity was under consideration. We need not refer to the details of the paper further than to say that one of the liquids was made coloured, in order to show the actual commingling, its extent, and peculiarities. The actual deductions drawn are all that are needed for our instruction, and they were as follows:—"The tendency to instability increases as the velocity of the liquid, the radius of the tube" (in our case the "tap"), "and the coefficient of sliding friction increase, but diminishes as the viscosity increases. The tendency to instability increases as the wave-length of the disturbance increases." This language may perhaps be considered ultra-scientific; but the difficulty disappears when we find that "instability" means practically the tendency of the liquids to mix. It must not be forgotten also that the question of osmose plays an important part in the elimination of soluble salts out of the film.

PHOTOGRAPHING STAINED-GLASS WINDOWS.

For many years the photographing of stained-glass windows was looked upon by glass-stainers and others as an operation which seldom yielded satisfactory results.

The introduction of isochromatic plates, however, has placed in the hands of photographers a new power, and now, with proper arrangements and precautions against halation, very excellent results are obtained.

At the outset, work of this kind requires a considerable amount of forethought. On no account should it be undertaken without first studying well all the troubles and difficulties to be met with—indeed, perhaps there is no class of photography in which it is so necessary to visit beforehand the scene of operations, so as to judge of the various colours to be dealt with and to arrange for numerous other items, as when undertaking stained-glass work; for it very frequently happens that in many cases the windows are in such situations as to render the placing of a camera in a suitable position to copy them a work of the greatest difficulty, and, notwithstanding the benefit of a swing-back to the camera, it frequently happens that special arrangements in the way of rigging up a platform require to be made. In some cases the front of a back or side gallery will be found to lend themselves to the work, but there are instances in which difficulties will be met with that require special arrangements for the standpoint of the camera. Another trouble will be found in the shape of some pulpit or chandelier interrupting the view and so spoiling the design of the window, and in many cases this will be found so aggravated as to be almost insurmountable. In some instances, however, I have overcome the presence of chandeliers by working from a point just at their side, for it is seldom practicable to have them removed just for the occasion. This kind of difficulty often taxes the skill and patience of an operator to a very great extent. In cases where special platforms have to be fitted up, they should be very rigid in their character—nothing in the shape of a makeshift arrangement ought for a moment to be entertained, for when such is employed the attempt will certainly end in failure, if indeed not actual accident or damage to life, limb, or apparatus. Photographers are not chimney-sweeps or steeple-jacks, and, when working on platforms specially erected, they should have the utmost confidence in the stability of the structure; for in this work, if it is worth doing, it is worth doing well. The erection of a suitable platform to work from need not cost an exorbitant sum—such can generally be put together by practical workmen for the occasion in a few hours, and as easily removed.

I have also known cases where more than ordinary difficulties were met with in the way of a chandelier, that the operation of photographing the window had to be delayed until a period of cleansing and renovation came round. When such takes place in a church or other edifice, then comes the photographer's opportunity; at such times, chandeliers are almost sure to be dealt with, and in many instances are taken down for cleaning.

Once in possession, however, of a suitable standpoint to work from, an operator has certainly overcome a great difficulty, and, in a sense, may be said to be master of the situation.

I have said that this work should never be undertaken without a considerable amount of forethought. This is especially necessary in the matter of becoming acquainted with the various colours to be photographed, as well as carefully studying the proper time of day to make the exposure, for in the matter of lighting much will depend in the way of success. Hardly two windows will be found to require the same time of day. As to the selection of diffused or sunlight for the work, I have been forced from experience to decide that sunlight is far and away ahead of diffused light for this work. For interiors, doubtless diffused light is *par excellence* the proper mode of lighting to employ, but the work we are considering must not be classed with interior work: it stands upon a different footing entirely. In nearly all stained-glass windows there will be found portions of deep ruby and orange-coloured glass, and these portions are just about as fine specimens of non-actinic colours as it is possible to acquire. Quite recently I have come across a sample of this ruby, which, to my mind, was very instructive, and I took the opportunity, when photographing the window which contained it, to expose, alongside of an isochromatic plate, an ordinary bromide plate. In the case of the latter, notwithstanding that an exposure of one hour and a half was given with a stop equal to about *f*-32, I failed, on development of the plate, to get any results from this particular specimen of glass. Of course, with the isochromatic plate I employed, the result was quite different, but I was so impressed with the results in this case that I afterwards made a point of specially inquiring from the glass-stainers who erected the window what particular kind of glass this was. I learned it was ruby flashed on a yellow glass. Now, I mention this just with a view of showing how necessary it is to employ

the greatest possible amount of illumination, so as to impress even a colour-sensitive plate. Sunlight in such instances is absolutely necessary. Doubtless there are many other instances in which windows do not contain such non-actinic specimens of glass where a bright diffused light will yield good results, but for cases where such non-actinic colours have to be dealt with diffused light is out of the question.

In selecting sunlight for the work, such time of the day must be selected when the sun is not shining direct into the window, but when such is illuminated by the sun throwing oblique rays upon the glass; this may be from either side. Another precaution very necessary is the selection of such a time as when the sun is not too far to the side, so as to throw any surface light on the inside of the window, or, in other words, the darker the interior of the edifice is the better results will be obtained. A previous inspection of the building when the sun is shining will enable an operator to know to a minute or so just when it clears the front of the window, and when such takes place, in my opinion, that is the best time to expose.

As to the proper plates to use, an intelligent worker nowadays would never dream for a moment of undertaking such work without the aid of colour-sensitive plates. If there are still any sceptics who do not believe in the undoubted advantage of isochromatic over ordinary bromide plates for such work, all I can say is, they have yet something to learn. With the plates I have mentioned I have obtained most excellent results from windows where the predominating colours were from pale yellow down through orange and olive-green to deep ruby, each and all of which are well represented in the negative, and this without the aid of any screen to the lens. Under similar conditions an ordinary bromide plate was absolutely useless.

An operator, who for the first time undertakes this work, say, with the view of exposing a 12 × 10 plate on a fair-sized window, will very likely get a staggerer when he comes to view the image for the first time on his ground glass. If he is at any distance from the window, even with a lens of twenty-two-inch focus, he will feel somewhat disappointed at the smallness of his image; therefore long-focus lenses are frequently a necessity, and should be provided. I have done this kind of work with symmetrical and single lenses, and, notwithstanding all that is urged against the latter being used for architectural subjects, I decidedly prefer to use them at all times, even for this work.

In my opinion another important point is the using of as large a stop as possible when exposing the plate. Some workers may imagine that equally good, if not better results could be obtained by using a very small stop, and giving a proportionately longer exposure, but here we have just a case in point, where the utmost amount of light ought to be conveyed to the plate. My experience clearly shows that the larger the stop the more harmonious the results. Nor is the reason far to seek. When it is considered that we are dealing with non-actinic colours it is at once apparent that to cut off the illumination is wrong in principle. Some of my best results have been obtained with an exposure of about fifteen minutes, whilst with the lens stopped further down, and giving under exactly otherwise similar conditions an exposure of over an hour, I failed to get anything like the same range of tints represented in the negative.

I have often been questioned about the best way to prevent halation. From time to time we hear and read of ingenious devices for preventing this trouble, and quite recently I have had shown to me what some considered wonderful results when photographing interiors—results in which halation was reduced to a minimum by the employment of a new plate, said to be proof against halation; but so long as I can photograph stained-glass windows with the aid of isochromatic plates that yield me colour, correct impressions, and which do not show the faintest sign of halation or dispersion of light, I cannot see the economy of using a plate the cost of which is so far in excess of the other or isochromatic plate.

Without entering into the theory of halation, or what on strictly theoretical grounds ought to be the proper substance in so far as its refractive index, being similar to that of the glass plate is concerned, I may just state that in my practice I am never troubled with halation, and I am certain, were the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY to adopt the good old plan of coating the back of their isochromatic plates (when doing any work likely to show halation) with a cream made by dissolving asphaltum in benzole, we would hear less about this evil.

Whenever it falls to my lot to have to undertake work of the kind I light my pipe and go in search of a common tar barrel, they are not difficult to find in most large towns, and a small lump is always to be had lying about. In a suitable bottle small portions are placed and common benzole poured on till the asphaltum is dissolved, and it assumes the consistency of a thick cream. The night before the plates are required they are subjected to a coating on the back, and then I place over the asphaltum when somewhat set a sheet of brown paper and press this on to the coating of tar. The cells are filled after an hour or two and the plates are ready for exposure.

Some workers have objected to the use of asphaltum on account of it being messy and somewhat difficult to remove *before* development, but with me I never bother about removing it *before* development; I invariably remove it *after* the plate is developed and fixed, and finally washed. The removal never gives me a thought, nor does its presence on the plate during development in any way affect the success or prove injurious. There may be other methods of preventing halation, but I can confidently recommend the one I have described. When used in conjunction with isochromatic plates it is entirely absent.

T. N. ARMSTRONG.

CONTINENTAL NOTES AND NEWS.

Niepce, not Daguerre.—A proposal to erect a new monument to Daguerre in his native village of Brie-sur-Marne has moved M. Leon Vidal, the editor of *Le Moniteur*, to remark that, but for Niepce, there would have been no Daguerre—photographically speaking, of course. Niepce was really the inventor of photography. Daguerre contributed his brick to the edifice, no doubt; but it is often forgotten that, without Niepce, photography would not have been known, and that in that case Daguerre would not have been the inventor of the Daguerreotype. Niepce was the real father of photography. It is an error to suppose also that Daguerre discovered the development of the latent image, inasmuch as a latent image existed in the bitumen process, being developed by dissolution of the unaltered bitumen. Development of the image on silvered copper was a different species of reaction, upon which modern negative processes are based; and, without attempting to minimise the importance of this discovery of Daguerre, M. Vidal concludes by pointing out that he followed Niepce. M. Vidal does service in the cause of historical truth by once more insisting on the relative positions occupied by these two men in the field of photographic discovery. Undoubtedly a great deal of the credit which belongs to Niepce is often given to Daguerre.

Converting Blue Prints into Black Prints.—The *Revue de Chimie Industrielle* says that the prints should be first passed through water acidulated with nitric acid, and thence into—

Carbonate of soda	50 grammes,
Water	1 litre.

In this the picture is changed to an orange tone, when it is removed and placed in—

Gallic acid	50 grammes,
Water	1 litre,

being subsequently washed in water acidulated with HCl.

Recovering Fogged Plates.—In order to render plates which have been accidentally fogged, or have by mistake received two exposures, or are known to have been over-exposed, in a fit condition to be used again, M. Rossignol recommends their immersion in a bath consisting of—

Bromine water	50 c.c.
Tincture of iodine	20 „
Distilled water	1 litre.

After immersion for two or three minutes, the plate is washed and dried. M. Rossignol says that, if the plate has only been partially exposed, it should be exposed to lamplight in order to make the fog impression uniform.

An Intensifier for Gelatine Negatives.—In the *Deutsche Photographen Zeitung*, M. Kirchoff gives the following formula for an intensifier. To a solution consisting of—

Bichloride of mercury	10 grammes,
Water	800 c.c.,

twenty-five grammes of iodide of potassium are added until the red precipitate is dissolved, one gramme of hypo being then introduced. For use, the solution is diluted with its own volume of water, and

intensification is allowed to proceed until the shadows of the negative are of a yellowish-green. The intensification is not apparent until the negative is dry.

Printing on Silk and other Fabrics. — *Apropos* of M Villain's recently published method of photo-dyeing, Mons. A. D. Lavroff writes to the *Paris Photographe*, detailing his method of printing on silk, cotton, &c. He prepares the following mixture:—

Tartaric acid	1 gramme.
Common sugar	10 grammes.
Boiling water	100 c.c.

This is boiled for a minute, and ·5 grammes of borax added, the mixture left for six hours, the clear liquid decanted, 4 grammes of common salt added, and the solution filtered. The fabric is coated with the solution, and when dry is sensitised, dried, printed, toned, &c., as usual.

The Colour of the Sky.—According to a contemporary, M. A. Crova has made a series of researches on the diffusion of light by the sky, and has come to the following conclusions:—The blue colour of the sky reaches its maximum intensity in December, January, March, and the minimum in July, August, and November. The maximum effect appears in the morning, and the minimum at the time of the greatest heat of the day. The intensity of the blue colour is at its maximum in winter, and at its minimum in summer.

THE AMIDOL DEVELOPER.

[American Amateur Photographer.]

A FEW experiments conducted with this new developing agent demonstrates that it is to have an important place in the many developing chemicals now before the public, and to possess some peculiarities that may identify it with the wet-plate developer.

A sample ounce of the chemical was sent to me from England. I found it to resemble somewhat hydroquinone crystals in shape, but darker, similar to the colour of steel. The directions sent with the package explained that it was advisable to dissolve the sodium sulphite first, then the amidol. Accordingly the following proportions were carried out:—

Water	8 ounces.
Sodium sulphite (crystals), Merck's C.P.	800 grains.
Amidol	80 „

The water used was from an artesian well. The above forms the stock solution, and is too powerful ordinarily. It must be diluted by three times its bulk with water. Half an ounce of the above is added to one and a half ounces of water to form a normal developer. When freshly mixed it is colourless, like water, and gradually becomes yellow, and later a dark yellow. The first batch of stock solution that was mixed became milky and turbid after an hour, and in the course of five hours quite a precipitate settled at the bottom of the graduate, which was dried on blotting paper and had the colour of steel. This precipitate did not seem to weaken the developing power of the developer; but it was not what one would expect. I am convinced it must have been due to the water, which probably contained some lime. However, the developer mixed as described was poured over an 11 × 14 sheet of Eastman's slow bromide paper, which had been liberally exposed to daylight behind a cardboard drawing, and to the astonishment of all, developed up in about five seconds to full density. The blacks were of a delicate, velvety colour, while the whites were remarkably clear and free from any sort of veil or stain. Sheet after sheet was rapidly developed in the same solution (eight ounces) until the eighth or ninth, when it began to work slower, and the blacks were not as brilliant. But a dozen good bromide prints of 11 × 14 were obtained with only twenty grains of amidol. It apparently made no difference whether a long or short exposure had been given; the development began as rapidly and acted uniformly on every portion of the film that had been exposed to the light.

Desiring to secure, if possible, a solution that would show no precipitate, a second batch of the stock solution was prepared as above with the exception that distilled water was substituted for the artesian well water. An absolutely colourless solution was the result. There was no precipitate, and after standing in a graduate covered by a sheet of glass for twenty-four hours, the colour became a faint yellow, which became slightly deeper in two or three days. The experiment showed conclusively that rain or distilled water should be used. With six grains of amidol in this distilled water developer, I developed in a short time one dozen 3¼ × 4 films, one after the other (time and shutter exposures), and obtained very clear negatives, even though in some cases the film was in the developer for twenty minutes. I next tried a fresh solution, of similar strength to the foregoing, on two Cramer isochromatic rapid plates, having had quick shutter exposures. After pouring on the developer, the image rapidly appeared in three or four seconds, and in three minutes the negative had reached ample density and was done. A second plate came up nearly as rapid: both were excellent, clear negatives. The solution, after development, was saved. It was clear (with the exception of particles of film that had become detached during development), and was used the next day in developing half a dozen 4 × 5 bromide prints.

The marked difference amidol has over other developing agents, is that it is quite soluble in cold water, can only be used with neutral sodium sulphite, in place of an alkali, and refuses to develop in an alkaline solution. It is distinctly an acid developing agent, and when rightly understood will be a great help in the production of line negatives and lantern slides. To test the developing power of amidol by itself, a solution was made by dissolving twenty grains in four ounces of water. This was poured on by a properly timed plate and kept on for over five minutes. In that time no trace of an image appeared. Next, ten grains of carbonate of potash were added, and the development continued for three or four minutes more, but still no sign of an image appeared. The potash turned the solution from a colourless one to a deep handsome red. Having no sulphite of soda at hand, the experiment was not carried further.

At another time a separate solution of chemically pure neutral sodium sulphite in distilled water was made (strength 100 grains to the ounce), also a separate solution of amidol (twenty grains to two ounce of distilled water, equivalent to ten grains to the ounce). One-half of the amidol was taken (one ounce), to which was added half an ounce of distilled water. The ounce and a half pure amidol developer was then poured over a shutter-exposed isochromatic plate; after five minutes no trace of an image appeared. Testing the solution with blue litmus paper showed that it was acid. Next the experiment of adding to this apparently inert developer, a drachm at a time, and by half drachms, the sodium sulphite solution mentioned above was undertaken. First a drachm was added after three minutes; there was no sign of an image. Then two half-drachms went in; soon the image began to appear—developed out slowly, similar to plates in eikonogen weak in an alkali. The negative had good density and was finished in six or eight minutes. The solution was now tested with blue litmus paper, and showed an acid reaction, though not as strong as before the sulphite was added. Thus it was found that twenty-five grains of sodium sulphite to seven grains of amidol are necessary to set up a developing action, and that the addition of so much more (100 grains of sulphite to ten of amidol, as given in the formula) accounts for the rapidity with which a slightly diluted solution of that kind acts. The sodium sulphite may be regarded as the accelerator in the admidol developer—the same as the alkali carbonate of potash or ammonia is in the eiko or pyro developer. With the ounce and three-quarters of solution five 4 × 5 and two lantern slide-plates were developed, all being of extreme brilliancy and clearness; the high lights of the slides were clear glass. The colour of the developer was light yellow. On testing the standard solution (100 grains of sulphite to ten of amidol) with blue litmus paper there was apparently no change, showing, we think, that it requires that amount of sulphite to counterbalance the acidity of the amidol.

The other portion of the plain amidol solution changed very soon—in three-quarters of an hour—from being colourless to a deep red, but kept clear. At this writing it has not been tested as to its developing power when compared with a fresh solution, but it is likely that it will be as effective.

Amidol is very nearly as soluble in distilled water as pyro; hence it may be advisable to keep it in its crystal state until ready to use, then to mix up a small quantity and add gradually enough sodium sulphite (which may be kept in a stock solution) to produce a developing action. By varying the proportions of two, rapidity of development is to be regulated as well as the density of the image, while the tendency of the developer to veil the unacted upon portions of the film during prolonged development, is reduced to a minimum, and whether over-timed or under-timed, plates will come out always clear and brilliant. No bromide need be added if the proportion of sodium sulphite is lessened.

It will seem strange to many to consider sulphite as an accelerator in this developer, when heretofore it has been regarded as a retarder;

but when its action has been so clearly demonstrated, as outlined in the foregoing described experiments, there is no doubt about its function. Besides being an accelerator, it also serves to retard the supposed oxidation of the amidol.

The addition of sulphurous acid would probably be beneficial, as it would aid in preserving the developer, when standing, from oxidisation and keep it clear for a long time. The use of acid sulphites, it seems, is also allowable. The description in the patent curiously confirms the experiments I have mentioned as to the accelerating action of the sodium sulphite, and it may be possible by different modifications or additions to secure different colours or tones to negatives or positives.

F. C. Beach.

THE SIZE OF STOP TO USE.

[American Journal of Photography.]

So much has been written about "sharpness *versus* softness," and the like, that some apology is necessary for even referring to the subject again, and I should not do so but that, having expressed pretty decided views on the subject some three years or so ago, and having, after continual study of the subject since, had reason to modify these views considerably, I wish to have an opportunity of restating my opinion.

The views that I expressed when I wrote last on the subject were briefly that, in the case of a landscape, the principal object ought to be sharp, or nearly so, according to the taste of the artist, all reasoning tending to show that it ought to be as sharp as the best optical instruments could make it, but that objects nearer to or farther from the camera than this ought to be less sharp. My reasoning was that as, if in nature we look on what is the principal object of the landscape, objects nearer or farther look "out of focus," we ought to try to reproduce this effect in the negative.

Sharpness of the Principal Object.

In the first place as to the sharpness of the principal object. I am more inclined than ever to think that, in most cases at least, this ought to be as sharp as it can be made in the negative. I say in the negative, because I admit that a charming effect is produced by the softening or slight loss of definition that results from reproducing from a negative by certain processes. Thus, to me, the softness that there is in most pictures produced by intaglio copperplate photo-engraving is a totally different thing from the effect got by printing in silver, even on matt-surface paper or in platinotype, from an ill-defined negative. The one effect is beautiful, the other, generally at least, is not. It seems to me that those whose taste leads them to avoid absolute sharpness in any part of a picture would find it best to get the softness they want in the after-process of printing rather than in the negative. Mr. George Davison has described various ways of producing such softness from a negative in which the definition is quite sharp.

Even if it is decided to get softness or slight want of definition in all planes of a negative, it is to be borne in mind that this softness may differ in quality. Thus the softness got by admitting an appreciable quantity of spherical aberration is quite different from that got by putting the whole of the picture a little out of focus. The softness got by admitting a little spherical aberration is of a much more pleasing kind than that got by putting the image out of focus. The reason is that, in the former case the image may be said to consist of one of perfect definition; in the latter case there is nothing but lack of definition. It is for this reason that I have often stated that an optical *desideratum* is a landscape lens with an adjustment, whereby a *large quantity* of spherical aberration can be introduced at will, so that what softness is wanted may be introduced even when a small stop has to be used on account of nearness of foreground objects.

The Doctrine does not Hold Good.

Now, as to making the principal object the sharpest (strictly speaking, the most nearly sharp) in the picture, whether or not it be made absolutely sharp, I am afraid this is a doctrine that does not hold good. In the first place, many pictures have no principal object, or no object of which it can be said with any degree of confidence that it is the principal object. Much more important, however, is the following fact: If there be any object in the foreground, the least conspicuous, even if it is not an object of particular interest, and if any more distant object be made sharper than this, the effect is distinctly bad. In other words, it is necessary to focus for the nearest object that is in the least conspicuous, apart from whether it be the principal object or not, and it very seldom is the principal object.

Should the Distance be Out of Focus?

Now as to whether the rest of the view should be put distinctly out of focus or not. There can be only one object in putting the more distant parts of the landscape out of focus, and that is, to give an impression of distance, the thing in which photography most commonly fails. The question is, Does this leaving out of focus give the impression of distance, or does it not? I have no hesitation in answering that there are cases where it does, and that there are cases where it does not, but where the only effect of leaving the distance out of focus is a totally unnatural one. If this be granted, the natural question is, In what cases is it of advantage to leave the distance out of focus, in what cases should it be sharply focussed? To this, I am sorry to say, I can give no answer farther than that continual observation and experiment will educate the eye to be able to tell whether or not the idea of distance will or will not, in a particular case, be given by the use of a large stop. By experiment I mean the taking of two or more negatives of the same subject with stops of different sizes, no adjustment of focus being made between the exposures, and comparing the resulting pictures. This is a thing I strongly advise to those who wish to study this matter, which is of the utmost importance to landscape photographers. It may be asked, Why take negatives? the effect can be seen on the ground glass. There may be some gifted enough to tell exactly what the print from a negative will look like by examining the image on the ground glass, but I think they are very few. The difficulty arises from the want of light, except when a very large stop is used, and from the fact that it is all but impossible, as a rule, to see the image on the ground glass as a whole.

There is one thing I incline to state, although with some diffidence. It is that, when the impression of distance is really rendered in any other way, as by the correct representation of atmospheric haze, there is no necessity to add an out-of-focus effect, and it is generally a mistake to do so.

Different Planes in Relation to Focus.

There is another difficulty about leaving the distance out of focus. We have not the power of controlling to what extent the different planes shall be out of focus. The relative want of sharpness is purely a function of the distance. Thus, suppose we have a well-marked foreground, an object at a considerably greater distance that is distinctly the "principal object," and a "distance." The foreground, as has been stated above, must be made at least as sharp as any other part of the picture. The principal object may, perhaps, be made a little less sharp, but that is all. It may be desirable in this case to leave the distance quite appreciably out of focus, but this is generally impossible. If the "principal object" be several times farther away than the foreground, and the latter be focussed for, there will be no appreciable difference in sharpness between the principal object and the distance. There are some cases where the difficulty may be got over by focussing for a plane between the foreground and the principal object, but they are exceptional.

The Foreground.

Talking of foreground induces me to express the opinion that very few photographers seem to appreciate the importance of foreground—or perhaps they are debarred from making the best use of foreground by the extreme difficulty of treating it. I mean here, foreground quite close to the camera. We have only to look at the work of any good landscape painter to see what a power there is in foreground at quite a short distance—what an amount of relief it is capable of giving to a picture. Such foreground does not need to consist of important objects. A stem or a branch of tree, a bit of a road, a few agricultural implements, or a little foliage will do.

There are several difficulties in the case of rendering such foregrounds by photography. One is that of focus. This is especially felt in the case of large work, and where long-focus lenses are used. There is a certain class of photographer that is continually laughing at the *f*-32 man. Of course, a man who makes a habit of using *f*-32, or any particular stop, in all cases, deserves to be laughed at; but, if due attention be paid to foreground, I have no hesitation in saying that it is often necessary to use a stop much less than *f*-32 to get the foreground and the rest of the picture even fairly into focus. This brings another difficulty, namely, prolonged exposure, and, as the most appropriate foregrounds for the work under discussion very often consist of foliage, which is very seldom still, the difficulty becomes serious. There is still one difficulty more, and that arises from the tendency that photography has to render such near foregrounds as I have been writing of too dark. This can often be got over by appropriate selection, in other cases by skilful manipulation of the lens cap. Only in some stereoscopic work, done at the time that the stereoscope was so much used that the masters of landscape photography produced pictures of it, have I seen foregrounds treated as I here describe.

Breadth of Effect and Suppression of Detail.

It seems to me that many of those who have no part of a photograph sharp fall into a certain error. They state that the defect of ordinary photographs is the want of "breadth." There is no doubt they are right here, but they seem to go farther. They appear to think that if definition be suppressed by having no part of a picture in sharp focus, breadth will result. But will it? In the first place, is "breadth of effect" obtained by artists by suppressing detail? To a certain extent it is, but I think it is effected more by emphasising salient points. But, even so far as the detail goes, I cannot see that leaving the picture out of focus suppresses this detail. It only confuses it, and, in some cases at least, makes it more conspicuous than it otherwise would be.

How to get "breadth of effect" is certainly the great problem for photographers. Beyond selection of subject and occasional manipulation of the exposure, so that one part of the subject gets more than another, I can see nothing to be done but to "dodge" the negative in printing, sometimes by shading one part of it for part of the exposure, sometimes by working with pencil and stump on tissue paper stretched on the back of it. And I believe the purists, who are just those who most recognise the lack of "breadth" in photographs, consider this practice illegitimate.

However this may be, I wish to impress on landscape photographers that the very highest judgment can be exercised in deciding (1) what plane of a subject shall be focussed for, (2) what stop shall be used. Indeed, the differences of effect that can be produced by varying these two factors alone are so great, that it ought, I think, to entitle photography to rank as a high art.

W. K. Burton.

ON THE METHOD OF EXAMINATION OF PHOTOGRAPHIC LENSES AT THE KEW OBSERVATORY.*

17. *Illumination of the Field. The figures indicate the relative intensity at different parts of the plate.*

With C.I. Stop No. .		With C.I. Stop No. .
At the centre 100	: Ditto	100
At inches from the centre	: Ditto	
At inches from the centre	: Ditto	

The intensity of illumination of the field is always greatest near the axis of the lens, and falls off more or less rapidly towards the edges of the plate. The lens should therefore be examined with the view of ascertaining if this inequality of illumination is greater than that which experience shows must be tolerated under given circumstances. The apparatus employed for conducting this test is shown in Fig. 23, the method being devised by Captain Abney. There is a fixed lamp, L, the

Fig. 23.

position of which is not changed during the observations; F represents a paper screen, placed in that position in order to give a practically uniform source of light: O is the lens, which is fixed in a frame, not shown in the sketch, revolving upon the pivot N; by means of a suitable adjustment this axis, N, is made to pass through the nodal point of emergence of the lens. At S there is a sheet of cardboard with a small hole in the centre at H, and this screen, hole and all, is covered with thin white paper on the side away from the lens; the distance between H and N is always made equal to the principal focal length of the lens; the bar D is made to cast a shadow from the movable lamp M on the paper just over the hole in the cardboard; thus, in this shadow, the paper is illuminated entirely by transmitted light from the lens, whilst the paper round it is illuminated entirely by the light of the movable lamp.

An observation is made in the following manner:—The lens is first placed in such a position that its axis passes through the hole H; the lamp M is then moved backwards or forwards until the transmitted illumination of the paper at H is made to match as nearly as possible the reflected illumination of the paper round it; the distance between S and M is then noted. The lens is now placed in the position shown in fig. 23, where AB represents the length of the diagonal of the plate for which the lens is being examined, and where the angle ϕ is half the angle of the field under examination. The balance of light is readjusted by a movement of the lamp, and the distance MS is read off a second time. By finding the inverse ratio of the square of these two readings, we thus obtain the ratio between the illuminations at P and H, the lens being in the position shown in the sketch, and the object being supposed to be equally illuminated in both cases. But what is wanted is the ratio between the illumination on the plate at P and A; this is found with perfect accuracy by multiplying the ratio of the illumination at P and H, as above obtained from the observations, by $\cos^3 \phi$, and this result is that which is entered in the Certificate of Examination. The relative illumination of the centre and of any part of the field can, of course, be obtained in this manner, in the above instance the corner of the plate being the point chosen.

This test may with advantage be made with the largest stop supplied, and also with the stop which has been shown, under test No. 13, to give good definition over the whole plate.

It cannot, however, be denied that there are objections to this method of examination. The fact that the illumination of the plate is not uniform is due to several causes:—(1) The amount of light which passes through any aperture evidently diminishes with the obliquity. (2) With lenses not free from distortion, the effective aperture itself varies with the angle of incidence. (3) The amount of reflection from the surfaces of the lenses, and consequently the amount of transmitted light, varies with the angle of incidence. The method of observation above described may be said to fully take into account these three causes of variability in intensity. Then again (4) the light falling on the plate varies inversely as the square of its distance from the nodal point, and also (5) with the obliquity with which the rays strike the plate. As far as these two latter considerations alone are concerned, it is evident, therefore, that the illumination on the plate varies as the third power of the angle incidence, and also that by multiplying the result obtained on the screen at H by $\cos^3 \phi$ we obtain the required result on the plate at A. Thus the record in the certificate includes all these first five causes of irregularity of illumination. But there are other causes which are not correctly represented in this method of examination. In lenses not free from distortion the nodal point of emergence varies in position with the angle of incidence, and, as the pivot N does not shift its position with reference to the objective during the observation, the condition of illumination of the photographic plate cannot be accurately represented. This is probably a trifling cause of inaccuracy, but one somewhat serious source of error remains to be mentioned. The method of examination does allow for (6) the variation of illumination due to the different amount of glass through which the oblique pencils have to travel; but, as the observation is made by eye, no allowance can be made for the fact (7) that the actinic rays may be affected in this manner out of all proportion to the apparent variations produced in the visible rays.

The method of examination adopted at Kew assumes that the light transmitted through the paper, as well as that reflected from the paper, varies in amount with the intensity of the incident light Captain Abney informs me that his experiments prove this to be the case. But in making the observation the eye should be placed in the same position during both readings; for we have no reason to suppose the transmitted and reflected lights vary in the same way with the angle of vision.

It is impossible to suppose that the screen F will be illuminated with perfect regularity, even near its centre, and this must be a source of error, though probably a negligible one. When the axis of the lens passes through H the rays which are brought to a focus at that point will be parallel to each other as they enter the lens; but when the axis of the lens is inclined this cannot be the case, for H will no longer be on the principal focal surface; the screen F should therefore be brought as near the lens as possible, as by that means the part of the screen from which the light comes will be more nearly identical in the two cases. The lamp L should, moreover, be placed as far from the screen as practicable, so as to make the illumination as uniform as possible. With lenses in which the nodal points are some distance apart, the part of the screen from

concluded from page 795.

which the light comes will vary considerably with the inclination of the axis, and considerable errors might be introduced by uneven illumination of the screen.

In deciding on the quality of a lens as regards the illumination of the field, this test should be considered in connexion with test No. 10, under which heading are given the angles of the cones of illumination. With regard to the normal use of any lens, except perhaps such as are specially designed for portraiture, certainly the whole of the smallest stop, and, as a rule, the whole of the largest normal stop, should be visible from the whole of the plate; for if the plate extends much beyond the limits of the inner cone (outside which the aperture begins to be eclipsed), the falling off of density near the edges of the plate will be a serious defect in the photograph. When considering the part of the field lying within this inner cone, it is to be noted that, the wider the angle which the lens covers, the greater is the inconvenience caused by the diminished density near the margin; if the stop is in front of or behind all the lenses, the intensity of illumination of different parts of the plate can be shown in this case to vary approximately as the fourth power of the cosine of the angular distance from the axis of the lens, and in cases where the stop is between two lenses, the limits of variation will be the third and fourth powers of the cosine of the angle. The following table is therefore inserted to give an approximate idea of the decrease of illumination as we recede from the axis of the objective, the truth lying *theoretically* somewhere between the two limits here given:—

ϕ.	$\cos^3\phi$.	$\cos^4\phi$.
0°	1·00	1·00
5	0·99	0·98
10	0·96	0·94
15	0·90	0·87
20	0·83	0·78
25	0·74	0·67
30	0·65	0·56
35	0·55	0·45
40	0·45	0·35
45	0·35	0·25

Eminent lens-makers have spoken of the illumination produced by their lenses as being uniform from the centre to the margin, but our experience is that the decrease is even more rapid than here indicated. The above table shows how very objectionable is the use of wide-angle lenses, whenever they can possibly be avoided. It shows, moreover, that the theoretical exposure for different stops should be materially modified according to the angle which the lens covers; for intance, taking the last column to represent the truth, it would be right, even though the stops in the two cases had the same C.I. number, to give half as much exposure again with a 90° objective as with one only covering 40°, in order to get the same mean exposure over the whole plate.

In connexion with this test, it may be mentioned that the most serious omission in the Kew examination is, that there is nothing to show the actinic transparency of the glass. A slight yellow tinge in the lenses, which would not be noticed by the eye, might yet be sufficient to seriously affect the rapidity of the objective. But no test could be devised to investigate this point which did not introduce photographic methods, and, as already stated, the consideration of expense put such operations out of consideration for the present. I should like, if possible, to have introduced some test which would have at the same time indicated the actual rapidity of the lens, and also the actual falling off of density towards the margin of the photograph; with the aid of photography this would not have been difficult, and a plan of this kind would have been adopted, but for the cost. This subject is, however, still under consideration by Captain Abney.

LEONARD DARWIN, Major R.E.

MR. A. R. DRESSER ON "ENLARGING."

BEFORE the Blackheath Camera Club, on November 29, Mr. A. R. Dresser gave a lecture on *Enlarging*, in the course of which he said that enlarged prints might be obtained from small negatives either by putting the negative in the camera and projecting the image through the camera and lens on to a sheet of bromide paper, or by fixing the negative in the window and taking a positive from it on paper in a large camera, this being the method he used himself and recommended as being productive of the best results. All his own enlargements were made by daylight, as he considered this more satisfactory than any artificial illuminant, the success of an enlargement depending greatly upon the brilliancy of the light. He explained that stopping down the lens does not increase the definition for enlarging purposes, though it may sometimes appear to do so. When a stop is used, the exposure is diminished, and, therefore, the print, when developed, may have greater contrasts than one given the same exposure with full aperture, thus giving an effect which sometimes is mistaken for sharper definition.

With regard to exposure, to enlarge from a quarter-plate negative of fair density up to 12 × 10 on an ordinary fine day, with stop *f*-16, he would give from three to four minutes' exposure, or with a thin negative, about two minutes. He considered iron to be the best developer for bromide paper, although, as he generally toned his prints with uranium, he had given up using it, on account of the difficulty of completely eliminating the iron from the print. The slightest trace of iron will cause blue stains in the toning.

The developers he recommended were eikonogen and amidol, and he gave the following formulæ:—

Eikonogen Developer.

Eikonogen	1 ounce.
Soda sulphite	4 ounces.
Potass. carb.	1 ounce.
Soda carb.	1½ ounces.
Water	30 ,,

No bromide being necessary. It is advisable to dilute this developer with half water until you become accustomed to its action.

Amidol Developer.

A.

Amidol	1 ounce.
Potassium metabisulphite	1 ,,
Water	10 ounces.

B, a saturated solution of either washing soda or potassium carbonate; C, a ten per cent. solution of potassium bromide.

For use take A, 1 drachm; B, 1 drachm; C, 5 drops; and water, 1 ounce.

Prints should not be cleared until after fixing, to avoid carrying any acid into the hypo bath.

When very rough paper is used it should be well soaked in water before developing, but this paper should only be used for suitable subjects.

If the print appears to come up too rapidly, from over-exposure, pour off the developer, and turn print upside down in a dish of water and leave it to develop by itself; it will rapidly gain density without fogging.

In the case of a negative in which any portions are either weak or over dense, it is better to try to counteract these deficiencies by dodging during the exposure than by trusting to local development or reduction.

THE OPTICAL LANTERN AND HOW TO USE IT.

THE Rev. W. H. K. Soames gave a discourse on this subject on December 8 before the Blackheath Camera Club.

In speaking of the source of light, the lecturer explained the advantages of the mixed jet over the blow-through jet. The jet being nearer the lime, and giving a smaller point of light, better definition is obtained. There is no flame, and very little heat from it, and it uses considerably less hydrogen. With the blow-through jet coal gas can be used, but hydrogen gives a better light when it can be obtained.

When using these gases, the bottle valves must be turned on full, and the governors allowed to take the pressure. The supply being regulated by the valves to the jets, care must be taken to see that these valves are closed before turning on the gas at the bottles.

He pointed out that when a short-focus objective is changed for one of long focus, the condenser must also be changed to get a good result. To explain this, he showed the different effects and sizes of discs produced with different lenses.

In lighting the lantern the hydrogen must be turned on and lighted first, and then the oxygen turned on slowly, and both gases regulated until a perfect light is obtained. The lime should be turned every two or three minutes, or else with the mixed jet the flame will double back from the small pit formed in the lime and crack the condenser; it will not do this with the blow-through jet, but the flame from the hydrogen may fork out and set fire to the lantern. With short-focus lenses the light must be nearer the condenser than for long-focus lenses; but with either lens, if it is too near, a dark mark will appear on the disc; the light should be moved laterally or vertically until this mark is exactly central, and then drawn back from the condenser until the mark entirely disappears.

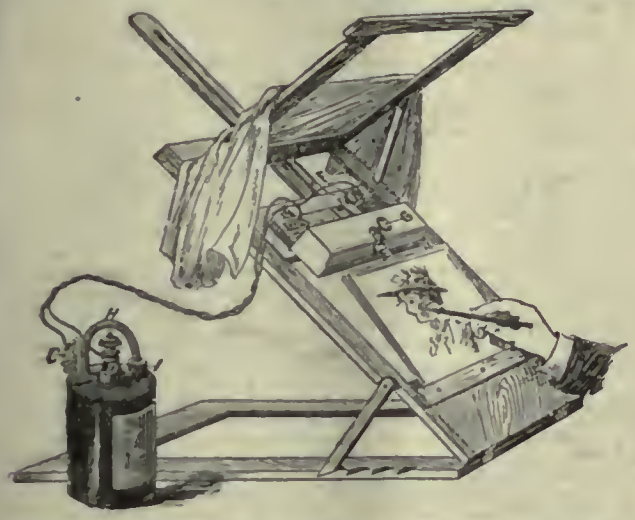
After the lecture a number of slides were shown, the disc being thrown upon a blue distempered wall with excellent effect.

RETOUCHING BY ELECTRICITY.

WE have already alluded to an electric retouching apparatus of German inception and manufacture, which is now being employed in America and on the Continent, and a considerable degree of interest has been manifested in this country as to its nature and probable value in retouching.

By the kindness of Mr. C. A. Rudowsky, 3 Guildhall-chambers, E.C., we have been permitted to examine one which he has just imported in

order to have its value tested by expert retouchers in this country. The pencil is held in the hand, and is manipulated in the usual way; but the negative, when placed on the easel with the upper end resting upon a

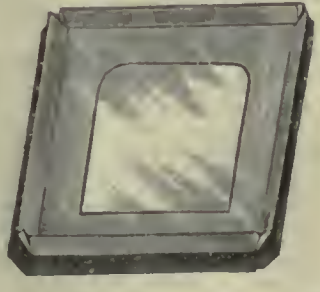


padded ledge of the apparatus, is subjected to a series of rapid vibrations by which what would otherwise be an unbroken pencil line is now interpreted by a stipple of greater or less granularity, the coarseness of the stipple being determined by the adjustment of a screw. The cut shows the apparatus adapted to an ordinary retouching desk.

It is claimed that the smoothing of the skin is most easily accomplished, and even larger spaces, which in ordinary circumstances have to be covered from the back, are easily and quickly retouched with this apparatus; and that it is a great improvement upon any electric retouching apparatus that has been introduced before, as the retoucher here is not influenced by the current, and only the negative vibrates. Using an apparatus three or four hours a day, one current is sufficient for more than a year; while two currents, which are used alternately, will last years. With large plates two currents combined are used. The price is certainly reasonable enough, being only 36s.

A COMBINED LANTERN MASK AND BINDER.

The Blackfriars Photographic Company, of Surrey-row, are introducing a combined lantern mask and binder, which should greatly facilitate the mounting of lantern slides, and be convenient in other respects.



In effect, it consists of a couple of masks joined together, the edges being left free and coated with mucilage. All then that remains to do is to place the slide and cover glass in position as usual, and secure them by moistening and pasting down the gummed edges. The idea is a happy one, and reduces the trouble of mounting slides to the minimum. The usual variety in the shapes of the mask openings are available.

FERROTYPE PORTRAITURE BY FLASHLIGHT.

Mr. L. Nievsky has recently been demonstrating, with great success, a simple method of taking portraits at night on ferrotype gelatine plates. The system is semi-automatic, being, we believe, analogous to, if not identical with, that laid under contribution during the last summer for daylight portraiture. Briefly described, the apparatus is as follows:—Forty ferrotypes, in sheaths, are held in a receptacle placed on top of the camera, and when the sitter is focussed a lever adjustment places one plate in position, the exposure is made by means of a flashlight, and by two simple movements the plate is conveyed to the developing tank, where it is subjected to the action of the developer, fixer, and wash water actuated by three separate pneumatic balls.

The exposure required at night is about two seconds with six to eight grains of magnesium blown through a spirit flame. A strong hydroquinone developer is used, the rapidity of its action depending on the temperature. At this time of the year, in an ordinary room, less than a minute suffices to develop a picture. The presence of a small quantity of hypo in the developer acts, according to Mr. Nievsky, as a restrainer, the developer required being a very powerful one for such quick work, and a much brighter image being obtained by the mixture. Some sixty or seventy plates (size about $1\frac{1}{2} \times 1\frac{1}{2}$) are developed in one solution.

We have been present on two occasions when Mr. Nievsky has taken the portraits of members of societies with the Simplex (as it is called), and can speak as to the nature of the results, which, of the kind, are excellent. The portraits are delivered washed, dried, and mounted in two or three minutes.

THE "HOLBORN" HINGED-SPRING PRINTING FRAME.

Messrs. Geo. Houghton & Son (89, High Holborn, W.C.) have sent us a sample of a printing frame they are making, the peculiarity of which

lies in the springs by which pressure is produced. These are so bent that each one bears in two places on the pressure board, and is hinged at one end so as to fold over directly upon the pressure board, the loose end then being fastened in a simple manner, as shown in the cut.

A THOUSAND CANDLE-POWER ILLUMINATOR.

As an aid to the feeble daylight prevailing in winter, magnesium may be employed with excellent effect in obtaining portraits. But flash-lamps, although exceedingly useful in numerous cases, are not well adapted for an exposure of several seconds during a dull day. We have seen good

effects in lighting obtained by reversing, in a sense, the usual conditions under which the sitter is illuminated, employing the daylight to lighten the shadow side, the predominating light being obtained by magnesium; and while there is any daylight at all worthy of the name, the sitter will not be disturbed by the artificial light.

To aid in this *desideratum*, Messrs. Perken, Son, & Rayment have introduced a continuous photo-exposure illuminator, shown in the cut, in which magnesium powder, blown through a spirit flame, causes a continuity of light that is highly actinic. The large rubber reservoir by which the pressure is maintained is kept inflated by the smaller one. The reservoir is of such dimensions as to contain a considerable quantity of magnesium. It is claimed that this illuminator possesses features of difference from other magnesium lamps of the continuous order.

Our Editorial Table.

The American Annual of Photography.

We are favoured by Mr. Jonathan Fallowfield with a copy of this well-known annual issued by the Scovill & Adams Company, New York. Got up in the style for which this annual has acquired a high reputation, with its good paper and bold typography, it is further enriched by several nicely executed process-block illustrations. The contributed articles are of the usual variegated character, and embrace the topics of current interest. Mr. C. W. Canfield continues from a former issue his interesting notes on the portraits of Daguerre. Mr. Jerome Harrison describes a camera called the "Henry Clay," made by the Scovill & Adams Company. M. Duchochois condemns simultaneous toning and fixing; the Rev. G. M. Searle contributes a suggestive article on taking stereoscopic negatives with the aid of a prism; Dr. Clarence C. Woodman an equally excellent one on "Detective Camera Focussing." These together with many others make an excellent book of photographic reading matter. We may, perhaps, be permitted to take exception to an article by G. C. Rhoderick, jun., in which he recommends the making of "stereoscopic" views by mounting side by side two identically similar prints obtained from the same negative. This writer seems to forget that to produce a stereoscopic picture two *dissimilar* views of the subject must be employed. Despite this there is so much that is sound and good in the *Annual* that it may be well passed over. The work sells at 2*s*. in paper covers, and 4*s*. bound.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 21,886.—"Improvements in Photographic Cameras." E. H. P. Humphreys.—*Dated November* 30, 1892.

No. 21,896.—"Improvements in Photographic Lens Mounts." T. Crawford.—*Dated November* 30, 1892.

No. 21,946.—"An Improvement in Photographic Cameras and Dark Slides for Same." L. S. Zachariasen.—*Dated December* 1, 1892.

No. 21,947.—"Improvements in Photographic Cameras." F. Beauchamp.—*Dated December* 1, 1892.

No. 21,975.—"Improvements in connexion with Photographic Cameras.' C. Shaw and J. Burn.—*Dated December* 1, 1892.

No. 22,018.—"Improved Means of Focussing in Photographic Cameras, such as 'Detective' Cameras." A. L. Adams and B. Foulkes-Winks.—*Dated December* 1, 1892.

No. 22,158.—"Improvements in or Connected with Photographic Apparatus." Communicated by S. Hirschfelder and L. Dannhauser. W. P. Thompson.—*Dated December* 3, 1892.

No. 22,171.—"Improvements in Stands or Supports for Photographic Cameras or other Objects." J. E. Thoanton and E. Pickard.—*Dated December* 3, 1892.

No. 22,198.—"Improved Means of Securing the Entire Coloured Surface of Hand-coloured Photographs to Glass." G. Watson.—*Dated December* 3, 1892.

No. 22,525.—"An Improvement in Photographic Printing Frames." A. T. Newington.—*Dated December* 8, 1892.

No. 22,532.—"Improvements in Shutters for Photographic Cameras." G. D. Hughes.—*Dated December* 8, 1892.

No. 22,576.—"The Employment of Diamido-dioxybenzol in combination with Sulphides of the Alkalies for Developing the Latent Image in Layers containing Halogen Silver for Photographic Purposes." J. Hauff.—*Dated December* 8, 1892.

No. 22,633.—"An Improved Dish or Case for use in Photographic Development or other Process." Complete specification. H. Rayner.—*Dated December* 9, 1892.

No. 22,671.—"Improvements in Coin-freed or Coin-operating Photographic Apparatus." B. J. Edwards.—*Dated December* 9, 1892.

SPECIFICATIONS PUBLISHED.

1891.

No. 21,381.—"Photographic Sensitive Plates." Sandell.

No. 21,716.—"Photographic Apparatus." E. & P. Franck-Valery.

1892.

No. 625.—"Roll-holders for Photographic Films." Communicated by Brownell. Boult.

No. 3486.—"Magic Lantern, Slides," &c. Erskine & Taylor.

No. 941.—"Photographic Cameras." Jeffrey & Wishart.

No. 15,985.—"Teaching Ocular Dioptrics." Communicated by Vitali. Lake.

An Improvement in the Manufacture of Sensitive Plates for Photographic Purposes.

No. 21,381. John Tyack Sandell, 10, Pall Mall, London, S.W.—*November* 19, 1892.

My invention relates to an improvement in the manufacture of sensitive gelatine plates for photographic negatives, and it has for its object to diminish the liability to halation and solarisation (or reversal of the image) which are incidental to photographic plates as now made when subjected to a comparatively slight excess of exposure.

By employing plates made according to my invention, it is possible to produce photographs in which all the details of subjects presenting strong contrasts of light and shade are perfectly brought out. For example, the interiors of churches and the like, where the windows and other apertures are illuminated by a strong external light, are exceedingly prone to halation and solarisation of those brilliantly illuminated portions, coupled with insufficient exposure of the less strongly illuminated parts of the subject; but by my invention these defects are avoided, as a much greater latitude in the duration of exposure is admissible without injury to the resulting negative, by reason of the fact that, owing to the compound structure and differential sensibility of the improved plate, what would be over-exposure in the case of an ordinary plate of similar rapidity is compensated, as hereafter described.

My invention consists in coating the plate, substantially as hereinafter set forth, with two or more superposed coatings or layers of gelatine emulsion, having different degrees of sensibility to actinic light, so that different portions of the picture which are in strong contrast as regards strength of illumination will be photographed virtually upon layers or strata of different degrees of sensitiveness, the effect produced upon the haloid silver salt or salts of the less sensitive stratum thus compensating for the deficiency of intensity due to over-exposure of the corresponding portion of the more sensitive stratum. The coating which is first applied to the plate, and which constitutes the underneath or rearmost stratum, should possess the least degree of sensitiveness, and the front or uppermost one should possess this quality in the highest degree, the intermediate layer or layers (in the case of more than two) progressing in regular gradation between the two extreme degrees of sensitiveness. The prevention of halation is due to the greater opacity and lesser sensibility of the lowermost stratum, which has the effect of absorbing, and so obstructing the transmission of the most powerful rays of light to, and their reflection from, the surface of the support upon which the layer is applied.

The gelatine emulsions composing the different layers or strata would contain any of the usual haloid salts of silver commonly employed. For instance, the first or underneath coating or stratum may be composed of an ordinary bromide of silver emulsion, the next may also be of bromide, or it may be of bromo-iodide, or chloro-bromo-iodide of silver emulsion, or all the coatings may be composed of an emulsion of the same haloid salt, but in any case the second and subsequent coatings will be of progressively increasing degrees of sensitiveness, such difference of sensitiveness being obtained in the preliminary preparation of the emulsion by subjecting it to heat, or treating it with alkali in the ordinary way of treating emulsions for the purpose of increasing their sensitiveness to light. Similarly, as regards the third and subsequent coatings (that is to say, if more than two are used), they would be of successively greater degrees of sensitiveness produced in the same manner by heating or treating with alkali. Generally, two coatings would afford strata of sufficiently different degrees of sensitiveness to meet the ordinary requirements of any kind of landscape work, whilst three coatings are preferable for the majority of interiors.

It is, of course, to be understood that each coating is to be allowed to thoroughly set and dry before another is applied.

In order to ensure the most satisfactory results in working this process, it is essential that the different strata, although varying in sensitiveness to light, should be perfectly uniform in respect to the quality of hardness, and the consequent liability to shrinkage in drying. To attain this essential uniformity, it is important to observe that the gelatine from which the different emulsions are prepared should be of the same make and quality; the different emulsions should be prepared as nearly as possible at the same time; should be subjected to similar and contemporaneous treatment during "ripening," and should be hardened to equal extents by the addition of alum or chrome alum in the usual way, so that (save in respect of the differences in preliminary treatment by cooking, or with alkali, upon which their respective sensitiveness to light depends), the different emulsions to be superposed will be as nearly as possible alike in their purely physical qualities.

In the manufacture of a doubly coated plate for general purposes, I prefer for the undermost layer, or that next the glass, an emulsion prepared by the boiling method, of great fineness of grain, which is more amenable to development than the more sensitive upper coating. The sensitiveness of this undermost film should be about from fifteen to eighteen on what is known as Warnerke's sensitometer, and the percentage composition of the dried film, as calculated from the formula adopted, is—

Gelatine	68·3 parts.
Bromide of silver	29·33 ,,
Iodide of silver	1·1 ,,
Bromide of potassium	·27 part.
Chrome alum	1 ,,

and these quantities in ounces would represent the solid matter contained in 770 ounces of fluid emulsion made up to that quantity with alcohol, thirty fluid ounces, and water.

The emulsion for the upper layer consists, preferably, of a mixture of one

part of a boiled emulsion made by means of the centrifugal separator which is found to have greater opacity, and is consequently less prone to halation, and two parts of emulsion made by what is known as the ammonia method. These emulsions have the same composition as that of the undermost layer except that they contain only ·33 part iodide of silver, and have the greatet degree of sensitiveness which it is possible to obtain at the present time and by the present methods.

The undermost film or layer of a trebly-coated plate is composed preferably of an emulsion prepared by heat alone and brought to a sensitiveness represented by five on the Warnerke sensitometer. In composition it resembles the previously-described emulsions, except that iodide of silver is omitted from, and citric acid one part added to, the formula already given. The upper layer of a trebly-coated plate would be the same as described for the upper layer of a doubly-coated plate, and the intermediate layer of the trebly-coated plate would be the same as the undermost layer of the doubly-coated plate.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is—1. The preparation of sensitive photographic plates having two or more superposed coatings or layers of gelatine emulsion which possess in regular gradation from the undermost to the uppermost coating or layer, progressively increased degrees of sensitiveness to light, substantially as and for the purposes described. 2. In the manufacture of sensitive photographic plates, the combination of two or more superposed coatings or layers of gelatine emulsion possessing in regular gradation from the undermost to the uppermost coating or layer progressively increased degrees of sensitiveness to light, so as thereby to lessen the liability to solarisation and halation, as specified.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
December 19 ...	Camera Club	Charing-cross-road, W.C.
,, 19 ...	Dundee Amateur	Asso. Studio, Nethergate, Dundee.
,, 19 ...	Glasgow & West of Scotland Am.	190, West Regent-street, Glasgow.
,, 19 ...	Hastings and St. Leonards	
,, 19 .	Leeds Photo. Society	Mechanics' Institute, Leeds.
,, 19 ...	Richmond	Greyhound Hotel, Richmond.
,, 19 ...	South London	Hanover Hall, Hanover-park, S.E.
,, 20 ...	Birmingham Photo. Society	Club Room, Colonnade Hotel.
,, 20 ...	Brixton and Clapham	376, Coldharbour-lane, Brixton.
,, 20 ...	Exeter	City Chambers, Gandy-st., Exeter.
,, 20 ...	Hackney	206, Mare-street, Hackney.
,, 20 ...	Keighley and District	Mechanics' Institute, North-street.
,, 20 ...	North London	Wallington Hall, Islington, N.
,, 20 ...	Paisley	9, Gauze-street, Paisley.
,, 20 ...	Rochester	Mathematical School, Rochester.
,, 21 ...	Brechin	14, St Mary-street, Brechin.
,, 21	Bury	Club Rooms, 13, Agar-street, Bury.
,, 21 ...	Manchester Camera Club	Victoria Hotel, Manchester.
,, 21 ...	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 21 ...	Southport	The Studio, 15, Cambridge-arcade.
,, 21 ...	Southsea	3, King's-road, Southsea.
,, 22 ...	Camera Club	Charing-cross-road, W.C.
,, 22 ...	Glossop Dale	
,, 22 ..	Hull	71, Prospect-street, Hull.
,, 22 ...	Ireland	Rooms, 15, Dawson-street, Dublin.
,, 22 ...	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 22 ..	Oldham	The Lyceum, Union-st., Oldham.
,, 23 ...	Cardiff	
,, 23 ...	Croydon Microscopical	Public Hall, George-street, Croydon
,, 23 ..	Holborn	
,, 23 ...	Maidstone	"The Palace," Maidstone.
,, 23 ..	West London	Chiswick School of Art, Chiswick.
,, 24 ...	Hull	71, Prospect-street, Hull.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

DECEMBER 13, the President (Captain W. de W. Abney) in the chair.

It was announced that the Hackney and Cheltenham Photographic Societies had been admitted to affiliation of the Society.

The following seventeen gentlemen were elected members of the Society:—Messrs. Wilson, C. P. Canstine, J. A. Sinclair, Wm. Taylor (Leicester), G. E. Franklin, W. Kerman, Lieutenant G. A. Beasley, Charles F. Treble, A. Pumphrey, Captain W. A. Gale, B. H. Thwaite, Birt Acres, E. C. Hertslet, H. A. Chapman, George Mason (Glasgow), A. F. Mowll, and H. A. Morrison.

PHOTOGRAPHIC LENS TESTING AT KEW.

MAJOR LEONARD DARWIN, R.E., M.P., read a paper on this subject. [This will appear in a future number.] He observed that he had already written one exhaustive paper for the Royal Society [see THE BRITISH JOURNAL OF PHOTOGRAPHY, *ante*], which left him little new to say, so that he was obliged to repeat in substance much that he had said before, dwelling, however, with more force on the practical side of the question. At the conclusion of the paper,

Mr. W. E. DEBENHAM said it was very desirable to have such an institution as that at Kew, and he hoped it would put an end to some wrong notions which photographers had cherished so long, particularly one as to certain lenses and their "depth of focus." He hoped that in future they would not see advertisements of lenses having greater depth of focus than others. As to the term "covering effectively employed" to distinguish narrow, medium, and wide-angle lenses, he thought, as "effectively" meant a certain amount of definition, the term should more properly be "defining effectively" with regard to a certain standard. Definition that was satisfactory for one subject was not so for another; it was considered prejudicial by some photographers. As to photographers not using a larger stop than that for which the lens was tested, many people preferred a picture which was darker towards the margin than at the centre; and he did not think that it was desirable to define any point beyond which a negative should be considered inferior as regards equality of illumination. For the sake of enlargements, it was desirable to ascertain the focal length accurately. Adverting to the battle of the standards, he said that lest it should be supposed that the Congress International standards had been universally accepted, he would point out that he considered the decision of the Photographic Convention as valuable as that of the Paris Congress on the subject.

Mr. T. R. DALLMEYER gathered that the Kew authorities had some little trouble about having lenses sent to them with a "supposed" covering power; but he thought that if they at Kew would simply take the lens sent as though they knew nothing about it, say what it would cover with various stops down to a low intensity and mention the circles of illuminations at those apertures, an ordinary photographer would be able to judge of the capabilities of the lens, and whether it would fulfil its purpose. With regard to the C.I. system, he was much in favour of it. Major Darwin would, no doubt, agree that it would be an advantage to have the circles of illumination with the full stop and a small stop, and if both were mentioned it might be useful. Flare spot was a point of great importance. With a large number of concave surfaces towards the plate, reflections were re-reflected. "Definition" might be settled in a more definite manner by referring to the question of separating power. Actinism might be put to a practical test with the focimeter. The practical test as to how a lens performs at the margins of the field was one that fell to opticians themselves, and he should like to see it acknowledged by the Kew authorities by a method of testing. It was not wanted with absolutely symmetrical lenses, but great skill was required with unsymmetrical lenses.

Mr. J. R. GOTZ suggested that tests should be applied to fixed diaphragms between lenses in order to ascertain whether the apertures they represented were correct.

Mr. HUGO (of Kew), who has the practical work of lens-testing in hand, found that in testing lenses two or three times the results were very accurate.

Mr. H. CHAPMAN JONES asked whether simple inspection was considered sufficient test for flare spot? He found that it showed more clearly with small apertures than with large ones. He had recently been using two lenses with smaller stops than hitherto, and they both gave flare spot. The stops were so small that he could hardly see the image.

In replying on the discussion, Major DARWIN said the Kew Committee would consider the suggestions made. With regard to Mr. Debenham's criticism on the term, "effectively defining," the case might be met by the omission of the word effectively. Respecting the same gentleman's remarks as to people who might prefer a picture which fell off in density at the edges, he (Major Darwin) thought most people would prefer an evenly-illuminated field. The test for flare spot ought to be done by means of photography, but it was impossible to introduce photographic tests at Kew. They did it as well as they could, and kept a sharp look out for flare spot with small stops. As to Mr. Dallmeyer's remarks with regard to the different sizes of plates a lens would cover, they would receive attention. They, however, could not get a good test object for a separating system. They must at Kew test on near and small objects on account of the atmosphere. In conclusion he said it would have been difficult to get the testing system to perfection without the assistance of Mr. Hugo.

Mr. FRANCIS GALTON, F.R.S., the Chairman of the Kew Committee, said that the instrument worked charmingly. They had enlisted the services of competent people.

The PRESIDENT, in moving a vote of thanks to Major Darwin, suggested that the Kew Committee should do what the Science and Art Department did with papers that did not obtain a certain percentage of marks. Bad lenses should be charged a double fee, and that might prevent a great deal of useless work. It was often not worth while to go into all the descriptions, for there were certain lenses on the market actually not worth the testing fee. As to the C. I. system, as a delegate of the Society, he was instructed to opposed it, and he did; but he hated the metrical system, and would not even think in it. He always spoke in feet, inches, and grains, and he hoped it would give people a great deal of trouble in reading his papers; so that he agreed with both Major Darwin and Mr. Debenham. He thought the Kew method of testing satisfactory for oblique pencils.

The meeting then terminated.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 8,—Mr. R. Beckett in the chair.

Messrs. H. E. Farmer, W. F. Slater, and C. H. Oakden were unanimously elected members.

FERROTYPE PHOTOGRAPHY BY FLASHLIGHT.

Mr. L. Nievsky gave a demonstration of ferrotype photography by flashlight, employing for the purpose plates and apparatus of his own preparation and invention. Forty ferrotype plates which are coated with a gelatine emulsion are contained in sheaths and held in a tin box, from which they are bodily transferred to a plate box placed on top of the camera proper. When the sitter has been focussed, by means of a lever movement a plate is placed in position, and the exposure given to a magnesium flashlight (the lamp being secured in juxtaposition to the camera). The exposed plate is then released and dropped into a small tank, and by the pressure of three rubber bulbs the developer, the fixing solution, and the wash water, are successively applied to it. The time of development is largely influenced by the temperature of the solution, thirty to forty seconds being sufficient in summer. Mr. Nievsky uses a hydroquinone developer which, on this occasion, contained a small proportion of hypo. Several successful pictures of members were taken.

ACTION OF SEA WATER ON PHOTOGRAPHIC APPARATUS.

Mr. P. Everitt showed a dark slide (of Messrs. Watson's manufacture) which, with a camera and other slides, had been several months under water. The particular slide shown seemed, on the whole, little the worse for the immersion. The shutters of the slide were considerably bulged with moisture

when Mr. Everitt obtained the apparatus, but they had since dried out quite flat.

Mr. A. Haddon would like to know the composition of the varnish with which the slide had been varnished. It had apparently resisted the action of sea water for several months, and might be useful to photographers.

QUESTIONS.

The following question from the box was read: "In what form is uranium deposited when used for toning bromide prints?" The answer given was, "Ferrocyanide of uranium."

Question No. 2: "In the preparation of stereograms for the stereoscope, should the distance of separation determined be the measure between two similar points in the foreground of the picture or between two similar points in the distance? In Chadwick's Manual it states that in all measurements it is the foreground only which must be taken into account, and the distance takes care of itself. The questioner finds it impossible to reconcile this with the theory set forth on p. 13 of the same work."

The member who had put the question said that it appeared to him that the separation of the distant points would have to be greater if two objects in the foreground were to be separated, say, two and a half inches. He had always found it more satisfactory to measure points in the distance.

Mr. W. E. DEBENHAM agreed, and also thought that stereoscopes should have a lateral movement of the lenses, so that slight differences in the mounting might be overcome.

Question No. 3: "Is a lantern slide a picture?"

Answer: "As much a picture as any other photograph."

North Middlesex Photographic Society.—December 2, the President (Mr. J. W. Marchant) in the chair.—The meeting was chiefly engaged in the nomination of officers for election at the annual general meeting, and other formal business. A discussion took place upon the Exhibition, and unanimous approval was expressed at the Judges' action in enhancing the value of the certificates by reducing the number of awards to five, as the exhibits to which they were awarded were remarkably in advance of the others. It was announced that the first of a series of class meetings for the instruction of beginners in technical matters would be held in the first week in the new year. The subject had been under consideration by the Council for some time, and it had been arranged that the lessons should be confined to simple technical matters, and that the work should be done by the pupils under the instruction of one of the other members. A limited number of non-members of the Society who are beginners in photography will be welcome at these classes. Application should be made to the Secretary.

Hackney Photographic Society.—December 5, Mr. R. Beckett in the chair.—The Hon. Sec. announced that the next meeting would be set apart for demonstration by Mr. Walter E. Woodbury, on lantern slides, &c., by printing out.

South London Photographic Society.—December 5, 1892, the President (Mr. F. W. Edwards) in the chair.—A demonstration of enlarging in creaco fylma was given by Messrs. Hill, the method of using which has already appeared in these columns. At the conclusion of the demonstration, in answer to questions, Messrs. Hill stated that the process could not be successfully worked with a negative which had been previously varnished. Pyro-developed negatives were not so suitable as those developed with hydroquinone, rodinal, or amidol, the clearing solutions containing alum, used with pyro, having a retarding action on their solution. They claimed that the process did not produce distortion, and in support of this contention an enlargement of the interior of a church was produced, in which the lines were absolutely straight. Enlargements revealed detail which was not visible in the original negative, and a suggestion was made that this property might be made use of in revealing the structure of objects photographed by the means of photo-micrography.

Bolton Photographic Society.—December 6.—Mr. C. K. Dalton (the Secretary) read the annual report of the Council. This set forth that the members numbered eighty-one, and they had had one of the most successful years in the history of the Society. The Council regretted that the proposed "survey" of the town had not been actively followed up, but the question would again be brought up in 1893. The report was unanimously adopted.

Liverpool Amateur Photographic Association.—December 8.—From the report of the retiring Hon. Secretary, Mr. F. B. Illingworth, it appeared that the Association had, during the past year, taken the handsome and commodious premises which were now occupied. The new rooms were opened in June last, and, although the subscription had been raised in order to provide improved accommodation, the membership had increased, and there were on the rolls at the end of the year 309 members. Mr. A. J. Cleaver was elected President in the room of Mr. Wm. Tomkinson. Mr. J. H. Welch was appointed Hon. Secretary, and Mr. P. H. Phillips re-elected Hon. Treasurer. The Council were also appointed. Subsequently the President announced the list of the Association awards in the Annual Competitive Exhibition of prints and Slides. They were as follows:—Prints (half-plate and under), silver medal, Mr. G. A. Carruthers; bronze medal, Mr. F. K. Glazebrook; commended, Mr. T. B. Sutton. Over half-plate, silver medal, Mr. T. F. Lloyd; bronze medal, Mr. C. A. Timmins; commended, Mr. H. Holt. Two enlargements, silver medal, Mr. T. B. Suttou; bronze medal, Mr. C. A. Timmins. Stereo slides, bronze medal, Mr. W. S. Ellsworth. Hand camera work, bronze medal, Mr. J. W. Swindon. Exhibits by those who had never won a Society's medal, bronze medal, Mr. G. A. Carruthers, commended, Mr. A. C. Batty. President's prize, lady members, three prints, Miss Rose Collier; commended, Mrs. Marriott. Lantern slides, silver medal, Mr. H. Holt; bronze medal, Mr. J. H. Welch.

Rochester Naturalists' Club (Photographic Section).—December 6, Annual General Meeting, Mr. C. Bird in the chair.—The following were elected officers for the season 1892-3:—*Chairman:* Mr. C. Bird, B.A., F.G.S.—*Vice Chairman:* Mr. J. Whitfield.—*Committee:* Messrs. J. C. Boon, J. Hepworth, J. S. Hewitt, P. J. Neate, T. F. Tannahill, M.B., C.M., D.P.H., and R. Watts.—*Hon. Secretary:* J. L. Allen, Clover House, Chatham. It was arranged to have the meetings during the winter fortnightly on Tuesday evenings at 8.15 p.m. The first meeting was fixed for December 20, when Mr. J. C. Boon promised to read a paper on *Wet-plate Process*, and to illustrate same.

Rotherham Photographic Society.—Dr. Baldwin (President) in the chair.—The results of the Society's annual (members') competition were announced as under:—Class A, six untouched negatives (President's prizes), 1; H. C. Hemmingway, 2; G. T. M. Rackstraw. Class B, three untouched negatives and three prints therefrom taken during the Society's excursion, 1, H. C. Hemmingway. Class C (for those who have not taken a Society's prize), four untouched negatives, 1, John Clarke. Four prints, 1, W. H. Shepherd. This class did not fill, but the Council decided that the awards should be given. Class D, six contact prints, 1, H. C. Hemmingway. Mr. W. Mason was not far behind. Class E, six lantern slides, 1, E. Isle Hubbard.—Mr. Richard Keene of Derby was the Judge, and he sent some useful and kindly words of criticism. A vote of thanks was passed to Mr. Keene for his services. The Annual Exhibition was fixed for February 7 and 8.

Edinburgh Photographic Society.—December 7. Mr. Alexander Ayton (V.P.) occupied the chair.—The first public business was the exposition by Dr. Drinkwater of samples of various methods of toning chloride and bromide of silver prints. The platino-toned prints showed full mastery of the system, and might compare favourably with platinum prints themselves. The bromides were toned to various tints more pleasing than the common blue, grey, cold colours or that style of printing. The Chairman, in summing up the remarks made on the Doctor's exposition, called upon the members to make and keep notes of their experimental work for the Society's use, and more especially so with the latest introduced gelatino-chloride papers, which he thought were rapidly taking the place of, if not superseding, albumenised papers for silver printing. Mr. Haddow then brought before the Society one of Dallmeyer's telephoto lenses, and in explaining its parts and uses said that the principle was applicable to any ordinary compound photo lens, the addition making it more nearly an example of the Galilean method of construction. He stated that for distant objects this form was decidedly preferable to the ordinary lens, as, although it reduced the angle of projected image, it at the same time enlarged it on the plate from five to ten times, roughly speaking; but the proportion being due to the added negative lens, which could be varied at will, keeping to the principle, the size of image for distant objects was, to a large extent, at the command of the operator, combined with his knowledge of the instrument and its powers of adaptability. Mr. Haddow handed round two views which he had taken about a week ago of a portion of the central tower of Fettes College, the distance as the crow flies being nearly a mile, the lines of the mason work and the divisions of the slating being quite distinct. Discussion on this paper was postponed till next monthly meeting.

Dundee and East of Scotland Photographic Association.—December 1, Lantern Evening.—Amongst the slides exhibited by members, one created a good deal of interest. The slide was from a landscape negative (a highland loch and fine clouds) by Mr. D. Ireland, and made on one of the new rapid lantern plates of the Paget Company developed with amidol. The slide had been under-exposed, and, coming up very slowly, was left for a long time in the developer. On the plate being fixed, it was found that the high lights—namely, the clouds—had developed a fine rosy-pink, and the water of the loch was slightly tinged, the whole giving a very fine sunset effect.

Correspondence.

THE SOUTH LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

To the EDITOR.

SIR,—I notice a letter in your issue of December 9 referring to the late Exhibition in South London, and signed by one covering his identity under the pseudonym of "Young Member." At least one statement is made in this letter contrary to fact. The jurors did *not* "have in their hands catalogues which give the number and name of exhibitor clearly set forth," nor did we ever see any catalogue until the awards were all made on the merits of the pictures. In fact, this very circumstance caused us considerable trouble, because we found that awards had gone where the conditions did not allow them to go in several cases, and we had to rearrange our list of winners in order to meet the conditions laid down in the prospectus, awards in several cases going to those who had already got others.

I do not think the system of hanging the frames was the best, as, among other things, it caused much extra trouble to the jurors; but this is merely matter of opinion, and the system adopted had certainly some good points; but I do protest against statements made without proper inquiry into their truth, especially when they are insinuations against the good faith of executive and jurors, and I do further protest against such ungentlemanly allusions as appear in this letter of "Young Member" to the "stature and physique" of Judges at an exhibition. I can tell you and your readers that Judges have a sufficiently rough time during and after some exhibitions (I allude to mental, not bodily, hardship), without offensive and inconsequent gibes about their physique. It is about time that all anonymous criticism of Judges' awards should be suppressed; such criticisms are seldom unbiassed, and are often made scaffolds for purely personal abuse.—I am, yours, &c.,

ANDREW PRINGLE.

Cromwell House, Bexley Heath, S.E., December 10, 1892.

To the EDITOR.

SIR,—In your current issue you published a letter signed "Young Member," which contains an insinuation which I cannot let pass without a protest. The Judges never had the catalogue in their hands while judging, and, furthermore, the names of the successful exhibitors became known to them only after their awards had been communicated to the Hon. Secretary.

Although I never have felt anything but scorn for persons who, as in this case, make such insinuations under an anonymous signature, I must, nevertheless, express my gratification at "Young Member's" remarks concerning the Judges' "good stature and fine physique."

Our good stature and fine physique, however, did not prevent us from groping about on the floor and examining the exhibits he alludes to.—I am, yours, &c., F. P. CEMBRANO, JUN.

10, *Cambridge-gardens, Richmond Hill, Surrey, December* 9, 1892.

To the EDITOR.

SIR,—I only propose to refer to two points in the letter signed "Young Member" in your last issue, as it deals mainly with matters which are not of general public interest, but such as should be dealt with by the Committee of the Society.

When the Judges came to the Exhibition, I furnished them only with particulars of the various classes and the numbers of the pictures entered for competition in each of them, and with this information they proceeded with their work. It was not until after the judging had been completed and the awards signed that copies of the catalogue were handed to the Judges.

With reference to the showing of lantern slides, no distinction was made between any of the competitors, and if any of the pictures remained on the screen longer than others, the delay arose simply from the time occupied in finding and handing up to the operator the next reis, the adjustment of the lime, and matters of that kind.—I am, yours, &c.,

December 12, 1892. CHAS. H. OAKDEN, *Hon Secretary.*

[The writer of the letter signed "A Young Member" assured us that by publishing it a favour would be conferred upon a large number of members of the Society, and that the Society in general would benefit thereby. He also stated that he would be willing to give his name and address later if found advisable. Possibly, in view of the fact that two of the judges state clearly that his insinuation as to their having judged with the assistance of the catalogue is unfounded, he will, when acknowledging the correction next week, redeem his promise.—ED.]

PHOTOGRAPHY IN SOUTH AFRICA.

To the EDITOR.

SIR,—Some few weeks ago there was a paragraph in one of the papers stating that there were only "four good photographers" in South Africa.

At the present time there are *four good* ones in Cape Town, and several others of a lower grade. You will also find *good* photographers in Port Elizabeth, Kimberley, East London, Johannesburg, and all other towns of any size, and in some places the competition is as keen as in England.

Grahamstown, with a population of less than ten thousand, has about half a dozen, and you can scarcely find a village that has a population of over five hundred that has not got a photographer, or else is visited by the one from the nearest town or village at regular intervals.

There are also plenty of amateurs out here. There are five in this town, and yet this town (or village) has only a population of about a thousand whites.

Any one wishing to know the number of photographers out here can find out by referring to the *Argus Annual*, which can always be seen at the offices of the steamship companies.—I am, yours, &c.,

R. STEPHEN HILL.

Beaufort West, South Africa, November 20, 1892.

VOLUMETRIC TESTING OF ALKALINE HALOIDS.

To the EDITOR.

SIR,—In answer to F. C. Green I would say that Abney's statement (*Instruction in Photography*, p. 4) that the light affects only an "infinitely small proportion" of the sensitive compound gives one reason why, in the volumetric testing of bromide by means of silver, daylight need not be avoided. Another reason is the shortness of time required for the test. In gravimetric determinations of haloids by means of silver nitrate, or of silver by means of common salt, care should be taken not to perform the test in direct sunlight.—I am, yours, &c.,

December 9, 1892. J. H. PAYNE, F.I.C.

FUGITIVE IMAGES ON CELLULOID FILMS.

To the EDITOR.

SIR,—Under your "American Notes" in your issue of December 9, Dr. Charles L. Mitchell, speaking of celluloid films, refers to some of American manufacture being untrustworthy, and among other faults says, "They seemed to lose their image unless developed immediately after exposure." I have recently had a most striking example of this failure of films.

A gentleman recently returned from the West Coast of Africa asked me to develop a number of films he had exposed during some months of travel there. Before doing so I exposed a few (which he had brought home unused) in the studio for the purpose of testing the developer, &c., and they gave bold, vigorous negatives, clear and full of detail, while those exposed in Africa, although more carefully developed, gave only the most vague and ghost-like images, quite evidently the loss of power in the latent image. The pictures, thus practically lost were of great interest.

In view of the many advantages of films for work during travel, it would be well if the cause of this failure was made known, so that precautions might be made against it.—I am, yours, &c. P. HORSBURGH, Jun.

131, *Princes-street, Edinburgh, December* 9, 1892.

DIPPING-BATH DEVELOPMENT.

To the EDITOR.

SIR,—I am pleased to see in the last issue of THE BRITISH JOURNAL OF PHOTOGRAPHY some of the advantages of dipping-bath development mentioned. The dishes generally in use for the purpose bring such a large surface of the developer into contact with the air that its energy is wasted, and very many have to use sulphite as a preservative, a thing I strongly object to, preferring to use successions of fresh developers.

I have long been wishing that a dipping bath suitable for one, or for a few negatives at a time, were introduced, but, so far, have not succeeded in hearing of one. The obvious advantages are numerous, including (with a glass bath) the viewing of the negative by transmitted light without removing it from the dish, also that the negative can be left to itself to work up for a long period without rocking. Perhaps some provider of photographic materials would give the matter consideration.—I am, yours, &c., LOUIS MELDON.

Dublin, December 10, 1892.

WEST LONDON PHOTOGRAPHIC SOCIETY.—December 20, Technical Social Meeting.

PHOTOGRAPHIC CLUB.—December 21, *Amidol and Other New Developers.* 28, Monthly Lantern Meeting.

BRIXTON AND CLAPHAM CAMERA CLUB.—December 20, *In Spain with a Camera*, by Mr. F. P. Cembrano, jun. Public evening; invitation tickets from Hon. Sec.

WE are happy to hear of the engagement of Miss Catharine Weed Barnes, of New York, to Mr. H. Snowden Ward. Miss Barnes will still continue her editorship of the *American Amateur* and her other literary work.

THE next ordinary meeting of the Photographic Society will take place on January 10, 1893, when Mr. John Spiller will read a paper on two new developers, and Mr. H. Chapman Jones a paper on *A Chemical Study of Mercurial Intensification*. There will be no Technical Meeting this month.

THE Cleveland Camera Club will hold an exhibition and conversazione at the Co-operative Hall, Corporation-road, Middlesbrough, on Wednesday, February 1, 1893, when six medals, three silver, and three bronze, will be offered for competition in the following classes. Members only: 1. Set of six photographs (mounted on one mount). Open to all: 2. Single photographs (any subject). 3. Lantern slides, sets of six. Application for entry forms should be made to the Hon. Sec., Mr. J. J. Hallam, 11 Amber-street, Saltburn-by-the Sea.

Answers to Correspondents.

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & CO.," 2, *York-street, Covent Garden, London.*

J. P. (Wimborne).—Mr. H. N. King's offer was undoubtedly a genuine one.

ERNEST BASSETT.—Put the case in the hands of the Superintendent of Police in the town where the man lived.

F. PETERSON (Nottingham).—Fluoride of silver is not employed in photography, although its properties are known.

XYLOGRAPH (Surbiton).—The specification may be obtained at the Patent Office for eightpence when published.

C. W. FENTON.—If you continue to apply the ammonia solution to the precipitate (which is silver oxide), it will dissolve.

H. HEWSON AND OTHERS.—Thanks for the Imperial Portrait Association circular. We are tired of denouncing the scheme.

S. YEMENS.—Several formulæ for varnishes that are suitable for gelatine negatives are given in the ALMANAC, to which please refer.

B. R. T.—To prevent the glass stopper from again sticking in the bottle, clean it thoroughly and apply a little vaseline. Very little will suffice.

L. GILSON.—You will see that we have some remarks on brush development in a leading article this week. Thanks for the information on the other subject.

"An Old Hand," who writes us a letter *dpropos* our article of last week on "Recent Exhibitions," has, with the characteristic carelessness of "old hands," omitted both his name and address.

Several correspondents have sent us spotty prints, for the causes of which we must refer them to previous answers given in this column. Spots in prints have apparently once more assumed the dimensions of an epidemic.

J. Brier.—The thinner sample of tinfoil sent is too thin and very full of holes. The kind usually employed is of an intermediate thickness between the two samples. Any operative chemist will be able to supply what you require.

C. Rains.—As carbon tissue is now supplied in small quantities, sensitised and in the proper condition for use, you will do better, as a beginner, to purchase it in that state than to sensitise it yourself. Where a certain degree of proficiency has been acquired, then by all means sensitise it for yourself.

Nixon.—If the previous picture has stained the opal glass so that it cannot be cleaned, even with cyanide of potassium, the only way to remove the stain is to grind it out with emery powder or fine graining sand. Whether the value of the glass, now that it is so cheap, will repay for this trouble depends upon the value put upon time.

B. Symington.—If the photogravure is copyright, it would be legal piracy to copy any portion of it as a lantern slide, even were it only to illustrate a lecture on art. It is just possible, if you fully explain to the holders of the copyright the purpose for which the copy is wanted, they may accord you permission. Better write to the publishers.

S. W. says: "I have a pair of old stereoscopic portrait lenses and they both give equally as sharp images on the focussing screen, but in the negative one image, the left, is always much sharper than the other. Can you account for this?"—Yes. The reason probably is that in one lens the chemical and visual foci are coincident and in the other they are not.

West.—The arrangement shown in the sketch will answer very well for enlarging, but there will be a great loss of light, that is, an unnecessary quantity of magnesium will be required, owing to the length of focus of the condensing lenses. If they were half the focal length or a little less, they would answer the same end and economise magnesium.

T. Brain.—The precise position of the stop is not of vital consequence in your lens. The nearer it is to the lens, the greater will be the area of illumination, accompanied, probably, by a falling off in the definition at the margin. If this be so to any considerable extent, you can easily remove the stop to the position it occupied previous to its being sent for repairs.

D. McPherson.—It would certainly be bad policy, if nothing else, to exhibit a collection of portraits that have been rejected by sitters, however good the photographs may be, in a window or show-case. We can quite sympathise with photographers in the matter of the fastidiousness of sitters, but the step suggested would be very unwise from, at least, a business point of view.

Geo. S. Chase.—A method of making nitrate of ammonia which is much recommended consists in mixing a saturated solution of sulphate of ammonia with a saturated solution of nitrate of strontia. Sulphate of strontia falls as a precipitate, the nitrate of ammonia remaining in solution. The precipitated sulphate of strontia is reconvertible into the nitrate by means of dilute nitric acid.

H. B. says: "Your correspondent, 'Devonshire,' will find what he wants in the Almanac for 1892, page 572: 'An Imperishable Mountant,' by the Rev. J. Carter Browne, D.D. I send you a photograph I have just printed, with particulars at the back of lens, formula, &c. How do you think amidol has answered as developer?"—The print sent by our correspondent is a truly excellent one, definition, exposure, printing, &c., being faultless.

Amateur (Warwick) writes:—"In formulæ, water, sixteen ounces, and water, one pint, are often written; are not the two synonymous? Is not a pound of water and a pint of water the same quantity? That being the case, why this confusion in writing quantities?"—Our correspondent is under a misconception, a pound of water and a pint of water are not the same; the former is sixteen ounces and the latter twenty, or a pound and a quarter.

W. S. B.—If the premises were taken on a repairing lease, the landlord cannot be expected to do any repairs to the studio, any more than he is to any other part of the building. The fact that the studio was "slop-built" does not matter. The tenant ought to have satisfied himself as to the condition of the premises at the time he agreed to take them. Having signed the lease, we expect he will have to abide by its conditions, whatever they may be.

J. A. Biggs.—Place the two large lenses *much* closer together than shown in the drawing, and both with their flat sides next the light. Let the carrier for the negative be nearer the condenser, and use a ground glass or opal only if the illumination of the negative is unequal. The lamp will have to be placed a considerable distance from the condenser, this distance being ascertained by seeing that the cone of light passes through the enlarging lens in front.

B. Morris writes: "I find a difficulty in keeping bromide paper flat and even while enlarging, particularly when it has been kept in a warm room. Would there be any injury to the resulting picture in the matter of sharpness or in other ways if the paper were pressed in contact with the board with a sheet of glass?"—Practically, there would be no loss of sharpness or other deterioration by adopting the method suggested. The glass must be perfectly clean, free from scratches, air-bells, and other defects; otherwise they would be rendered in the picture.

A. J. says: "I am much troubled by a difficulty in mounting. I have tried starch and dextrine, and find that, whilst most of the pictures adhere well, some of them will always leave the mounts a little at the edges, and will come off more still when burnished. Could you suggest what is likely to be the cause?"—It is pretty obvious that the mountant is not evenly applied. The edges are not sufficiently coated with the cement. It is necessary that a good coating of the cement, whatever it may be, is applied to the extreme edge of the print, or the trouble complained of is sure to be experienced.

Noel B. Kenealy says: "May I venture to ask if any of your readers can help me out of a difficulty? I have been trying for months to make some collodion dry plates (not emulsion), but have hitherto failed. I shall be glad to hear from any one who has practically worked the process, and, as a successful result will mean a good deal to me, I shall not be ungrateful. My plates have always lacked evenness and density, and I must have a very black and white result."—Our correspondent evidently refers to collodion preservative processes, of which he will find every particular in former volumes of this Journal and its Almanacs.

B. J. Burridge.—A four-and-a-quarter-inch condenser is not large enough to illuminate a quarter-plate negative, hence the cause of the dark corners in the picture. The defect is not due to the lens or to the light as surmised, but simply because the condenser is not large enough for the work. For enlarging, to secure even illumination, the condenser must not be less in diameter than the diagonal of the negative to be enlarged. That, in the case of the quarter-plate size, is nearly five and a half inches. For perfect illumination, taking marginal imperfections and the mounting into consideration, a six-inch condenser is preferable to the size mentioned.

F. E. G. writes: "Herewith I beg to enclose cabinet photograph on P. O. P., on which you will observe a number of faint dark spots which appear when put through the hot burnisher. It is not impossible that these marks are on before burnishing, but the heat probably makes them more visible. I have had quite a dozen this last fortnight, and would be glad to find the cause of them. It does not come from the negative, as good prints are got from same negative. The prints are never allowed to rest in fixing bath."—The spots appear to be due to imperfect fixation. Probably air-bells attach themselves to the surface of the paper, and thus prevent the free action of the "hypo" at those parts. There is little question that the spots are present before the burnishing, but they are rendered more manifest by the operation. The burnishing is certainly not the cause of the defects.

Mr. Jonathan Fallowfield has been appointed London wholesale agent for Wood's Washer Company.

We have received the new catalogue of the Thornton Pickard Manufacturing Company, which contains particulars of several new items, including the snap-shot shutter, a new safety blind, a new dark-slide recorder, the improved focal plane shutter, &c. The illustrations of pictures taken with this and the "Instantaneous and Time" shutter are capital testimonials of the efficiency of those instruments. This little catalogue contains many hints of use to shutter-users.

The Woolwich Polytechnic Photographic Society will hold an exhibition of photographs and apparatus in the Large Hall, Woolwich Polytechnic, on Thursday, Friday, and Saturday, February 16, 17, and 18, 1893. The Judges are Messrs. F. P. Cembrano, A. R. Dresser, and A. Pringle; and the following are the sections:—1. (For members only), Prints, any subject by any process. 2. (For members only), Lantern slides, best set of six, any subject. 3. Open to all amateurs, any subject by any process. 4. Open to amateurs who have never received an award in open exhibition. 5. Lantern slides, open to all amateurs, best set of six. 6. Hand camera work, set of four prints taken with camera held in the hand, not on a tripod (enlargements debarred). A gold medal, presented by the Right Hon. the Earl of Carrick will be presented for the best picture in the Exhibition, and silver and bronze medals and certificates in all classes, will be placed at the discretion of the Judges.

FORTHCOMING EXHIBITIONS.

1893.		
February 1	.....	*Cleveland Camera Club. Hon. Secretary, J. J. Hallam, 11, Amber-street, Saltburn-by-the-Sea.
,,	7, 8	Rotherham Photographic Society. Hon. Secretary, H. C. Hemingway, Rotherham.
,,	16–18.....	*Woolwich Polytechnic Photographic Society. Hon. Secretary, W. Dawes, 145, Chesnut-road, Plumstead, S.E.
,,	18.....	Holborn Camera Club. Hon. Secretary, F. J. Cobb, 100 High Holborn, E.C.
March 1, 2	.....	*Fillebrook Athenæum Photographic Society. Hon. Secretary, Joseph W. Spurgeon, 1 Drayton Villas, Leytonstone, Essex.
April 17–29	.....	*Photographic Society of Philadelphia. Hon. Secretary, R. S. Redfield, 1601, Callowhill-street, Philadelphia, U.S.A.

* Signifies that there are open classes.

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1703. Vol. XXXIX.—DECEMBER 23, 1892.

A TELESCOPIC FOCUSSING FINDER.—II.*

The problem now to be solved—and it is happily one of extreme simplicity—is the application of the telescopic focusser to a camera in which more than one lens is to be used.

We have said that the object-glass of the telescope should be identical in focus with that of the photographic lens employed. Seeing this is to be the case, it follows that the object-glass in question must have a variable focus. This was foreseen at the time the appliance was first made and publicly shown. To the original one we had independent object-glasses adapted, these being respectively of eighteen, fifteen, and twelve inches focus, to suit the photographic lenses attached to a particular camera; but a much less costly alternative presented itself. This was to have only two object-glasses for the telescope, these being worked in conjunction.

One was fixed at the end of the body in the usual manner in a screwed cell. The other was similarly attached to a short bit of tube, which was made to travel easily from end to end of the main tube. By means of a longitudinal slot in the body and a projecting button, this inner lens was capable of being run from one end to the other, either close up against the primary or fixed object-glass, or comparatively near to the eyepiece end.

Now, according to the distance that one of these object-glasses is from the other, so does the focus vary. If each of them were of twenty-four inches focus, then, when placed close together, the combined focus would be twelve inches—that is, if we could suppose them to be infinitesimally thin. What we have to note in this instance is, that the farther they are separated from each other the longer becomes the focus.

The determination of this is effected by a rule which we quote from what we have elsewhere written. It is: "Having ascertained the focus of each of the object-glasses, multiply the focus of one lens by the other, and divide this product by the focus of both added together, less the distance of separation. The quotient is the focus sought for."

From this it will be seen how easy it is, having a combination objective in the telescope, to alter its effective focus to anything within reasonable limits that may be desired. Suppose that the primary focus of the telescopic objective is twenty inches, and that a supplementary lens set in the running or adjustable short tube is twelve inches, and it was desired that the combined focus should be eight inches, so as to suit a camera lens of that focus, then by the foregoing rule it would merely suffice that they be separated two inches, for—

$$20 \times 12 = \frac{240}{32 - 2} = 8 \text{ inches.}$$

in which the foci, when added together, give, minus two inches (those of separation), 30, the divisor for 240 (the product of multiplication of the foci), giving eight inches as the equivalent focus desired.

The same result may be arrived at by "trial and error," a system which some photographers may prefer to adopt. In any case, when the focus of the telescope is, by moving the running piece of tube round, to assimilate to that of any of the variety of lenses that it is intended to use with a particular camera, let an index mark be made on the outer tube to correspond with a like mark on the button, and by this means one will be able to play with the original telescopic focus to any extent.

We would not for a moment recommend this system for adoption, when a telescope is to be employed as such, for giving the acme of definition; for in such a case, and for such a purpose, it should be left in its native entirety; but, for the purpose now being advocated, it will answer exceedingly well. Nay, we find that, at a pinch, an uncorrected or single-glass lens, if edged down, may be made to subserve the purpose of the necessarily more expensive achromatic lens in the running or adjusting tube.

In conclusion, note that the shortest focus is obtained by placing the objectives close together; by separating them, the focus is lengthened.

* Concluded from page 802.

FIXING AND FIXING AGENTS.

The operation of "fixing" negatives or prints is too often regarded as one that requires little or no care beyond that involved in ensuring the complete removal of the unaltered silver salts—in other words, the sensitive material that has not been reduced either by the direct action of light or by the developer. Beyond this, which in itself is not a difficult matter, there are certain precautions to be observed in regard to the removal of the fixing salt itself, as well as of the products formed in the process; but these are well understood, and there, so far as the majority of workers are concerned, the matter ends. But there are other points to which it may be well to call attention.

The term itself has been objected to as a misnomer, since the removal of the unreduced haloids in no way affects the image already formed, or should not do if proper treatment is adopted; but, since age has sanctified it, we may still continue to employ it, and to consider as fixing agents any salts that are capable of dissolving iodide, bromide, or chloride of silver without materially acting upon the reduced metal forming the image.

At the present day sodium hyposulphite or thiosulphate reigns almost supreme as the fixing agent both for negatives and prints, but many other substances have been employed at various periods. In very early times iodide of potassium, chloride of sodium, and ammonia were used, according as the

sensitive material was iodido or chloride of silver, until "hypo" was found to be a better and more energetic solvent. Then cyanide of potassium came into use with collodion, and became the almost universal fixing agent for both negatives and positives. Later on, the alkaline sulphocyanides were proposed in place of hypo for fixing albumen prints, and in comparatively recent years chloride and sulphite of sodium have been put forward for the same purpose.

The merits and demerits of these various agents will be better understood if we consider for a moment what takes place in the process of fixing, or at least a portion of what occurs. The silver haloid in the course of removal is converted into a soluble double salt, in which condition it is particularly liable to act upon any organic matter with which it may be in contact, as, for instance, collodion, gelatine, albumen, or paper, one or other of which must necessarily be present in negatives or prints. The longer the fixing process lasts, the greater is the danger arising from this cause, hence the desirability of using a solvent that will remove the unaltered haloids as quickly as possible.

Few of our readers, we imagine, are unaware that, though paper or linen moistened with a solution of nitrate of silver may remain colourless for a time, it will eventually blacken without exposure to light; but perhaps it is not so well known that chloride or bromide of silver, dissolved in any of the fixing solutions mentioned above, will produce a similar, if not identical, result. Allow, for instance, a few drops of fixing solution from a print or negative to fall upon a sheet of white blotting-paper or linen, and in a few days or weeks an indelible stain will be the result, varying in intensity with the state of concentration of the solution, so far as concerns the quantity of silver it contains. If the paper or linen be at once washed in plenty of water, or before discolouration occurs be treated with a fresh solution of hypo, the stain will not appear, or, if it should, will be far less apparent, its intensity depending upon the thoroughness of the washing or the length of time the fixing solution is allowed to act.

In the case of a solution possessing comparatively little solvent action upon the haloid, it is clear that the negative or print will be subjected to the action of the soluble silver salt for a considerable time, and, what is worse, in the case of such salts as iodide of potassium or chloride of sodium, the dilution caused by washing is liable to throw down some of the silver in a more or less insoluble form. To avoid eventual discolouration with such fixing agents, it becomes, therefore necessary to employ a considerable volume of concentrated solution, which, added to the inconveniences of their tardy action, places them practically out of competition with hypo. The same fact prevails, as is well known, even with hypo, though, owing to the much greater solvent action of the latter, it is not so much felt; for if from using too weak a solution, not allowing it to act long enough, or attempting to fix too many prints or negatives in a given quantity, its strength be over-taxed, the inevitable result will be ultimate discolouration from formation of the unstable double salt.

The introduction of the sulphocyanides some quarter of a century back as fixing agents for silver prints was expected to do away with the trouble arising from fading and sulphuration of hypo fixing; but, unfortunately, the innovation did not prove a success, for the reason, as alleged at the time, that, though the unaltered chloride of silver might be removed, the albumenate was not. At any rate, the sulphocyanides have never been generally adopted. Similar objections were made to the use of chloride of sodium and sulphite of sodium when, a few years ago, it was proposed to substitute those salts for the hyposulphite, and, though we have in our possession some gelatino-chloride prints fixed with chloride of sodium several years ago which still retain their pristine brightness, there can be little doubt as to the immeasurable superiority of hypo, either for albumen or gelatine prints or films.

Cyanide of potassium, the once all but universal fixing agent for negatives, owes its replacement by hypo to other causes. In the first place, it is a powerful solvent of metallic silver, and therefore exercises an injurious action upon the developed image. In the days of wet collodion, when the sensitive film consisted mainly of iodide of silver, the ready solubility of the latter rendered it possible to use a solution of so low a strength as to have practically no injurious effect upon the image; while, for glass positives or ferrotypes, a slight action upon the metallic deposit had a distinct advantage in clearing the shadows. But, upon the introduction of simply bromised collodion, and subsequently of gelatino-bromide films, the superior solvent power of hypo for silver bromide, and the absence of any injurious action upon the image, threw cyanide of potassium altogether out of use.

There cannot be the shadow of a doubt that at the present day hypo is not only the best, but the only practical, fixing agent we have either for negatives or prints, however much it may be objected to on the score of some of its properties. It has been pointed out over and over again in these and other columns that much of the blame supposed to attach to hypo is really due to its misuse, and that, though the want of want of permanence alleged against silver prints generally has been laid to its charge, the fact still remains that many prints are still in existence without any symptoms of fading that were fixed with hypo thirty or forty years ago. Albumen, it is true has had a share of the blame cast upon it as helping towards, the want of permanence, but it is questionable whether the greater danger does not exist at the present day in connexion with gelatine.

The rapid discolouration or yellowing of so many gelatine prints both developed and direct is, no doubt, much of it due to imperfect fixation or insufficient washing; but at least some of it may, we think, be charged to over-fixing, or allowing the prints to remain too long in the hypo solution, especially when a considerable number are treated in the same quantity of solution. In such cases the fixing bath becomes converted into, practically, a solution of silver capable of forming an organic compound with the gelatine, and this, in the absence of a sufficiency of hyposulphite to retain it in the soluble condition, remains to cause the gradual discolouration of the print, although it may not be immediately apparent.

We know that, if a sheet of clear gelatine be soaked for a short time in a solution of silver nitrate, no amount of simple washing will suffice to prevent the subsequent discolouration of the gelatine, even if kept in the dark, while exposure to light will bring about the rapid reduction of the organic compound. If such be the case with a perfectly soluble salt like the nitrate, how much more likely is it to happen with the double hyposulphite formed in the fixing bath under the circumstances mentioned, prone as it is to decomposition into insoluble compounds.

The matter is easily tested by immersing a gelatine print, or, better still, a leaf of plain gelatine, in a perfectly colourless fixing bath well charged with silver, and, after a very thorough washing, allowing it to dry. In the course of a short time the

gelatine will be found to have acquired a decided tint, readily apparent when compared with a similar leaf untreated. If a portion of the gelatine be immersed in fresh hypo before the final washing, the part so dipped will remain unchanged, or show a much slighter colouration, on keeping. A print or negative left for a few hours in the fixing bath will acquire a distinctly, and sometimes a very marked, yellow colour, although the bath itself may be quite colourless, especially if several prints have been already passed through it.

The importance of using a fresh bath and plenty of it cannot be too strongly urged upon all producers of gelatine prints, and also of not allowing them to remain too long a time in the solution. As an additional safeguard, the practice of finishing off in a second and clean solution is one that can be recommended.

DIFFUSED LIGHT.

This subject, which embraces issues of the highest importance in photographic technics, has recently been treated very definitely, and from an exact standpoint, in a paper by Dr. W. E. Sumpner, read before the Physical Society. We purpose drawing upon the facts and data he then brought forward, but will first briefly survey the field covered by the subject. The paper has a more particular reference to indoor or otherwise restricted illuminations, hence a mere reference will suffice for that diffusion of light which plays so important a part in the various effects seen in nature, according to the extent and the direction of those media—clouds, atmosphere, and spacious reflecting areas generally—whose action makes or mars the possibility of pictorial treatment.

The first effects that would naturally present themselves to the investigator would be those met with in studio work. And very largely will they be seen to act. The light enters the studio through a given area of glass, but a little consideration will show that of the light entering such area a very small fraction only falls direct upon the sitter and the portion of his surroundings that ultimately appear in the picture. What, then, becomes of the rest? It is partly absorbed, partly reflected and diffused, a portion of the latter amount being again received by the sitter. Here, *en passant*, it may be remarked, is seen the advantage of electric lighting for portrait studies. When suitably used, almost the whole of the acting light is directed upon the sitter. The rest of the studio is in darkness, and so small a portion of the air has rays of light passing through it, that even on a foggy day, with fog in the studio, presentable portraits may be taken, when all-round daylight illumination would give worthless results.

Returning now to what may be termed the secondary light—the portion not radiating directly upon the sitter—we find a portion utilised and a portion wasted. It is almost a truism to say that, for the sitters' comfort and the quality of the negatives taken, all light not thrown upon the subject is worse than useless. Then we have to consider surfaces specially contrived—screens erected for the purpose of diffusing light. The light from a particular direction is considered too strong; it can be diffused by interposing a temporary screen of some translucent woven material, of tracing paper or cloth, by coating the glass with a diffusant, or, finally, by glazing with "ground glass." The respective values of these substances have never been given to the world, but Dr. Sumpner's paper gives many such data. We have to consider non-utilised light—light that enters the windows of a studio, but is of little or no value for the sitter's requirements. If the value of a diffuser is known, a suitably selected one may be placed in the path of the useless rays, and cause them to be diffused, a portion of them being thrown upon the sitter.

White or pale-coloured screens are employed as subsidiary illuminants, by reason of their diffusing properties, and, if the actual value of the various possible surfaces were known, it would not be difficult so to devise a screen that the maximum diffusion with the minimum incident illumination could be obtained.

Turning next to the dark room, it is quite evident that, when the popular coloured papers or cloths are made use of to give the proper colour to the light, there is not five per cent. of it used for lighting up the plate; by far the major portion is diffused, and lightens up the room itself; but, as far as regards the plate, one-fifth or one-tenth of the light (and concomitant heat) would illuminate the developing dish equally well, if the laws governing the diffusion of light were understood and their teachings utilised. The effects of diffusion, again, may be noticed from the walls of the room. Thus, of the light from the lamp or gas, there will be plenty of diffused illumination from the walls of the room. The particular illumination of a negative, for example, will depend upon its distance from the source of light, and whether or no a light-diffuser intervenes. If a pigment which only reflected red light could be found, and the walls and ceiling of a dark room were painted with it, there would be monochromatic diffusion, and a naked gas flame might be safely employed if an opaque object were interposed in the path of the rays from it to any uncovered sensitive plates.

If we next take into consideration the printing-room and its accessory aids, we shall find diffusion playing an all-important, but completely ignored, part, leaving out of question diffused skylight, for few printers use direct sunlight. There will be seen tissue paper to diffuse, cotton-wool to diffuse, vignetting glasses, cardboard, or other perforated screens, and many similar contrivances, all to take advantage of light so treated. But in all cases the treatment is empirical. It must often be so; but occasionally exactness would be a boon. The direction in which to look for this is indicated in Dr. Sumpner's paper, fuller details of which will be abstracted for a succeeding article.

A New Style of Portrait Wanted.—A correspondent, writing anent the depression of trade amongst professional portraitists, suggests that a new style of portrait should be introduced which amateurs could not produce. He says that "if such a thing were done, and it took, the trade would revive, and would then be entirely in the hands of the profession." The idea of a new style in portraiture is excellent, but the writer omits to say, or even to hint at, what kind of picture there is, or ever will be, that is beyond the scope of an amateur to produce. We await information on the point.

The Magnesium Light.—The application of powdered magnesium as a source of light for photographic purposes is by no means such a modern invention as some seem to suppose. So far back as 1865 it was used; and in that year Mr. H. Larkin obtained a patent for a lamp for its combustion. The lamp answered well, and we were present when some very good portraits were taken by its aid. In this lamp the powder, mixed with a certain proportion of fine sand, was made to pass through the flame of a spirit lamp, or one of gas, which ensured its combustion. The chief reason why the lamp was not much used was the then prohibitive price of magnesium.

A New Application of Photography.—According to one of our contemporaries, whose special sphere is dress and fashion, some West-end milliners are sending out to their customers photo-

graphs of bonnets and hats of the latest design, from which they can select. The suggestion is made that, in preference to this system, the ladies should send their portraits to the milliners, and allow them to use their judgment as to the *chapeau* and trimmings that would best suit the face. The idea certainly bears the stamp of novelty. We should certainly advise the milliners, in using their judgment, to err on the side of supplying the article quite in unison with the youthfulness of the "highly" retouched photographs of some middle-aged ladies, than otherwise, or it may not give satisfaction. But there, the fashionable *modiste* requires no "tips" from photographers on this subject.

Stained Prints.—*Apropos* of the subject of spots of a mysterious nature that seem to make their appearance periodically, there are certain stains that may be said to do the same. These, too, may be attributed to the season, and they are not confined alone to albumen prints, but extend also to gelatino-chloride printing-out paper. In a sense they may be classed as "spots," though stains would be a more appropriate term. When an albumen print is transferred from a solution of one temperature to that of another, it is often noticed that air bells will adhere very tenaciously to it; consequently the surface is for a time protected. If this occurs in the toning bath, stains or unequal toning will occur; if in the fixing bath, uneven action of the hypo, resulting in yellow spots. To some kinds of gelatino-chloride paper air bells seem to adhere more tenaciously than to albumen paper; hence they must be guarded against. There is another cause of stains which has often been pointed out, and is well known to experienced workers, namely, the slow action of the fixing agent at a reduced temperature, and that a longer time for fixation is necessary. But this has been so frequently dwelt upon that it need not be further alluded to.

Spots.—The spot epidemic appears to have set in with unusual severity this winter, if we may form an opinion from the number of letters received on the subject during the last two months or so. It has been noticed for many years past that "mysterious spots" on silver prints are more prolific during cold weather than at other times. On previous occasions we have directed attention to the fact that an often unsuspected cause of spots is floating particles of pernicious matter in the atmosphere in the form of dust. In winter, when the work-rooms are artificially heated, the atmosphere becomes very dry; consequently, when the floors are swept, considerable dust—which is generally composed in great measure of the chemicals in daily use—is raised, the finer particles of which take a long time to settle, and, if they alight on wet or damp prints, which are usually in course of drying or mounting in the ear part of the day, when the cleaning is done, they will have their effect. A particle of hypo, bichloride of mercury, &c., settling on a moist print, would eventually cause a spot. The sulphurous dust, too, from a coke stove also has a very pernicious effect, and is sometimes a prolific source of spots. By way of experiment, we have allowed some to settle on a moist print, with the result that in a few days it was covered with spots very similar in appearance to some of those on prints that have recently been sent us.

Sale of Poisons.—Dealers in photographic materials need be cautious just now as to the selling of some of the chemicals used in the art. According to the Pharmacy Act, some of them can only be vended by duly certified pharmaceutical chemists. The Pharmaceutical Society is very jealous of any one trespassing on its domains—the chemist's and druggist's business—and at present, as it is occasionally, it is active in prosecutions. Last week it proceeded against some grocers for penalties for selling a bottle of proprietary medicine—Dr. Collis Browne's chlorodyne—because it was said to contain opium, one of the poisons scheduled in the Act. The decision was in favour of the Society, but it is to be appealed against on technical grounds. The Judge, in his summing up, is reported to have said: "It seemed to him almost too clear for argument that a poison, however mixed up with other things, did not cease to be a poison." No one who has the slightest acquaintance with it will fail to be amused at Judge Bateman's idea of chemistry. Fortunately, there are only a few of the chemicals used in photography that are named in the schedule, amongst which may be mentioned bichloride of mercury and cyanide of potassium. These it is illegal for any one but a fully qualified pharmaceutical chemist to sell, and then only when certain formalities are gone through both by purchaser and seller. Of this there is no question. Wholesale dealers may, however, sell these, and other materials, in wholesale quantities without hindrance. Hence there is less difficulty in obtaining a few pounds than an ounce or two of some things.

ELECTRICAL ACTION IN DEVELOPMENT.

In a recently published number of *L'Amateur Photographe*, Mons. L. Mathet describes some experiences of electrical action in the development of celluloid films. He noticed in developing some films of his own preparation a phosphorescence-like appearance on the surface of the negative; a phenomenon which also appeared when he repeated the experiment with rollable films of commercial manufacture. The circumstances under which the phenomenon appeared in the latter case were as follows:—The films were developed in an ordinary vulcanite dish, with pyro-soda. While flowing the developer to and fro over the film he clearly noticed, he says, a phosphorescent gleam upon its surface. When development was complete the developer was removed, the film allowed to adhere to the bottom of the tray, and flooded with the wash water, when the mysterious light became even more apparent. The negative, when fixed, was slightly veiled. Substituting a hydroquinone developer for the pyro-soda with other exposed films, the same "phosphorescence" appeared, and subsequent slight fogging also supervened.

M. Mathet regards these experiences as confirming the conclusions of Colonel Waterhouse (see the last volume of this JOURNAL) that an electro-chemical action is producible during development; but in M. Mathet's case this action is made apparent by the nature of the support. That gentleman, however, points out, what, of course, is tolerably well known, that celluloid is a bad conductor of electricity. When talced glass is coated with a solution of celluloid in amyl acetate and the dried film is stripped, a shower of small electric sparks is evolved between the detached film and the glass at the moment of separation. The pellicle, however, retains its electrical properties.

In coating large surfaces of rollable celluloid films M. Mathet points out a fact which we remarked upon some years ago, although the statement encountered the dubiety of an experienced dry-plate maker, that this non-conducting property of the celluloid may lead to the fogging of the superposed emulsion, the entire surface being fogged, and the discharge becoming visible on development. M. Mathet is inclined to think that the same phenomenon is the cause of the several small stars with which some of his film negatives were disfigured. He quotes the case of a commercial film which, upon development, showed a dark spot around which were formed certain regularly defined luminous radiations that he also sets down to the same cause.

M. Mathet states that if the celluloid film be coated while on a metallic surface, instead of a glass plate, as is generally used, sparks are produced if the film is forcibly moved in contact with the metal, and especially if the air be dry, while they may be avoided if the atmosphere be humid and care be taken to remove the pellicle carefully, and placed in contact with some inert material. Such facts are no doubt thoroughly known and understood by commercial manufacturers of celluloid films. The interesting point in M. Mathet's communication lies in what he regards as a confirmation from his own experiences, that, as Colonel Waterhouse and others have already discovered, an electrical action is produced in development. It should, however, be pointed out that in Colonel Waterhouse's experiments, if we remember aright, no sparks of electricity were visible.

JOTTINGS.

I AM glad to observe, from the reports lately published in your columns, that the Photographers' Benevolent Association, under its new Hon. Secretary, Mr. Snowden Ward, gives promise of entering upon a career of greater usefulness than it has hitherto enjoyed. The times are hard, and so soon as it becomes known amongst indigent

photographers and assistants that the Benevolent is anxious to extend a helping hand to those in need of it, I have no doubt that it will receive numerous applications for aid. But, alas! how many of those who seek its assistance in the hour of trouble can allege the inexpensive qualification of membership as a claim upon its consideration? Very few, I fear. The improvidence of actors is notorious, but, to judge by the paltry manner in which the Benevolent Association is supported by photographers, the latter are formidable rivals of the histrions. Surely it is time that each individual photographer in the country made an effort to remove this stigma from his profession. Come, gentlemen! A modest half-crown is sufficient to make you members of an Association to which one day you may be glad to turn for a "lift," and the name and address of the Hon. Secretary is, Mr. H. Snowden Ward, Memorial Buildings, E.C.

Having started these Jottings in a benevolent mood, and recognising that we have arrived at the so-called festive season of the year, I suppose I must bottle up for future use several choice growls which I had intended venting in this column just now. Never mind; I will keep them for next month—the Month of Growls, when the rent and the rates and the taxes and other impositions to which the inoffensive citizen is liable fall due. Still, I can't resist the temptation of mildly remonstrating with all concerned in the production of the new volume of The British Journal Photographic Almanac, for having made the book so big. If it were not that the pictures were so nice, the articles so practical, and the advertisements so interesting, I don't think I could forgive Messrs. Greenwood the piece of inexplicable philanthropy of selling for a shilling what is honestly worth five. When Macaulay's New Zealander comes over to sketch the ruins of St. Paul's from London Bridge, he will not improbably find a huge object in his line of sight which will prevent him seeing the dome. That object will, at its present rate of progression, be The British Journal Photographic Almanac of, say, A.D. 2000.

Nay, good "Immature," I am neither the champion of "scientific experts" as Judges of photographic exhibitions, nor of the other variety which seeks to ape in the camera the wildest eccentricities of Jemmy Whistler. I simply wanted to know why it is that "scientific experts" are now so vehemently objected to by certain persons as Judges, while for more years than you or I may care to count, their awards were cheerfully accepted, and (mark this!) intrigued and begged for. As you cannot, I will answer my own question. It is all on account of —not Eliza—but of the revolt of a reputable Society against privilege, impertinence, and favouritism (*vide* this Journal of December 11, 1891, pp. 798, 9). In those two pages you may find the *fons et origo* of the lofty contempt for "scientific experts" and of the Photographic Society of Great Britain which has since been the parrot cry of a handful of egotistical and disappointed photographers.

I am an old member of the Photographic Society of Great Britain, and I trust the time will never come when I shall see it go under, or merged into any new-fangled mushroom-growth brought into ephemeral existence by cliquism and self-seekers. The roll call of the Society is one that bears comparison in weight of artistic and scientific knowledge with any other photographic society in the world, and though up to a recent period that Society has been inclined to regard somnolence and dignity as convertible terms, I think every impartial man will feel assured from its recent renaissance, that whatever ground it may have lost will be recovered, and that before long it will have reasserted its right to be considered in esteem, as well as in title, *the* Photographic Society of Great Britain. I hope, as I believe, that I shall not see the day when it will be otherwise.

Such being the case, good "Immature," your thrust at the Editor of this Journal for suggesting that the Society should appoint a committee to deal with the Exhibition and Medal Question smacks both of prejudice and of the precocious effrontery of youth. To call the Society "dead" and an "abstraction" is a juvenile exaggeration at which those who know anything about the Society just now will smile. Again, the same writer, in falling foul of some remarks in the article on "Recent Exhibitions," seems to be rather disappointed that it did not settle the whole vexed question to everybody's entire satisfaction within the space of about a column. His own remarks, by the way, are singularly deficient of suggestions, practicable or otherwise. Destructive criticism, you see, is so much easier than the constructive variety. As to the whole question of exhibitions and the awards: I am not much interested in it; but for the sake of impartiality I should think it would be wiser if Judges and exhibitors had less to say in the matter than is the case.

What is this projected new photographic society about which these mysterious paragraphs are appearing in the photographic press just now? Surely the originators, whoever they may be, might communicate a few details to a wondering and mystified public. As I see some prominence is to be given to the usual club comforts, I suppose the promoters are jealous of that admirable body the Camera Club, and are seeking to run a cheaper show on beer-and-billiard lines, with a little photography thrown in as a sort of clarifying *raison-d'être*. I myself don't think there is any room for a new club, or institute, or society, or whatever this affair is likely to be called. London is well supplied enough with photographic societies as it is, without increasing the number. Far better let the promoters join existing institutions, and seek to strengthen them, rather than court contumely by bringing a new body to life which must be foredoomed to an early and ignominious demise. But, at any rate, why all this secrecy?

A recent correspondent was told that iridescent markings round the edges of gelatine plates are due to the plates being old or stale. Not always. I once had a few dozen plates direct from a maker which had only been made ten days, and they gave about as fine a sample of iridescent marking as I had ever seen.

Let me, in concluding my "Jottings" for the year, wish all my readers—whether they be among the "flayed" or the "unflayed"—a merry Christmas and a happy New Year, in the most humane and agreeable meaning of the term. Cosmos.

NOTES ON THE NEW AMIDOL AND METOL DEVELOPERS.

[Journal of the Photographic Society of India.]

I lately received small supplies of these new developers, and, though I have not been able to examine them fully, the following short notes may be of interest.

Amidol appears in small crystals, with a peculiar grey, silvery appearance. It is readily soluble in water, but the solution quickly discolours in the air. It is only slightly soluble in alcohol, the solution turning a pale yellow colour. It is a form of di-amido-phenol with the formula $C_6H_3\overset{OH}{(NH_2)^2}$. Ferric chloride turns the solution a deep crimson. Bichromate of potash turns it a brownish red, and a precipitate is formed in standing. Bromine water turns it red, the colour fading very much on standing. Potash permanganate turns it a deep crimson, becoming brown and muddy after a time. Alkalies turn the solution green. With carbonate of lithia and ammonia the green colour darkened, and then gradually became a bright yellow, which afterwards darkened. I have not noticed any fluorescence in the solutions after development, as is the case with many of the new dry-plate developers.

The peculiarity of amidol as a developer is that it can be used without alkali; by itself it is only a very weak developer; with alkalies it gives weak images, very liable to stain; but in solution of 5 parts in 1000 of water, with 50 to 100 parts of sodium sulphite, it becomes a very energetic developer, giving good density and detail with very short exposures. According to Dr. Eder, the addition of sodium sulphite increases its activity, and the ordinary proportion may be doubled.

The formula recommended by the maker is—

Amidol	20
Sodium sulphite	200
Water	1000

Diluted with from 2 to 3 parts of water.

This, when freshly made up, is an excellent and powerful developer

The solutions, however, whether concentrated or dilute, darken and lose their efficiency and developing power. I think I have found what may be a remedy for this.

During the year I have been making observations of the behaviour of various developers when electrolysed in a voltameter with platinum or silver electrodes, and one of the earliest experiments with amidol was to test it in the voltameter with platinum electrodes, passing the current from two pint bichromate bottle cells through a solution made up as for developing. The E.M.F. of the two cells was about 4 volts, but was reduced to about 1·5 volts when passing through the solution in the voltameter. In twenty minutes 1·4 c.c. of hydrogen were given off from the cathode, which is rather below the average of other developers with the same battery. The anode became surrounded by a dense, deep yellow solution, but otherwise the liquid in the oxygen tube did not change colour. The cathode had a tendency to keep coated with bubbles of hydrogen, but the colour of the solution in the hydrogen tube was unchanged. At the conclusion of the experiment, the solution, which was slightly yellow, was put away in a bottle; and it was observed that, whereas some of the same developer which had been used and put away and also the stock solution became very much discoloured, this electrolysed solution remained quite clear and colourless. Moreover, whereas the dilute ordinary developer which had been kept six days was found to have entirely lost all power of developing, the electrolysed solution (A) which had been kept for four days was found to work with even somewhat more vigour than a fresh solution. Not only so, it retained its freedom from colour and its developing powers for some time longer, even after use, as noted further on.

In a second trial some discoloured stock developer was taken and diluted with three parts of water, and then electrolysed in the same voltameter with the current from 4 gravity Daniell cells. The strong solution had a deep orange-red colour, but on adding water it took a claret colour. The E.M.F. of the battery was about 4·4 volts, which was reduced in the voltameter to about 3·7 volts, the current being 12 milliampères, with a galvanometer resistance of 100 ohms. In this case the evolution of hydrogen was much brisker. In 10 minutes 1·2 c.c. of hydrogen were given off, in 20 minutes 2·6 c.c., and in 30 minutes 4·1 c.c. The solution in the hydrogen tube became quite decolourised, while that in the oxygen tube gradually took an orange colour. The colour of the solution generally remained of a claret colour; and when the tubes had been removed, the current was allowed to pass directly through the solution, and gas was given off fairly freely at both electrodes. At the conclusion of the experiment this solution was also bottled off, and gradually took a pale orange colour. It was used for developing nine days after electrolysis, and showed very strong developing powers. With a Steinheil antiplanet lens 7½ inches focus at about *f*-10, and two turns of a Thornton-Pickard shutter, a Wratten instantaneous plate was found to be greatly over-exposed; but a good negative was obtained when the aperture was reduced to about *f*-15, and the tension of the shutter increased to three turns. It was found, however, that the still older solution (A), electrolysed with the bichromate battery about three weeks previously, which had much less colour, had still stronger developing powers, *i.e.*, it gave a denser image. On the other hand, a fresh normal solution at 1 to 3, made from a discoloured stock solution that had been kept for about ten days (B), gave only very weak images under the same conditions of exposure, &c., even with a preliminary treatment of the plate with a saturated solution of carbonate of lithia.

There seems, therefore, no doubt of the beneficial effect of the electrolysing treatment, not only in increasing developing power, but in conferring keeping properties, and thereby greatly adding to the value of amidol as a developer, though it remains to be seen how the treatment can best be applied. I am not sufficiently acquainted with the chemistry of these new amido-phenol compounds to be able to say what the effect of the electrolysing action is, or what new and more permanent compound is produced. It would seem that there is some reducing action brought about with the evolution of hydrogen.

As it seemed desirable to ascertain whether there was any distinct relation between the developing power of these two developers (A) and (B), and the amount of hydrogen given off under electrolysis, they were electrolysed under as nearly as possible similar conditions, with a current from 4 gravity Daniell cells passing through the voltameter, platinum electrodes being used as before. The old electrolysed solution (A), with a current through the voltameter, of 3·25 to 2·8 volts and about 35 milliampères, gave off in 20 minutes 5 c.c. of hydrogen. The old stock solution, diluted with three parts of water, freshly mixed, as (B) was highly coloured and with the same battery, gave off in 20 minutes 4·4 c.c. of hydrogen; the E. M. F. through the voltameter being 3·25 to 3 volts, and the current 36 to 30 m.a., the resistance of the galvanometer being 10 ohms.

In the present stage of these voltametric experiments it would be premature to say that the strength of a developer varies in proportion to the amount of hydrogen given off by electrolysis; but in one case it was very markedly so with Edward's pyro-potash developer and a commercial pyro and ammonia developer. The current from 2-pint bichromate cells being passed through them for 20 minutes; with the former 2·3 c.c. of hydrogen were given off; while with the latter only ·55 c.c. were given off in the same time. The pyro-potash acted as a good developer, while the pyro and ammonia only yielded very faint images under the same conditions. The difficulty in carrying out experiments of this kind is to ensure similar conditions throughout, so that the results may be truly comparable. I hope, however, to bring forward this subject more fully at some future time after further experiment.

As far as I have been able to try amidol it certainly seems to have advantages, when used under the best conditions, of securing density and detail with a minimum of exposure, and will be useful for instantaneous work, interiors, and other poorly illuminated subjects. In using it, it will probably be best to add it dry to a solution of sodium sulphite at 10 per cent., just as required for immediate use, using more sulphite, if necessary, to increase the power of the developer.

Metol appears to be a salt (said to be hydrochlorate) of monomethyl-para-amido-meta-kresol. It is a white powder, quite soluble in water, the solution remaining colourless for an hour or so, but slowly turning yellow and brown. It is not very soluble in alcohol. Alkalies (ammonia and lithia carbonate) darken the watery solution to a deep maroon brown. Acids (sulphuric, nitric, and citric) show no visible change. Bromine water produces a pink tinge. With ferric perchloride the solution was only slightly yellow. Potassium bichromate darkens the solution immediately, and gives a muddy brown precipitate. Potassium permanganate gives a purple colour turning brown. The metol solution reduces nitrate of silver in solution very quickly in the form of a bright metallic powder, some silver being also deposited on the sides of the containing vessel. At first the deposit remains in suspension in the solution. Acetic acid does not prevent this reduction. The solution in both cases had a brownish pink tinge after precipitation of the silver. In some of these reactions peculiar odours were noticed, in some cases like phosphorus, in others, a faint floral smell, and in others, again, a druggy smell, something like jalap. Metol has the advantage over amidol that its solution with sulphite of soda remains perfectly colourless, and shows little tendency to change even in a half filled bottle, though it slowly takes a yellowish tinge. The mixed developer after use takes a pale yellow colour with a strong blue fluorescence.

With lithium carbonate I find it a very good developer, though not quite so powerful as amidol. With soda carbonate rather more density was obtainable, but I have not yet been able to give it a fair trial. Metol seems likely to produce good reversals with the thiocarbamides in dilute solution with a large proportion of alkali, and on the whole promises to be more generally useful than amidol. I hope to be able to report further about it next month.

COLONEL J. WATERHOUSE,
Assistant Surveyor-General of India.

ON SILVER HEMISULPHATE.

(American Journal of Science.)

THE existence of those substances which I described some years ago under the name of photosalts of silver,* necessarily implied the existence of the hemihaloids of silver also, as these latter entered into the composition of the photosalts. Similar inferences, though less definite, had long been drawn from the action of light on silver haloids. Two of these, the chloride and bromide, lost by the action of light their complete solubility in ammonia without becoming completely soluble in nitric acid. Evidently there was indicated an intermediate compound between the normal haloids and metallic silver. During the last ten or twelve years I have devoted much time to the attempt to isolate these lower compounds of silver, and to gain some certain knowledge as to the hemioxide, whose existence seemed almost a necessary inference from that of the hemihaloids. Some eight years ago I obtained a substance having all the properties which one would be disposed to ascribe to Ag_2Cl, and a large number of analyses made seemed to confirm the view. I hesitated, however, to publish a description of it, not feeling entirely certain that it might not be a mixture, as to which a concordance of the proportions found of Ag and Cl with theory gives no sufficient information. Since then M.

* See BRITISH JOURNAL OF PHOTOGRAPHY, pp. 330, 345, 472, 486, Vol. xxxiv.

Guntz has described a subchloride obtained by acting on silver hemifluoride with phosphorus pentachloride and a hemioxide derived from it. Up to the present time no combination of silver hemioxide with an oxyacid has been known.

Such a combination I have been able to obtain as a double salt of hemisulphate and normal sulphate containing one molecule of each. The new salt has a light bright brown colour, and exhibits a stability which, in view of its composition, is something remarkable. It has no tendency either to oxidation or to reduction. Nitric acid, unless very strong, has but little action upon it. Acid of 1·42 poured over it in large excess, and let stand for several days, gradually dissolves it completely, but the same acid diluted with two or three times its volume of water, has so little action that it forms a convenient means of purification. On the other hand, ferrous sulphate, which instantly reduces argentic sulphate, has no action whatever on the new substance, even with several days' contact. Hot, strong sulphuric acid has no action. It might almost be expected that under its influence the argentous salt would gradually take up oxygen and be converted into argentic sulphate. But a specimen which was covered with a large excess of undiluted sulphuric acid in a flask, and was kept under boiling water for ten hours, was not altered thereby. Another strong proof of its stability is found in its resistance to heat.

The application of heat produces a somewhat curious succession of colours. The terra cotta or warm brown shade of the moist substance changes by drying above 100° to pale lilac, at 165°–170° it becomes greyish, at a somewhat higher temperature, yellowish green. Considerably below red heat it acquires a fine ruby red colour. In cooling, this red darkens almost to black, then becomes lighter again, and when cold the colour is light olive-green. The changes are repeated as often as the substance is heated and cooled. No sulphuric acid vapours are disengaged even at a low red heat.

It was mentioned in a previous paper that when silver nitrate is reduced by solutions of phosphorus or hypophosphorous acid, or by acidified solutions of their alkaline salts, transient colourations were produced that seemed to suggest the presence of some form of allotropic silver. Since that paper was published this reaction has been taken up for further study. It soon appeared that when the silver salt was treated with a solution of alkaline hypophosphite, acidified with sulphuric acid, the result obtained was entirely different from that which presented itself under any other circumstances. It became clear that sulphuric acid did not act solely by setting free the hypophosphorous acid, but also acted on the silver with formation of a double sulphate.

A remarkable though limited analogy here presents itself between the substance just described and the photosalts of silver. The silver hemihaloids are very unstable substances, but acquire stability by uniting with the normal haloids. In the same way the hemisulphate, which is not known to be capable of separate existence, becomes perfectly stable by union with the normal sulphate. The limitation to this analogy lies in the fact that the last-mentioned combination occurs in definite proportions, which does not seem to be the case with the halogen compounds.

The new substance, then, is formed by the joint action of sulphuric and hypophosphorous acid on a silver salt. Hypophosphorous acid has but little action on silver sulphate already precipitated, but it is different when the silver sulphate is formed in presence of hypophosphorous acid.

Several silver salts may be used. I have at different times employed the nitrate, phosphate, and carbonate. The latter is perhaps the best, because the action with the nitrate is too rapid, and with the phosphate too slow, and for other reasons.

A weighed quantity of silver nitrate is precipitated with an excess of alkaline carbonate and washed. The carbonate, as well as all other reagents employed, must be absolutely free from chlorides, otherwise the product becomes contaminated with silver chloride which cannot be removed. The silver carbonate is then treated with a solution of alkaline hypophosphite acidified with sulphuric acid. All the alkaline hypophosphite of commerce contains much more than a trace of chloride: this is best got rid of by adding to its solution a little solution of silver nitrate, stirring well at intervals, letting stand for twenty-four hours, and filtering. This filtrate, with addition of sulphuric acid, is to be poured over the moist silver carbonate, and constantly stirred. The reaction is complete in twenty or twenty-five minutes, when a bluish-black film of reduced silver begins to form on the surface. Further action is then cut short by neutralising the liquid with alkaline carbonate. The precipitate is next to be washed several times by decantation. Very pure distilled water is, of course, needed throughout.

Convenient proportions are: forty grammes silver nitrate precipitated with excess of alkaline carbonate. Of sodium hypophosphite, 100 grammes, dissolved in 650 c.c. of water, are treated with a little silver nitrate, and after standing and filtering, four c.c. of sulphuric acid are to be added and the liquid poured over the silver carbonate. After a few minutes, six c.c. more of sulphuric acid, diluted with a little water, are added by degrees. With this second quantity of sulphuric acid the characteristic reddish-brown colour of the substance first appears.

This process may be varied by precipitating with disodic phosphate (which must be perfectly free from chloride) instead of alkaline carbonate. The action is much slower, about twenty-four hours being needed. Silver nitrate itself may be used, but the action is too rapid and the product is less in quantity.

The crude product obtained in either way is to be purified with nitric acid. Acid of 1·42 is diluted with three times its volume of water, and of this dilute acid a quantity is taken about double in volume to that of the precipitate and of the water left after decanting closely. After a time some effervescence takes place, but the mixture does not become warm. After standing for three or four hours over the precipitate, it is to be poured off and the precipitate washed. This treatment with acid is applied three times: the first removes a good deal of silver, the second a little, the third a trace. Each time the acid is left three or four hours in contact. The product is then washed by pouring on it a large quantity of boiling water. This is repeated four or five times, each time (except the first) placing the vessel in a water bath kept at 100° C. for several hours.

The product is either dried in the air or (for analysis) at 100° C. It forms a bright brown substance, permanent in the air, changing to violet when kept for some time at 160° C. It has the peculiarity that when water is poured on it, it makes a sharp hissing noise. This takes place with the air-dried substance as well as that dried at higher temperatures, and as much with the former as with the latter.

The substance after purification has about one-half the weight of the silver nitrate taken.

These proportions and this mode of operating are those that I have found to give the best result. But the substance is formed under a great variety of conditions. It seems impossible to bring a silver salt in contact with alkaline hypophosphite acidified with sulphuric acid without producing more or less of it. Its presence is often completely obscured by reduced silver. But a mass that looks perfectly black and might be supposed to contain nothing but metallic silver will leave, when treated with nitric acid, a bright brown residue of the double sulphate. We have here, as before, an analogy with the photosalts. For it will often happen that a blackish mass, containing metallic silver, and mixed or combined silver chlorides, will, when treated with nitric acid, resolve itself into bright purple or rose-coloured photo-chloride.

M. Carey Lea.

(To be continued.)

HOW TO MAKE DRAWINGS FOR PROCESS BLOCKS.

While the subject of preparing photo-litho and photo-zinco plates for printing from, and of making process blocks of every kind, has for some years received great attention, comparatively little has been written upon the sister art of making drawings suitable for being interpreted by these processes.

And yet this art is one of high importance, and it is becoming more and more practised every day. All the cheap, and some of the more expensive, periodicals have their illustrations made by process work; and even the high-class monthly magazines, which not long since spent enormous sums upon the preparation of their wood engravings, have at length found it expedient to avail themselves of the great resources of photography. Speaking for myself, I have not during the past year made a single drawing that has been engraved by the old and still admirable process on wood, but all of them have been done by reproduction on zinc, both in lines and in washes, the one to imitate ordinary woodcuts, and the other that of fine wash drawings in half-tones.

For a long time the Americans held, in public estimation, the supremacy in delicacy of tone in work of the latter class, as witness, for instance, the magazines of the Harper's class; but since the introduction of process work and the grated screen, with a like quality of paper and good printing, the English magazines can now not only quite hold their own against such powerful competitors, but in some instances, perhaps rare as yet, can even surpass them.

But what I aim at present is to give in this article a few hints and directions how to convert a photograph into a line drawing which, when made into a printing block by process work, will yield prints which cannot be distinguished from an expensive wood engraving.

One must, of course, possess the ability to draw at least to some

extent, and above all things he must have a faculty for tracing with accuracy, else will he be in danger of losing the likeness and expression when drawing a portrait. The hair, drapery, and general surroundings are of comparative unimportance, and a clever artist will convey much of these by a few touches. If one examines the portraits of public men that are prepared for newspaper illustration, he will not fail to notice how much is left to the imagination to supply, while at the same time the characteristic features of the original are readily recognisable. In landscape work this is of less consequence; what is here necessary is to preserve the salient features of a scene without crowding too much into the sketch, and omitting or altering whatever is detrimental to artistic effect, such as badly placed trees or cattle.

There are two ways by which photographs may be converted into line drawings. The first is by special printing, taking care that it is not toned with gold in the usual way, but only fixed. Instead of albumenised paper, it is far better to use plain salted paper, a quantity of which may be prepared at one time, as it will keep good for a long period. This may be done by immersing it in water containing common salt dissolved in it in the proportion of about half an ounce to the pint. Some use chloride of ammonium instead of salt, but there does not appear to be much difference in the result. It should then be hung up to dry, and when quite dry placed in a portfolio for further use. To sensitise this paper, a sheet should be laid upon a piece of flat board or glass, and brushed or sponged over with a forty-five grains to the ounce solution of nitrate of silver in distilled water. There must be no metal about the brush, if such be employed in applying the silver. A few drops poured at the upper end of the sheet, which must in this case be held in a sloping direction, can be spread evenly by means of a glass rod; but, if a dozen sheets are to be sensitised at a time, it is better to pour the silver into a flat, square dish, and float the paper, smoother side down, on it for about two minutes, and then hang it up to dry. This must be done either in a room having deep yellow blinds, or in the evening by candle light. The paper is printed in the ordinary photographic printing frame until it is very dark, and the print is then washed in two changes of water, and fixed in hyposulphite of soda, one ounce to six of water. This will greatly reduce the vigour of the print. It should remain in this eight or ten minutes, and then be well washed in water. When dry it should be flattened by a smoothing iron, and then pasted by the corners to a Bristol board for convenience in handling. It is now ready for being drawn upon.

The ink for drawing is of the highest importance; and, as this applies to every system of process work, it is well to say a few words about it. It must be waterproof, and have such a degree of blackness that the faintest touch of a crow quill or a camel's-hair pencil will tell in the after-operations. That which is preferred by many process artists is the finest quality of Indian ink rubbed up in water to perfect smoothness. The water should be pure and made warm. The dish in which this is done ought to be heated until it feels unpleasant when the back of the hand is pressed against it. I have said that the water should be pure, but it should also be saturated before warming with bichromate of potash, which, as every photographer knows, will render the ink insoluble after drying. If liquid Indian ink, which is sold by artist's colourmen ready in a fluid form, is used, the bichromate should be added to it. When drawing with ink made in the manner directed it is the delicate, fine lines that require attention. They must be firm and black, or of a brownish-black colour—which does not matter. The stronger lines take care of themselves. For myself, I prefer Stephens' ebony stain, which can be got in sixpenny or shilling bottles.

The next thing is the selection of a suitable pen (for I will suppose that the draughtsman in making his first attempts uses a pen instead of a hair pencil). Joseph Gillott makes a variety of artists' pens, suitable for every class of work. If this is to be very fine, his No. 290 will serve the purpose. His crow quill No. 659 is also recommended by a high authority. A bolder pen may be used if the photograph is of large size and has to be eventually reduced to a fourth or sixth of its dimensions, for, as I shall afterwards show, many process blocks are from drawings which, for freedom of handling, are made more than four times the size actually required. But at present I am supposing that the finished block is of the same size as the drawing. I prefer for all-round work Mitchell's F pen, which I find is very easy to work with.

In drawing over the photograph cabinet size, which I will assume to be the head and bust of a gentleman, attention must be paid that nothing is omitted, and the direction of the lines must be studied from a good engraving.

The drawing being finished, the next thing is to discharge the photograph which has served as a base for the tracing. Having unfastened it from the Bristol board to which it was attached by the corners, and ascertained that it is quite dry, place the photograph in the daylight for a few minutes if the light has not had access to it during the drawing. This renders the ink quite insoluble. Next immerse it in a saturated solution of corrosive sublimate (bichloride of mercury), which in a very few minutes will be found to have acted on the photograph with such power as to have caused it to disappear entirely, leaving only your drawing visible. Chemists tells us that the photograph is not really dissolved away, but is only bleached the same colour as the paper. But it has disappeared from view. The drawing is now washed in pure water which is free from any alkali.

Comparison must now be made between the pen-and-ink drawing and another photograph of the subject, which should be taken as a reference. A beginner in this art will possibly discover that he has omitted some important feature, not observed while the photograph still remained upon the paper, but this can only arise from carelessness, and will probably not occur a second time. He may, perhaps, also discover that, from a like cause, he has altered the likeness or expression; but much of this latter is capable of being remedied by the application of Chinese white to stop out offending lines, and re-touching them with black ink.

A second way by which photographs may be converted into line drawings is by superposing on the photograph a sheet of thin woven paper, which has been rendered temporarily transparent by brushing it over with benzole in which Canada balsam is dissolved, and making a tracing precisely in the way previously described. This tracing paper should be attached to the photograph by the upper end. It has this advantage over the other, that it enables you to judge of your progress by inserting a sheet of white paper between the photograph and the tracing, so that an examination can be made at as frequent intervals as you desire. When the tracing has been accomplished, the paper is restored to its original white state by a fresh application of pure benzole, which dissolves out the Canada balsam. Castor oil, wax, and a number of other substances may be applied to paper to render it temporarily transparent, methylated alcohol, or any other solvent of the substance employed, serving to restore the purity of the paper.

A. J. Gough.

WORK WITH A HAND CAMERA.

Before the last meeting of the Putney Photographic Society Mr. Henry Crouch deputised for Mr. Dresser on this subject from notes supplied by the latter gentleman, and supplemented by his own experiences.

Mr. Crouch said that there could be little doubt but that the "ordinary" cameras were being gradually superseded by the hand camera, and that sooner or later the former would be a thing of the past. There were several reasons why this should be so, but the two chief were the improvements in the hand cameras and that plates were now made of such greatly increased sensitiveness that sufficient exposure could be obtained for snap-shots even in what would quite recently have been considered too dull a light. With regard to the cameras, every year showed a marked alteration for the better. Attention had been successfully given to the lens, shutter, and changing mechanism, and extra movements had been added, such as focussing, rising front, and swing-back. Hand cameras might be divided, broadly, into two classes, viz., magazine and those where the ordinary dark slides were used. Each system possessed advantages peculiar to itself, and it was a matter of individual opinion or special requirements which determined the question which camera was the most suitable. No camera should be expected to meet all wants. Some people desired to do very quick work; to them a magazine camera would offer advantages. Others wished to get the best results under varying conditions; for such the double backs or roll-holder would be preferable. For all-round work he had personally no preference, but thought that good and artistic work could be done with any good magazine or double-back camera, if workers would only take the trouble to make themselves acquainted with the mechanism and the extent and limitations of the power of their camera. Mr. Dresser had successfully worked the rollable film, and this method had the great advantage of compactness, lightness, and ease of changing; but it would appear, from general practice of average workers, that these advantages were not unfrequently considered to be more than counterbalanced by the subsequent trouble and uncertainty in development, &c.

Mr. Crouch then proceeded to deal in detail with the main parts of the hand camera, commencing with the lens. He said that, in hand cameras, the mistake was often made of using an inferior lens; in fact, one that no serious photographer would dream of placing on his ordinary camera. This was all the more inexplicable, when it must be obvious that the conditions of successful work with a hand camera were far more difficult, and required higher optical qualities in the lens than were generally found necessary in ordinary work. In order to obtain a suitable extent of view, and to be able to take in objects fairly near as well as at a distance, it was necessary that the lens should be of a comparatively short focus. For a quarter-plate, Mr. Dresser used, by preference, one of four and a quarter inches focus. Mr. Crouch personally preferred one of about five inches, but it might be laid down as a rule that the focus should be

between four and a quarter inches and five and three quarter inches, and certainly not more than six inches; if more than six inches, the chief objects within twenty-five feet or thirty feet would be out of proportion to the plate, and successful photography of street scenes and subjects in any but very open views would be extremely difficult. As regarded aperture, he had made lenses working at *f*-5, but they were not to be recommended, except to the most expert workers, who would only use them at this aperture with the greatest discrimination; *f*-8 was, generally speaking, the largest aperture at which any lens would work satisfactorily, as regards covering power and depth of focus, and, as a rule, a smaller stop should be used if possible, so that, when the principal object is in focus, the foreground, as well as the distance, may be fairly sharp. As a large aperture required very much more judgment and experience in working than did a moderate one, of, say, *f*-11 or *f*-16, he recommended beginners to commence with the smaller, and only by slow degrees, and after careful study of results, to increase it. A rapid rectilinear lens was by no means necessary, and Mr. Crouch said that, for landscape, and, indeed, for nearly all subjects except architecture, a good single lens was preferable, as it undoubtedly gave pictures of greater brilliancy. This result was, he thought, to a great extent due to the fact that the diaphragm was placed in front of the lens, and therefore a larger quantity of light could enter than was possible when the diaphragm was placed between the combinations, as in lenses of the rapid rectilinear type. The single lens had also the advantage of being considerably cheaper, a really good one being about the same price as a rapid rectilinear of comparatively inferior quality. As a first-class lens was the first consideration in hand-camera work, he strongly urged every one who desired to do good work to see that his camera was fitted with as good a lens as he could afford to provide. As regarded shutters, there was an almost endless variety in the market. He thought a good one should work with certainty at from one-two-hundredth to two seconds, and the best place for it was near the diaphragm, or immediately in front of the plate, the latter being, theoretically, more correct; but, after careful comparison of results, he had come to the conclusion that there was practically little or no difference, but as the shutter working near the diaphragm could be more compactly arranged, and had several other advantages, he preferred it, on the whole, to other forms. It was necessary that all parts of the shutter should be very strongly made, so as to be able to resist the very considerable strains due to a high speed, and it should be as simple as possible, so as to be unaffected by small particles of dust and other vicissitudes, which he had known to seriously interfere with delicate mechanisms at the critical moment. For occasional work, Mr. Crouch advised a fixed-focus camera, but for those with leisure, and in constant practice, better work would be possible with the power of altering the focus; this would, however, probably mean many failures, until they were able to judge distances quickly and correctly. He had found finders a great nuisance, and quite unnecessary, and he strongly advised members to do without them; by practising pointing the camera, he ventured to assert that, in a very short time, they would acquire the necessary proficiency to get the subject properly on the plate, and the finder would not be missed. As to the proper way of holding the camera, he did not think that any one position would meet all requirements; for near objects, he held it in front of him, about four feet from the ground—sometimes considerably lower; for far objects, he held it higher. In this connexion he had found a rising front of great assistance, as a very slight rise or fall of the front was equivalent to altering the height of the camera several inches. Using the camera in this manner, without finders, he claimed to be able to get in exactly what he wanted with greater speed and ease, and with less trouble in keeping lines parallel and true. There were now so many good plates and films that it would be invidious to advise the use of any one, but it should be remembered that, for hand-camera work, a brand having an emulsion rich in silver was much more necessary than when slow exposures were given. His advice was, Having found a good brand of plates or films, and suitable developer, stick to them.

He regarded development as one of the chief means towards a good result. When a plate had had an exposure of only one-two-hundredth of a second, much experience and careful thought were necessary. The following formula had, in his hands given excellent results, viz.:—

Eikonogen	1 ounce,
Sulphite of soda	4 ounces,
Carbonate of potassium	1 ounce,
Carbonate of soda, or washing soda	1½ ounces,
Water	30 ,,

and any hydroquinone developer, one without *caustic* soda by preference. With very fast exposures, two parts eikonogen solution should be added to one part of the quinone, to begin with; if this does not act sufficiently quickly, pour it off and use the eikonogen alone, adding saturated solution of carbonate of potassium per ounce till the plate began to fog. Some plates would stand up to one drachm per ounce, and others would not stand any addition.

It would thus be seen that a strong developer should not be used to start with. Begin with a normal developer until the image is fairly out, and then strengthen until the plate will bear no more.

Perhaps a still better developer for general work, and lantern slides, bromide papers, and exposures from one-tenth to one-hundredth of a second is,

Rodinal	1 part.
Water	20 parts.

Should there be any difficulty in getting density, the developer should be poured off and hydroquinone used.

He, however, thought that the best developer for snap-shots would be found in amidol, but was unable to say so definitely, having had only two chances to try it. However, on those occasions he had obtained marvellous detail and density, using the following formula:—

No. 1.

Amidol	1 ounce.
Metabisulphite of potassium	1 ,,
Water	10 ounces.

No. 2, saturated solution of potassium; No. 3, ten per cent. solution of potassium bromide.

For use take, No. 1, 1 drachm; No. 2, 1 drachm; No. 3, 5 drops; water 1 ounce.

Should exposure have been very rapid, leave out No. 3; if necessary to increase density, add twenty to forty drops more of No. 2. The image would flash up at once, but the plate would not fog unless very much over-exposed. In cases of over-exposure, more bromide should be used, but developer should not be weakened by the addition of more water.

PHOTOGRAPHY IN SCOTLAND.

[Abstract of the President's Address to the Glasgow Photographic Association.]

I often think that, were Daguerre or Talbot to come back amongst us and to appear before the Glasgow Photographic Association, it would take us all our time to give them a respectable audience—respectable, that is, so far as numbers are concerned. Now, this is not as it should be. Surely a little enthusiasm should be forthcoming from the votaries of an art which has already accomplished so much in the past, and which bids fair to accomplish still more, and that in the near future. I know of no art which is better calculated to awaken enthusiasm than that of photography, and surely the members of the Glasgow Photographic Association will not be that exception which goes to prove the rule by a total apathy and indifference. The indifference of Glasgow—and here I refer to the amateur photographic element no less than to the professional—was very well shown in the poor representation which Glasgow made at the Edinburgh Convention held in July. Including myself, there were only five members of the two Glasgow Associations present. These five "good men and true" are all members of this Association, and only one has the distinguished honour of being a member of our contemporary; so that, practically, it amounts to this, that the Glasgow amateur photographer was conspicuous by his absence. Photography surely is a thing vastly superior to clique work and to an annual division of medals. The true enthusiasts of the art will be found interesting themselves more with the conquests gained and the immense strides year by year our art is making, than with the acquisition of metal trophies or parchment awards.

Speaking of the Convention reminds me that the next meeting is to be held in Plymouth, and the Glasgow Photographic Association has the honour of providing the Convention with its future President. Mr. George Mason, the President-elect, one of our members of Council, will worthily fill the post. Applying the rule of three, if five Glasgow men go to Edinburgh, forty miles off, how many will be found next summer going south, say, 800 miles. This conundrum may be made to replace the "missing word" competition now declared illegal. Our best congratulations are tendered, I am sure, by one and all to Mr. Mason in his capacity of President of the Photographic Convention of the United Kingdom. There have been now six Presidents in all, three of whom are Scotchmen—Taylor, Pringle, and last, though not by any means least, Mason.

No startling photographic discoveries have been brought forward during our summer recess. The introduction of the developer amidol is, perhaps, the feature of greatest interest. I do not know its true chemical composition; it is presumed to be what is known as amido-phenol. Here is the substance in question: It is closely allied to the developer rodinal, both being derivatives of phenol, better known as carbolic acid, the true chemical name of rodinal being para-amido-phenol. It is almost too soon to speak of its adaptability for negative work, but, for transparency pictures, it throws a very pleasing black deposit very similar to rodinal. I have made use of it myself in this direction, and will show, by means of the lantern, one or two slides produced by its means. It is invariably employed along with sodium sulphite. Since writing foregoing I find, at page 742 of The British Journal Photographic Almanac, the details of patent specification are given by J. Hauff, Feuerbach.

In connexion with what will come before us this season, I should have mentioned that I have a promise from Mr. F. E. Ives, of Philadelphia, that I shall have at an early date an opportunity of showing to members what has been accomplished in the way of colour reproduction by Ives' method.

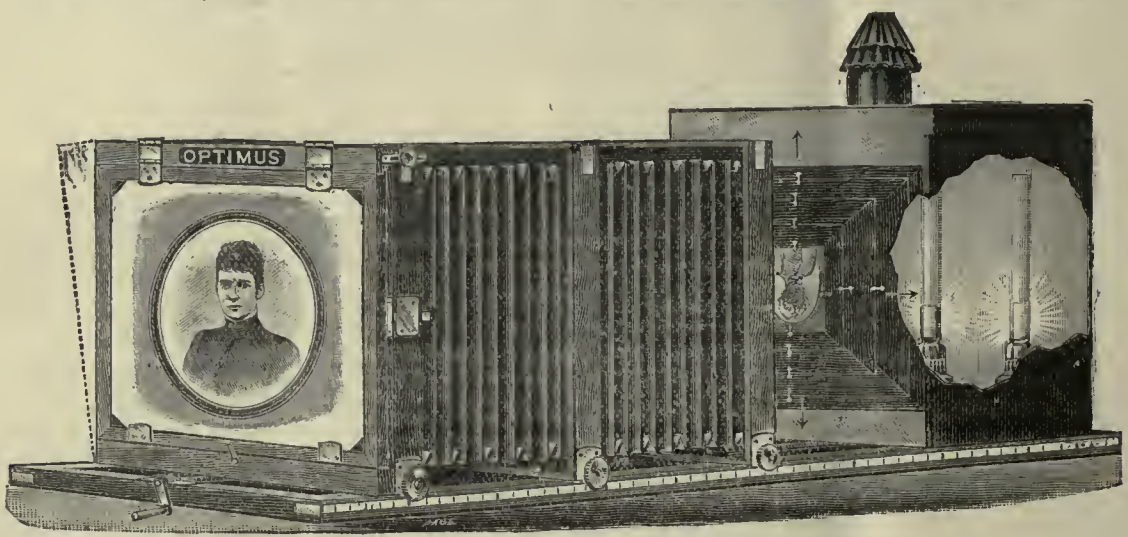
Another interesting night might be had with an arrangement of showing photographic transparencies in relief on the screen, a method having been discovered by Mr. J. Anderton, of Birmingham.

An advance in printing paper is the employment of what are known as printing-out papers, where gelatine replaces the now more or less discarded albumen. Gelatino-chloride paper, as it was formerly known, will certainly run albumen chloride very hard. The ease with which a highly enamelled surface can be obtained is one of its distinct advantages. Perhaps some of our professional friends will give a demonstration during the session and state their experiences. WM. LANG, JUN., F.C.S.

A CONVENIENT ENLARGING APPARATUS.

With a view to the photographer becoming his own enlarger, Messrs. Perken, Son, & Rayment have introduced an enlarging apparatus which fulfils the requirement in a singularly perfect manner. Its configuration is shown in the engraving.

It is adapted for enlarging either by daylight or artificial light. For the latter, there is an illuminating chamber at the rear, containing two



oil lamps, by which the opal, or ground glass plate behind the negative is uniformly and well lighted. For the former, this chamber is removed, and the end of the apparatus directed against the sky; hence this instrument may be used either by day or by night. The adjustments provide for any portion of the negative, from the corner to the centre, being brought opposite to the lens. The several moving parts have each a rack and pinion, so that they can be relatively adjusted one to the other. The baseboard is likewise furnished with a screw, which goes from end to end. When all the adjustments have been made, each movable part can be securely clamped. We think very highly of this apparatus, as it so well fulfils the requirement of enabling a professional photographer to make an enlargement himself when time does not admit of his sending it to the professional enlarger. The reader will already have deduced from the above that reductions from large negatives can be as easily effected as enlargements from small ones.

THAUMATROPIC EVOLUTION.

UNDER the title of An Electrical Wonder, there is now open in 425, Strand an exhibition of several of the renowned photographs of Herr Anschutz of animals in motion. They are seen in apparent actual motion, each subject being composed of a series photographed in rapid succession, and then shown while in rapid rotation by the well-known instrument known as the thaumatrope, the phenakistiscope, the wheel of life, or the zoopraxiscope. The present one, however, has been specially constructed to be illuminated by electricity. As these instruments have all been, at some period, described in these pages, nothing need here be said concerning the principle involved in their construction and the application of the persistence of vision. The attitudes assumed by men in jumping or horses in movement are most admirably displayed, and, judging from the great interest that was displayed over a year ago in the witnessing of similar animals in motion, shown by Mr. E. Muybridge before some of the learned societies, we can recommend a visit to those of Anschutz, in the certainty of the spectator being both amused and interested. Mr. A. Schwarz is the agent in this country for Anschutz's clever productions.

RETOUCHING WITH THE INCANDESCENT LIGHT.

[Photographic Times.]

THE dark weather and Christmas busy times are on us, and poor-light nights and mornings, together with occasional days of leaden sky, force the retoucher to concentrate effort, and make hay while the sun shines.

The terrible havoc which overworked or abused eyes play with the general health of men and women, is well known to physicians and oculists; and this abuse and overwork at this time of the year is not only frequent, but the rule. To a humanitarian, the wicked waste of human life spent at the retouching desk is appalling and utterly inexcusable.

Fortunately the progress of invention has made ready to our hands an apparatus which mitigates this extra waste, and, perhaps, would prevent it altogether if universally used. I refer to the incandescent electric light. No retouching stand, at this time of the year, should be without it; the cost is insignificant for both apparatus and current, while the steady light which it gives is a great relief to the wearied eyes struggling in vain to see with the aid of a mirror as reflector.

In my own practice I use a twenty-five candle-power lamp, and have a lot of slack wire so that I can place the light where I please: ordinarily it rests at one side of my retouching desk, ready to be moved at a moment's notice to its place, directly in front of the hole where I work, and about six inches away from it. A ground glass stands close in front, and another half-way between it and the negative, and the regular ground glass of the stand makes three thicknesses of that commodity. Although there is a little glare, I don't find it annoying. The whole is adjusted in a minute, and there is no loss of time. This glare can be avoided by using a thirty-two candle-power lamp, and placing it a little to one side, so that it is not directly in front; diffusing with a piece of ground glass close to the globe, and surrounding on all sides by white reflectors, gives an easy and agreeable light.

By interposing a plate flowed with collodion containing a little aniline violet, a good deal of the yellowness is avoided, and a soft easy, slightly greenish-coloured light results, which is pleasanter to many than the yellow of all small artificial lights.

The superiority of the incandescent light lies in its comparative freedom from heat and consequent danger of fire; its ease of application, for the lamp takes up so little room that it need not be moved from the stand; but most of all it is steady and constant, there being absolutely no flicker to weary the eyes, such as makes gaslight unbearable and kerosene lamps wearying. I have several times during the past two years worked all day with the light as described, and found myself little if any more tired than with daylight, and the work is of a more uniform character than is the case where negatives are retouched in a poor afternoon light, every negative retouched by the incandescent being fully up to the standard. R. W. HARRISON.

WE had the pleasure of a call the other day from Mr. Peter Mawdsley who is on a brief visit to this country from his adopted home at Rochester N.Y. Mr. Mawdsley had a great deal of interesting information to impart in regard to photography "on the other side."

Our Editorial Table.

Messrs. Cadett & Neall have sent us a sample of their "Lightning Plates," 130° (Hurter & Driffield). They are exceedingly rapid, and, allied with high sensitiveness, possess the good qualities of a first-class plate.

The Anschutz Tachyscope.

At the present moment, when the Anschutz Electric Tachyscope, the wonders of which are developable by dropping the omnipotent penny into the inevitable slot, seems likely to find public favour, it may not be unsafe to assume that the Tachyscope itself (which is in the hands of the Blackfriars Company, of Surrey-row) will achieve renewed success. It consists, as most of our readers know, of a series of reductions of instantaneous photographs of men and animals in various consecutive attitudes, so to speak, which are printed on strips of paper. These, when placed in a revolving circular receptacle, and viewed through small slits, convey a perfect impression of motion. Much amusement, and no little instruction, can be obtained from the Tachyscope, which should be highly appreciated at this time of the year.

"Photographs at the Pall Mall Exhibition."

The Photographic Publishing Company, 215, Shaftesbury-avenue, W.C.

Although somewhat late in appearance, we are glad to welcome this publication. It consists of several plate and other reproductions of pictures shown at the Photographic Society's Exhibition which the Editor, Mr. Charles W. Hastings—who also writes an appreciative notice of the photographs—has selected for illustration. The tones of some of the "Woodburygravures" are perhaps not the most suitable that could have been selected for the subjects, but with this exception the collection is very good. Mr. W. Bedford's *Norwich Anglers*, Mr. Benham's *Lions*, Mr. Burchett's *Love Letter*, Mr. Byrne's *A Grecian Girl*, Mr. Dresser's *Aylesford*, Colonel Gale's *East Country Quay*, Mr. Lord's *How's That*, Mr. Stevens' *Coleus and Begonias*, and Mr. Tagliaferro's *Uninvited Guest* are among the pictures reproduced in plate form, while there are several half-tone illustrations in the text of equal merit. The work is a most artistic *souvenir* of a memorable Exhibition.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 23,010.—"Improvements in Clamps or Rests for Photographic Cameras and other Instruments similarly supported." T. B. Ralston.—*Dated December 14, 1892.*

No. 23,104.—"Portable Chamber and Apparatus in connexion therewith for Photographic purposes." Y. D. d'Aten, *né* de Luynes.—*Dated December 15, 1892.*

No. 23,229.—"Improvements in Plate or Film-holding Changing Backs or Slides for Photographic Cameras." T. Samuels.—*Dated December 16, 1892.*

No. 23,251.—"An Improvement in Photographic Emulsions." F. W. Stoddart.—*Dated December 16, 1892.*

No. 23,259.—"The Gordon Portable Optical Lantern." J. Trotter.—*Dated December 17, 1892.*

No. 23,273.—"Improvements in Shutters for Photographic Cameras." G. D. Hughes.—*Dated December 17, 1892.*

SPECIFICATION PUBLISHED.

1892.

No. 1199.—"Photographic Cameras." Hawkins.

PATENTS COMPLETED.

Improvements in or relating to Roll-holders for Photographic Films.

(A Communication by Frank A. Rownell, Rochester, County of Monroe, State of New York, United States of America.)

No. 625. Alfred Julius Boult, M.I.M.E., 323, High Holborn, Middlesex. *November 12, 1892.*

The present invention relates to the film-carrying and feeding devices of roll-holders for photographic film, and has for its object to improve particularly the construction and operation of the measuring and arresting devices for arresting the operation of the feeding devices after a certain quantity constituting preferably a single exposure has been wound forward or into a position to be exposed in the camera.

The casing may be adapted to be applied to the back of a photographic camera of any desired construction, and may be divided into two longitudinal compartments by means of a partition, to which is secured a film support or table having at one edge an antifriction roller, while the other edge is rounded so that the film may be moved from one compartment over the table or support and back to the other without undue friction, and may be held, while the exposure is being made, perfectly flat upon the support.

The flexible photographic film may be wound upon spools supported in bearings in boxes or receptacles adapted to be inserted into the compartments in the holder casing, and the outer end of the casing is closed by a cover plate secured in position by means of a screw adapted to be operated from the exterior of the casing, and engaging a nut secured to the partition piece, or other suitable fastening devices could be employed. The boxes containing the film spools are provided at one corner with a slit or opening for the passage of the film into and out of the boxes. The ends of the spools are provided with slots or the entrance of ribs or projections on the winding and measuring devices, as will be hereafter explained.

The film-winding or feeding devices consist, in the present instance, of an arbour journalled in the casing end, and having on its inner end a rib or projection arranged to enter the corresponding groove in the end of the spool, and provided on its outer end with an operating handle, and secured in place by a plate, and also provided with the usual ratchet mechanism for preventing the reverse movement of arbour. Arranged at the corresponding end of the other longitudinal compartment in the casing is an arbour journalled in a plate and provided on its inner end with a rib or flange arranged to enter the slot in the end of the spool located in the compartment. It will be understood that the receptacle containing the spool of unexposed film is inserted in one compartment, and the end of the spool engaged with its appropriate arbour, and the film extended over the support and attached by any suitable means to the roller in the receptacle in the other compartment, which roller is engaged with the key or handle, so that the revolution of the arbour can be seen from the exterior of the holder.

In practice I make the breadth of the support approximately equal to the circumference of the spool when containing half its normal quantity of film, so that each revolution of the supply spool will indicate that approximately the quantity of film necessary for a single exposure has been moved forward over the support; therefore, if the supply spool is arrested and the film is marked at the edge of the support at each revolution of the supply spool, the operator will not be in any danger of winding forward more than the amount of film necessary for a single exposure, and he will be enabled, by means of the designating mark, to readily sever the film into the separate exposures. Upon the outer side of the plate is arranged a locking detent or lever secured to an arbour journalled in the plate, and extending around a collar secured to the arbour, the latter having on its outer end a milled head. The collar is provided with a recess, and the locking detent with a projection adapted to enter the said recess and arrest the rotation of the arbour and spool. At the forward or free end of the detent is a screw or pin extending through a slot in the plate, and operated upon by a spring, which, in turn, is coiled around a screw, its outer end passing through a lug secured to the under side of the plate. The tendency of this spring is to move the detent in a direction to cause the engagement of the projection with the recess, and if this projection rested normally on the periphery of the collar the engagement would be effected and the supply spool arrested at each revolution; but, when the operator desired to release the locking mechanism in order to wind forward another exposure of film, the projection would immediately drop back into the recess and prevent the winding operation unless some means were provided for holding it out of engagement after being disengaged from the collar. In order to provide for this, and to hold the detent out of engagement until just before another revolution of the spool is made, I provide a retaining dog pivoted to the under side of the plate and provided with a slight notch, adapted to engage the pin on the end of the detent. A spring is passed around a screw, one end engaging a flange on a pawl and pressing the latter toward the arbour in a direction to cause the engagement of the notch with the pin. Arranged upon the arbour is another pin, adapted, when the arbour is rotated, to engage the retaining dog and move it in a direction to disengage the former pin and permit the projection on the lever to rest upon the collar. Journalled loosely upon the arbour is a ratchet counter disc having upon its face next the plate a series of figures indicating the number of exposures and visible one at a time through an aperture in the plate. This disc is prevented from backward rotation by the end of the spring which engages with it, constituting a pawl, and upon the pin attached to the detent is pivoted a pawl which is held in engagement with the wheel by a spring which engages with its heel beyond its pivot, and also moves the detent into engagement with the collar, so that, when the lever is moved by its operating handle in a direction to disengage the projection from the collar, the counter disc or ratchet wheel will be moved, one tooth showing another number through the aperture, and when the projection on the lever drops into the notch the pawl will move over the ratchet and engage the next succeeding tooth.

In order that the film may be properly marked after each exposure, so that it may be severed into separate negatives, I locate at one end of the film-support a small pivoted lever, having on its inner end a pin or projection adapted to perforate the film from the back when the lever is moved on its pivot, and extend the outer end of said lever through a perforation in the end of a link pivoted to the end of a lever rigidly secured to an arbour, the connexion being such that, when the locking detent is thrown into engagement by its spring, to arrest the spool and the arbour rotated, the lever is turned on its pivot and the pin passed through the film, marking the latter at the edge.

It will be understood that the lever may be pivoted at its middle, causing the marking to take place when the spool is arrested, or the location of the pivot could be so changed that by the release of the detent the marker could be caused to operate.

The operation of the device will now be readily understood. A receptacle containing a full spool of film, preferably having pieces of black paper secured to the ends of the film, one of which is attached to the spool, and the other extending out through a slot in the receptacle, is placed in its chamber, and the slot in the end of the spool is engaged with the rib on the arbour, and another receptacle having an empty spool therein is placed in the other chamber in the holder, the slot in its spool engaging with the rib of the wind-

ing arbour. A piece of paper being secured to this spool or roller is extended through a slot in the receptacle, led over the film support, and connected with the piece on the supply spool, then the cover plate is secured in position, and the winding arbour is turned until an exposure of film is drawn over the film support, the movement necessary for this being determined by the length of the paper on the outer end of the film on the supply spool. The film is now exposed in the camera in the usual manner, and it is assumed that the film spool was arrested when the first exposure was wound forward by the movement of the locking detent. At the same time the notch of the retaining dog engages the pin and holds the detent so that it will not immediately drop back into engagement with the notch in the collar. Then the winding arbour is turned, and a new exposure of film wound forward, and just before the rotation of the supply spool is completed the pin on the arbour engages the retaining dog and moves it into position, allowing the projection to rest on the periphery of the collar, so that on the continued movement of the film and the rotation of the supply spool the projection will drop into its notch and arrest the movement of the spool, after which the film can be stretched or strained slightly so as to cause it to lie flat on the support, the backward movement being prevented by the pawl.

When the detent is moved to release the spool, the pawl engaging the counter disc turns the latter one tooth, and displays the next succeeding number through the aperture in the plate, indicating the number of exposures, and enabling the operator to readily determine how many are left, the numbers on the counter disc corresponding to the number of exposures contained in a full spool.

When the arbour is engaged by the detent, the film-marking device will be operated from the latter in the manner previously described.

While it is not necessary, I prefer to employ the milled head on the supply spool, so that, if necessary, the operator may move the spool slightly to put the film under tension by rotating the spool backward in the event of its becoming loose from any cause. While it is desirable to provide a disc having a notch engaged by the detent, this is not essential, as a single tooth or projection would perform the function of the side of the notch from which the arbour moves, that could be engaged at the proper time by the projection or its equivalent.

This locking and counting device is cheap, readily applied, and has been found in practice admirably adapted for the purpose, and the measuring of the film into exposures by the rotation of the supply spool is found to answer all practical purposes, though, of course, where large rolls of film are employed, it is preferable to use a measuring roller, operated by the film. It will be understood that this invention could be as well applied to the measuring roll of roll-holders of the ordinary or any preferred construction.

The details may be varied without departing from the spirit of the invention.

Improvements in Magic Lantern Slides and in Substitutes for Stained Glass.

No. 3486. Henry Erskine and Charles Taylor, 63, North Frederick-street Glasgow, Lanarkshire.—*November* 12, 1892.

Our invention relates to improvements in magic lantern slides, and consists in making the slide of mica. The mica is first treated with a solution of collodion and ether, or purified isinglass, or fish glue, or silicate of soda, or transparent varnish, or size, or any of these solutions, or any combination of the same, or any transparent solution giving a transparent surface on the mica, and the drawings, designs, pictures, or words, are printed thereon in black ink, or black ink and transparent colours, or any colours, by hand or machine, letter-press printing, lithography, photography, photo-lithography, collotype, zincotype, photogravure, or any other cognate manner of producing printing or transferring any drawing, picture, or design, to be used as a magic lantern slide.

We might also substitute mica for stained-glass purposes, in which case it is treated, and the designs are painted or printed in a manner similar to the slides.

It is to be understood that the mica may be used without being first treated with any of the solutions already described.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is :—1. Making magic lantern slides of mica in the manner substantially as described. 2. Treating mica so that it can be used as a substitute for stained glass, substantially as described.

Improvements in and connected with Photographic Cameras.

No. 941. Alexander Jeffrey and George Wishart, 140, West Nile-street, Glasgow, Lanarkshire.—*November* 19, 1892.

This invention comprises various improvements in photographic cameras and their accessories, which by means of them are rendered more convenient and satisfactory in use, whilst other advantages are also secured.

An improved camera, as made with some of the improvements, comprises a main frame fitted to receive the photographic plate or dark slide containing it, and having attached to it a pyramidal bellows, the smaller end of which has fixed to it a small board or lens frame, having the lens holder secured to it. The lens frame is jointed at the middles of its ends to small metal bars, each of which has one end jointed to what is termed the baseboard, and this baseboard is hinged to the main frame. The other ends of the small bars have fixed in them pins fitted to slide in slots in side bars, jointed to the main frame at the corners of the side opposite to that at which the baseboard is hinged. With this construction the lens frame can be moved inwards with the bellows close up to the main frame, or it can be drawn out to a suitable focussing distance, and in the latter position is held firm by the pins in the small bars engaging in notches in the side bars. The baseboard may be made of wood, in which case it is made of a U-shape instead of with a central hole ; or instead of such a board there may be substituted a pair of slotted side bars like those on the other side. Adjustable stops are provided to determine the precise angle to which the baseboard is to be opened, these consisting of round-headed screws in the frame and adjustable flat-headed screws in the baseboard. The small bars immediately carrying the lens frame are jointed to plates which are adjustable on the baseboard or side bars for the purpose of regulating the focal distance ; and instead of permanently fixed pins on the ends of the small bars there may be button-headed screws by means of which the small bars can be clamped in desired positions on the side bars. The attachment of the side bars to the main frame may also be made adjustable.

The main frame is made with the usual groove to receive the dark slide ; and when the dark slide is made for two plates, light is prevented from entering between the two parts by a rib of rubber or other suitable flexible material fixed in a groove in one part, and entering a groove in the other part, when the two parts are closed together.

Instead of the ordinary dark slide, we in some cases use a dark slide made of paper or other suitable thin material, and made just large enough to hold a single plate. This slide is made with a back and a front part, the bottom and side edges of the back part being doubled over and cemented at the corners to form grooves to receive the plate and the front part, which last is made with an extension or flap at its outer end, by means of which it is taken hold of to be drawn out for exposure when in the camera. A stop is provided to prevent the movable part being drawn out too far. A camera may be made with slide-grooves suitable for the new dark slide, in which case the camera can be made smaller for a given size of plate ; or an adapter frame may be provided to fit in the grooves of a camera of ordinary size, this adapter frame being made with grooves for receiving the new dark slide.

The new dark slide is made black, or otherwise impervious to actinic light. The cost of such slides will be very small, and sensitive plates may be put up in them at once by those who prepare such plates, and who can have their advertisements printed on the outsides of the slides.

Improvements in and relating to Photographic Apparatus.

No. 21,716. Emile Franck-Valery and Paul Frank-Valery, 42, Boulevard Bonne Nouvelle, Paris, France.—*November* 19, 1892.

This invention relates to a photographic apparatus having exteriorly the form of a leather case such as is carried by tourists on the shoulder-belt for containing their binocular or opera glass.

The improved apparatus comprises a box which serves as a base for the same and contains the object-glass, shutter, and focussing device. Upon this box are hinged the two sides of a leather case interiorly provided with a sheet of copper which is adapted to their shape, and serves to strengthen them. When the sides are put together they are held in the first place by a clasp similar to the ordinary clasps for albums, and in the second place by a leather cover, which does not differ from those used for binocular or opera-glass cases.

To further strengthen the aforesaid two sides and prevent the bending of the same, they are each provided interiorly with a mounting ; these two mountings having articulated to them two pairs of compasses which serve to keep the sides apart when they are opened.

The mountings have a hinge at their upper part, and carry two flexible bands of hardened steel, united by a third band of the same thickness, and placed at the same height as they.

These two bands have their other extremities united by a cross piece provided with velvet, but the latter is separated from the bands by small wedges, which keep it at the necessary distance from them for the passages of the frame.

The said two bands serve also for carrying pieces of fabric which form the camera obscura and are fixed at their other edges upon the said box and the two movable sides. The apparatus is carried by a shoulder belt traversing guides and attached to buckles.

One of the said buckles is attached to the cover for the focussing device, so that for using the latter it is sufficient to move away the belt with the hand in order to open the cover and look through the said device.

The shutter is simply of a sheet of metal pierced with a hole and fixed to a spring rod connected by a cord to a small exterior knob. For putting the shutter ready for action this knob, and by it the shutter plate, is pulled until a spring bolt enters a notch formed in the above-mentioned spring rod. For disengaging the shutter a pressure is exerted upon a knob provided for the purpose.

As this apparatus is also provided at its cover with a handle, it may also be carried in the hand.

When the case of this photographic apparatus is closed, the aforesaid bands are bent in the interior of the said case, and the compasses are closed. In this position nothing shows on the outside that the device is anything but a binocular or opera-glass case, the shoulder belt covering even the joint formed by the sides when they are placed together.

For using the apparatus, it is sufficient to remove first its cover, and then the clasp. Under the action of the bands forming springs the two sides are caused to move asunder, and when the compasses have been adjusted by passing with the hand into the interior of the chamber, the apparatus is quite open, the bands being under tension and ready to receive the frame.

This frame which may be of any suitable construction with a screen or otherwise, must have on three of its edges a groove so as to fit exactly upon the three bands. The said frame, with the screen below, is slid upon the two bands, and bears with its rear extremity against the third band, upon which it will fit.

As the cross piece is covered with velvet or the like, the screen can be operated without fear of light passing into the interior of the chamber.

Although the improved case employed is adapted for a photographic apparatus, it may serve for the reception of a binocular or opera glass. For this purpose two cushions are arranged at the top of the box hereinbefore mentioned. The binocular or opera glass is preferably covered with a leather bag so that it shall not be injured by the metallic parts of the case, and that the tourist shall be able to carry it easily with him without the photographic apparatus.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
December 27 ...	Birmingham Photo. Society ...	Club Room, Colonnade Hotel.
,, 27 ...	Great Britain (Technical)	50, Great Russell-st., Bloomsbury.
,, 27 ...	Hackney	205, Mare-street, Hackney.
,, 27 ...	Halifax Camera Club.....	
,, 27 ...	Lancaster	Springfield Barracks, Lancaster.
,, 27 ...	Leith	105, Constitution-street, Leith.
,, 27 ...	Newcastle-on-Tyne & N. Counties	Central Exchange Art Gallery.
,, 27 ...	Paisley	9, Gauze-street, Paisley.
,, 27 ...	Warrington	Museum, Bold-street, Warrington.
,, 28 ...	Bath.....	Roy.-Lit. & Sc. Inst., Terrace-walks.
,, 28 ...	Burnley	Bank Chambers, Hargreaves-street.
,, 28 ...	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 28 ...	Southport	The Studio, 15, Cambridge-arcade.
,, 28 ...	Stockport	Mechanics' Institute, Stockport.
,, 29 ...	Camera Club	Charing Cross-road, W.C.
,, 29 ...	Glossop Dale.....	
,, 29 ...	Halifax Photo. Club	Mechanics' Hall, Halifax.
,, 29 ...	Hull.....	71, Prospect-street, Hull.
,, 29 ...	Liverpool Amateur.....	Percy-buildings, Eberle-street.
,, 29 ...	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 29 ..	Oldham	The Lyceum, Union-street, Oldham.
,, 30 ...	Cardiff.....	
,, 30 ...	Croydon Microscopical	Public Hall, George-street, Croydon.
,, 30 ...	Holborn	
,, 30 ...	Maidstone	"The Palace," Maidstone.
,, 30 ...	Swansea	Temby Hotel, Swansea.
,, 31 ...	Hull	71, Prospect-street, Hull.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 15.—Mr. Thomas Bedding in the chair.

Mr. R. Child Bayley was elected a member.

A discussion took place as to the qualities of negatives yielded by commercial [illegible], Mr. J. A. Sinclair showing film negatives which were generally considered excellent.

Mr. COLE showed a negative having well-defined markings of a pictorial nature, and asked for the cause. It was suggested by Mr. DENENHAM that the markings might have been caused by tissue paper employed in packing; Mr. Cole, however, said that the plates were packed face to face.

The remainder of the evening was devoted to an exhibition of lantern slides.

Hackney Photographic Society.—December 13, Mr. F. Houghton presiding.—Mr. Hudson passed around a plate which had been very badly stained and which Mr. Beckett had cleared of iridescence by Farmer's reducer. Mr. Wire showed some flash-light work he had done with the use of a Todd-Forret lamp. Mr. R. Beckett passed around a photograph of himself which had been taken by flashlight by Mr. Nievsky with his combined apparatus. Mr. A. Barker showed a photograph he had taken of a spark from the Wimshurst electric machine. The Chairman handed round a broken lantern slide which was valuable to him, and asked for opinions as to how to repair it. Mr. Dear advised using Canada balsam to cement plain glass on to it, then, removing the cover, print a negative from it by contact in diffused light. Mr. R. Beckett advised using a roasting jack. Major Bruno's design of a hand camera was then explained by Mr. Beckett. It was made by Mr. Park, of Kingsland. The chief points were: a dark slide or roll-holder could be used, extending front, sliding focusing screen, swing-back, rising front, &c. Mr. Hudson showed his Thornton-Pickard shutter. He had a hole in the blind, but by using a small piece of court plaster it was successfully repaired. Mr. Walter Woodbury then gave a demonstration of the Paget print out lantern-slides and opal plates. A special frame was necessary to print opals, and he showed one the arms were bringing out, capable of taking any size upwards, from lantern size to half-plate. Lantern plates could be successfully printed in ordinary quarter-plate frame, as the density could easily be judged by looking through one side. Perfect contact was absolutely necessary with lantern slides, as otherwise fuzziness would be caused, a defect fatal to lantern slides. The lecturer then made some exposures with the platinotype lamp successfully. Ordinary toning bath can be used, but if combined bath is used the density must be a little greater. Several members took samples, and promised to bring up results next lantern night.

Elizabethan Photographic Society.—Mr. T. E. Freshwater, F.R.M.S., of London, gave a lantern-slide exhibition entitled *Rambles*, in the hall of Queen Elizabeth's School, Barnet, on December 15.—The views represented incidents of Her Majesty's jubilee celebration; scenes at Antwerp; and the habits of bees and the art of bee-keeping. Mr. T. Samuels, a vice-president of the Society, introduced the exhibitor to the audience, who highly appreciated his interesting entertainment. The series of bee slides were specially admired.

Croydon Camera Club.—Lantern Night, the President in the chair. It was announced that Mr. G. R. Whitehead resumed his secretarial duties.—The following showed slides: Messrs. Maclean, Oakley, Merton, Garden, Sladden, and Holland. Mr. Neeves also exhibited a large collection of prints, mainly taken at club excursions. The next meeting will be held on January 2, when a debate on *What is now the best printing process?* will be opened by the President. Several members have intimated their intention to advocate various processes and will show prints in illustration of their contentions.

Croydon Microscopical and Natural History Club (Photographic Section).—December 16, Lantern Evening, Society of Arts' loan series of Chicago slides.—The PRESIDENT (Mr. Lovett) read a short paper, which after briefly reviewing the history of the city, was devoted to an account of the World's Fair to be held in 1893. The slides included views of the city and the principal public buildings, sketches of the Exhibition buildings and grounds with photographs of them, from which, as they were almost finished, a good idea was obtained of the general appearance which the Exhibition would present when opened.

Greenwich Photographic Society.—December 7, Rev. Brooke Lambert in the chair.—Mr. T. E. FRESHWATER read a paper on *Photography among the Bees* (see next number). At its conclusion, in reply to a query from the Chairman, Mr. Freshwater said he did not think that modern methods of apiculture had at present affected the evolution of the bee. Replying to a further question, the lecturer pointed out that if not interfered with the bee is enabled to withdraw its sting by a corkscrew-like motion; but, if not allowed time for that after-insertion, the sting was usually left embedded in the wound. At the conclusion of Mr. Freshwater's lecture, a vote of thanks was passed to him. The Chairman announced that the Society's next meeting would take place in that building (Physical Lecture Hall, Royal Naval College) on Wednesday, January 4, 1893, at 8 p.m., when Mr. E. J. Wall would give a demonstration in *Isochromatic Photography*.

Derby Photographic Society.—December 13, A lecture and demonstration on the *Platinotype Process*, was given by Mr. S. G. B. WOLLASTON. Mr. R. Keene occupied the chair, and there was a large attendance.—In speaking of the treatment of platinotype paper, the lecturer emphasised the great importance of keeping it well stored and absolutely free from damp. With regard to development he might safely say that the hot-bath process was doomed, and was fast becoming superseded by the cold-bath method of development, which had been greatly improved of recent years, and possessed many points in superiority over its predecessor, which photographers had not been slow to recognise. Among other advantages mentioned were, that at any stage of the process development may be entirely stopped. It may also be retarded or localised, and over-exposure completely rectified by the aid of glycerine. These advantages, coupled with the results, which are highly artistic, placed this process in a foremost position amongst photographic sensitised papers. The lecturer illustrated his remarks with practical demonstrations of the results which can be obtained by the many different methods of treatment.

Brechin Photographic Association.—For the past year this Association has been engaged preparing slides to illustrate linen-manufacture. These are now completed, and on Wednesday evening, December 14, Mr. D. H. SAUNDERS, Dundee, gave a lecture entitled, *Linen and its Production*, in the City Hall. The lecture was illustrated by seventy slides prepared by the members of the Association, and was listened to by an audience of nearly one thousand persons. The lecturer was thoroughly at home in his subject, and slides of the processes of bygone days, such as the spinning and Pirn wheels, hand looms, &c., gave him an opportunity of referring to the past history of linen-manufacture in Scotland, with all its romantic incidents. The slides were considered to be most admirable illustrations of the processes, and the positions of the people at work very natural.

Glasgow Photographic Society.—December 15, Mr. William Lang, jun., F.C.S., President, in the chair.—Mr. Lang delivered his presidential address (see page 825). Dr. Paul Jeserich's paper, *Photography and its aid in the Detection of Crime*, with lantern illustrations followed. Mr. John Stuart showed a series of Zeiss lenses made of the new Jena glass. The Tachyscope, an instrument showing phases of motion by means of photography, was shown to members.

Photographic Society of Philadelphia.—November 9, the President (Mr. Joseph H. Burrows) in the chair.—It was also announced that the President had appointed the following Committee to conduct the Sixth Annual Photographic Exhibition under agreement with the Society of Amateur Photographers of New York and the Boston Camera Club: Robert S. Redfield, John G. Bullock, Charles R. Pancoast, Charles L. Mitchell, M.D., and Edmund Stirling. The exhibition will be held April 17-29, 1893, in the galleries of the Pennsylvania Academy of Fine Arts, and every effort will be made to make it the most interesting and successful of the series yet held. A number of photographic novelties were shown by Mr. Morris Earle, among which were celluloid trays of special construction and made in various colours, a transparent tray with a well at one end to hold the developer when tray was raised to examine the negative through the bottom. Dr. Mitchell showed negatives made under similar conditions with the Ross concentric lens and Ross portable lens, which afforded an opportunity for studying the comparative advantages of the two lenses for different classes of work.

Photographic Society of Japan.—November 4, Mr. G. Gilbert in the chair.—Mr. Tanaka showed some results of experiments in collotype. They were not quite perfect, but were remarkable as the results of first attempts in this difficult branch of photo-mechanical work, the more especially as Mr. Tanaka had worked entirely from written instructions. After trying various more or less complicated formulæ, he had settled on the following:—Bichromate of ammonium, 1 gramme; pure gelatine, 6 grammes; water, 70 c.c. He had found an admixture of isinglass, even in small quantities, the reverse of an advantage. Messrs. W. K. Burton and K. Ando showed the results of experiments in orthochromatic work. They had set themselves the task of getting photographs showing a brilliant pure scarlet, a bright but darkish blue, and a pure chrome yellow, in their true value. If these could be shown truly, all other colours could. They had succeeded best with a mixture of eosine and cyanine. Eosine was a strong sensitiser for the yellow and the green, cyanine for the red and the orange. The following formula was used:—Cyanine solution, 1 part in 1000, 1 part; eosine solution, 1 part in 1000, 1 part; ammonia 10 per cent. solution, 4 parts; water (distilled), 14 parts. The plates were bathed for two minutes and dried. Of course such plates need the extremest care in working. A yellow screen was used with plate-glass sides, enclosing a quarter of an inch thickness of the following solution:—Picric acid, 1 part; water, 500 parts. The intense but very light yellow colour of a picric acid solution seemed particularly well suited to orthochromatisation. With a denser solution than that mentioned it was possible

to overdo the orthochromatisation. The exposure needed was ten times that with the same plate untreated, but without any yellow screen. Mr. J. Favre-Brandt sent a paper on *Pinhole Photography* (see next number), along with samples of the work done and of the pinholes used. It was agreed that these samples were remarkably good. In fact, in some respects they were better than photographs taken with a lens, showing a pleasing softness. The exposures had been from one to about five minutes. The unusual excellence of these results was probably due to the great care with which the pinholes were prepared. They were in thin plates of nickel, were perfectly circular, in each case of the exact diameter that would give the finest definition with the focal length used, and the edges were delicately bevelled. Mr. Kajima Sebi showed a hand camera in the form of an opera glass. The arrangement, on the whole, was ingenious, but samples of work done by the camera were much under-exposed. The lens working at about one-sixteenth was far too slow for this kind of work, especially as the shutter was one that gave a bad coefficient of light. Further, there was no means of adjusting the focus. Mr. T. Kiyokawa presented the Society with a bottle of "retouching solution." This was to be applied to the plates whilst still wet, after fixing and washing. It was evidently an aqueous solution. Mr. Tanaka was asked to take the bottle with him, to try the solutions, and to report to the next meeting.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

LOCAL REDUCTION OF NEGATIVES.

To the EDITOR.

SIR,—Your article in last issue on "Local Reduction of Negatives" interested me, as I have had some experience in that way, and I am pleased to be able to give you a little "tip" as to the best material to use as an "accelerator" for the "rubbing-down" process.

Where only slight and delicate reduction is required, plain alcohol applied on a soft and *flat* pad is quite sufficient and *better* than the application of any assisting material, but it is too tedious to employ where a considerable amount of density or space has to be reduced, as in the case of a sky in a large landscape negative. I have tried finest ground and sifted cuttlefish and pumice-stone powders, but they are too coarse in grain, and more frequently result in scratches, which are almost hopeless to repair afterwards, and the remedy is worse than the disease; but, if you will experiment with *precipitated chalk*, I think you will find it admirable. There is great cutting power in it without any tendency to scratch, if the powder is kept carefully free from extraneous dust or grit whilst in use.

The rubbing pad (for small work wash-leather is best, and for larger surfaces an *old* silk pocket-handkerchief or the softest *undressed* muslin) should be fairly thick and flat, and as large in surface as the space to operate on will permit. It should be kept well soaked with the alcohol, and lightly touched on the powder occasionally so as to take up a small portion of it, and applied lightly to the plate in ever-varying *circular* sweeps, crossing each other to avoid unevenness in reduction. It is surprising what a quantity of "mud" is raised from the deposit of silver, but this can be readily removed when the work is completed by a good wash with clean muslin and alcohol, and the gelatine surface is left in quite a highly polished condition, too smooth, in fact, to have any tooth for the retouching pencil without some application of "medium" for that purpose. The process is somewhat like planing a surface of wood, the denser portions of the dry film stand up higher than the half-tones and shadows, and if the rubbing pad is kept as *flat as possible* these protuberances get the cutting action of the rubber, whilst the lower surfaces are slid over and missed, and therefore the reduction takes place more on the extreme high lights than any other part of the film.

It appears to be better for use than liquid reduction by chemical means, because, in such case, the solvent action is more marked upon the delicate deposits of shade detail and half-tones, and the picture suffers in "tonality" when applied all over the surface, and it is most difficult to confine liquid reducers to any particular parts of the surface. Personally, I should be glad to know of any process by which skies in landscape work could be *held back* from gaining too much density whilst developing. "Prevention is better than cure" in such matters, and some solution which would prevent agnition of undue density without stopping general development would be very convenient to apply to skies with a soft brush whilst the remainder of the plate is progressing to the desired density before fixing.

If you, or any readers of this, can give the hint, it would be acceptable to—Yours, &c., GEORGE BANKART.

December 19, 1892.

ORDINARY METHYLATED SPIRITS.

To the EDITOR.

SIR,—It may be interesting to some of your readers to know how to procure ordinary methylated spirit—*i.e.*, the old kind, without the addition of mineral naphtha. I therefore briefly sum up the correspondence, &c., with the authorities.

November 23.—Wrote to the Inland Revenue Office for a permit.

November 26.—Reply received, stating that the subject of my letter would be brought under the consideration of the Commissioners without delay.

November 30.—Received a visit from the district supervisor, who asked three questions, viz.—1. Where did I intend using the spirit? *Answer*—On the premises. 2. For what purpose? *Answer*—Making emulsion. 3. How much should I require annually? *Answer*—As small a quantity as one gallon. The supervisor stated that five gallons was the minimum, but possibly the Commissioners might allow me to have one gallon at a time.

December 6.—Received a permit for five gallons annually "for use in the preparation of emulsion for lantern slides."

December 7.—Wrote asking if I could have the five gallons, say one gallon at a time.

December 10.—Supervisor called with a book containing eight requisitions, stating that he should call on me four times a year to look at the book and see the amount of spirit in stock. Wrote once more to the Commissioners, asking if they would allow me to have one gallon at a time.

December 17. Received the Board's ultimatum, stating that ordinary methylated spirits cannot legally be obtained in quantities less than five gallons, and they were not prepared to recommend a change in the law relative to this minimum.

They further stated that their authority to receive such spirit remains in force so long as the authorised person occupies the same set of premises, and continues to use the spirit for the authorised purpose only.—I am, yours, &c. LEWIS MEDLAND.

Kimberley, North Finchley, December 19, 1892.

AMIDOL FOR LANTERN TRANSPARENCIES.

To the EDITOR.

SIR,—I have read with much interest an article by Mr. H. E. Davis in your ALMANAC on "Amidol for Lantern Transparencies," but would like to ask the author if the formula for No. 116 is correct. It stands thus:—

Amidol	1 part.
Metabisulphite of potash	3 parts.
Water to	60 ,,

Take of this half an ounce and add—

Bromide ammonium (ten per cent. solution)	1 ounce.
Carbonate Potassium ,, ,,	½ ,,
Water to	3 ounces.

Is not the amount of bromide ammonium too great, as it means about 5 : 1?—I am, yours, &c., E. HEALY.

10, *Endymion-terrace, Finsbury Park, N., December* 19.

PHOTOGRAPHY IN SOUTH AFRICA.

To the EDITOR.

SIR,—In your issue of the 21st of October, just received, appears a letter headed "Photography in South Africa."

I presume from the contents that Mr. Ellerbeck lives in Johannesburg and perhaps imagines that Johannesburg is South Africa. At any rate some of his statements are misleading when made under such a heading.

There are a great number of amateurs throughout the colony, indeed considering the white population, I think their number is quite as large in proportion as in most of the provincial towns of England.

Two or three statements I must take special exception to, viz., "There is very little beautiful scenery here," "Every one is confoundedly lazy," and "Detective cameras are never seen." To take the last first. I am sure I am within the mark when I say there are at least fifty hand cameras in frequent use in Cape Town. There are also a number in Kimberley, Port Elizabeth, Grahamstown, King William's Town, Queenstown, and East London to my own personal knowledge; and in all these towns (except, perhaps, the last two named, of which I am not quite sure) there are photographic clubs, whose membership consists almost entirely of amateurs.

I fancy a reference to our Ilford friends as to the number of quarter plates used in the Colony would confirm my statements.

Our Club album here and my own collection of views from different parts of the Colony completely refutes the statement as to there being very little beautiful scenery.

I am not personally acquainted with Johannesburg, so it may possibly be true of that portion of the Transvaal.

It may also be true that people are "confoundedly lazy" there. I am not in a position to confirm or deny it; certainly it is not true of the larger business towns in the Colony.

Neither does the statement as to scarcity of water affect the towns mentioned above, as they all have a very efficient water supply.

Then, as to the "cold winter days," my own experience of winter in the Colony (east and west) for some eighteen years has been that it corresponds with a *very mild* English spring, and, with the exception of

Kimberley and some of the more northern villages, we rarely get snow, except on the tops of the higher mountain ranges, and such a thing as ice (excepting manufactured) is a rare curiosity.—I am, yours, &c.,

HON. SECRETARY, *Cape Town Photographic Club.*

THE BENEVOLENT.

To the EDITOR.

SIR,—I enclose a brief report of the last meeting of the Benevolent Committee, and shall esteem it a favour if you will give me space to make a special appeal for subscriptions *before the end of the year*. I regret that, in sending the usual applications to old subscribers, I made the mistake (easily possible to a new hand) of stating that our financial year ended on February 28, 1893; out, though the annual meeting is held about that time, I find that the balance-sheet is made up to December 31.

The Association has been very well supported lately by the larger subscribers and donors, but we hope to have a great many more of the smaller annual subscriptions (minimum, half-a-crown). The money spent in relief will probably prove to be less than last winter; but there is every prospect of considerable calls during the next few months, which will, of course, not come into the next balance-sheet. The diminution in the relief paid in 1892 arises from two causes: (1) From the fact that in the first three months of the year there were no applications (though the latter half of the season is generally the busiest), and (2) from the fact that the Committee has been able to find work instead of money for some of the most pressing cases in the present season.

I hope to receive a general and generous response while the Christmas good-will warms the breasts of your readers.—I am, yours, &c.,

H. SNOWDEN WARD, *Hon. Sec.*

Memorial Hall, E.C., December 19, 1892.

FILLEBROOK ATHENÆUM PHOTOGRAPHIC EXHIBITION.

To the EDITOR.

SIR,—Will you kindly allow me through your columns to say, in reply to applications already received, that entry forms and rules of above Exhibition will be ready very shortly? In the meantime it may be of interest to mention that Messrs. F. P. Cembrano, jun., Walter L. Colls, and John A. Hodges have kindly promised to act as Judges; also that there will be no distinction made between amateurs and professionals, nor any division into classes, excepting a champion class for previously medalled exhibits.—I am, yours, &c., JOSEPH W. SPURGEON, *Hon. Sec.*

Drayton-road, Leytonstone, Essex, December, 17, 1892.

Exchange Column.

*** No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance.*

Will exchange half-plate camera with two slides for 5×4 camera and lens.—Address, J. BENNETT, 38, James-street, Swansea.

Wanted whole-plate Euryscope lens, in exchange for 15×12 view Ross and thirteen guinea Facile bicycle.—Address, E. J. LESTER, 7, Forest Hill-road, S.E.

Will exchange five dozen 12×10 hand-ground (new) opal plates (not sensitised) for lantern slides.—Address, J. REID, 1, Ford-street, Hyde-road, Manchester.

Wanted, a half-plate or whole-plate tourist's camera for gent.'s nine-carat gold ring, large easel, and dental vulcaniser.—Address, W. REYNOLDS, 9, Princes-street, Ulverston.

Will exchange a good modern whole-plate view lens, rotating stops, or other apparatus, for a good burnisher.—Address, W. E. SEATER, Albany Villa, Kentish-road, Belvedere, Kent.

Exchange THE BRITISH JOURNAL OF PHOTOGRAPHY, 1883 to 1892, also five volumes, unbound, of the *Photographic News*, for backgrounds or accessories.—Address, J. ATKINS, 46, Stamford Hill, N.

Exchange new cottage piece and balustrade, in five pieces, in good condition, for cabinet, quick-acting, portrait, short-focus lens of good make.—Address, G. W. SHERMAN, Photographer, Great Yarmouth.

Wanted Eastman roll holder, 8½×6½; exchange postage-stamp camera with nine lenses, or Victoria camera with four lenses, or rapid rectilinear lens, sixteen-inch focus.—Address, F. EARL, 27, Foregate-street, Worcester.

Wanted a whole-plate portable camera with all movements, long extension and three double slides, in exchange for a first-class Wheeler & Wilson's lock-stitch family sewing machine, on nice stand and in perfect order.—Address, W. L. NASH, 27, Blackfriars-street, Edinburgh.

Exchange half-plate camera, double slide and stand, six-inch burnisher, Indian curtain for studio, and THE BRITISH JOURNAL OF PHOTOGRAPHY, three years, 1890-1892 to present time (all in perfect, good condition), for 12×10 outdoor camera and one or two double slides.—Address, E. KRAUSS, 162, King's-road, Reading.

Wanted, offers in exchange for the following:—THE BRITISH JOURNAL PHOTOGRAPHIC ALMANACS for 1879, 1885, and 1892; *Photographic News Year-book* for 1868, 1885, 1890, and 1887; *Photography Annual*, 1891; *Studios of Europe*; *Retouching*, by Burrows & Coulton; *Zincography and Chemists and Druggists' Directory*.—Address, R. SHALLEY, 12, Park-road, Blackburn.

WEST LONDON PHOTOGRAPHIC SOCIETY.—December 27, Lantern.

PHOTOGRAPHIC CLUB.—December 28, Monthly Lantern Meeting. January 4, *Collodio-chloride Printing.*

MR. JAMES DOWNEY, Photographer, South Shields, has been placed on the magistracy of that borough.

PUTNEY PHOTOGRAPHIC SOCIETY.—January 9, Mr. Gotz on *Toning Gelatino-chloride Paper*, lecture and demonstration at eight p.m. at the Gymnasium, Charlwood-road.

IN reference to recent correspondence on the subject in our pages, we are informed that Mr. Shapoor N. Bhedwar, of Bombay, has withdrawn his resignation of membership of the Photographic Society of Great Britain.

CHICAGO EXHIBITION.—The Royal Commission for the Chicago Exhibition are arranging for a series of introductions to the different sections of the Catalogue of the British Section. Captain Abney will deal with the subject of "Photography." The general introduction to the Catalogue will be written by Sir Henry Trueman Wood, the Secretary to the Royal Commission.—*Athenæum.*

FOR the purpose of presenting the medals and diplomas awarded by the Judges in the photographic competition held in connexion with the recent Stanley Show at the Agricultural Hall, the Stanley Cycling Club are giving an invitation "Bohemian Musical Evening," at which ladies will be present, and will take place at the Wortley Hall, Seven Sisters-road, N., on Monday, January 9. In addition to the musical part of the programme the slides received in the competition will be shown in the lantern, and other interesting and amusing items are being arranged. Admission will be by tickets, which can be obtained by application to Mr. Herbert Smith, 29, Finsbury-pavement, or Mr. William Goddard, the Hon. Secretary of the Stanley C. C., 261, Seven Sisters-road, N.

PHOTOGRAPHERS' DINNER IN SHEFFIELD.—The first social gathering of professional photographers in Sheffield took place December 16. The chair was occupied by Mr. J. J. Sadler (Holmes, Sadler, & Holmes, Manchester), and Mr. MacIver, of Leeds, was in the vice-chair. One of the objects of the assembly was to signalise the establishment of a studio in the town (at the new *Independent* Offices) by Mr. Crosby, of Rotherham. He was highly spoken of by the Chairman, Mr. MacIver, and Edison, and the latter, in the course of his remarks, said he had gone up to Mr. Crosby's studio in the elevator, and found himself almost "shot into" the sitter's chair a few seconds after being in Fargate. Mr. Edison also spoke of the labours of the Chairman in the formation of the National Association of Professional Photographers. Mr. Crosby, in tendering thanks, said it had always been his endeavour to raise the status of his profession.

THE BENEVOLENT.—Meeting of committee held December 14, Mr. W. Bedford in the chair. An application for a loan of 8*l.* to pay arrears of rent and redeem lenses from pawn was considered. The Secretary had corresponded with the applicant, who said he could not give references, and, as the case seemed very urgent, had made a preliminary advance of 2*l.* on security of pawn tickets. The correspondence was carefully considered, the Secretary's action was confirmed, and he was instructed to redeem and forward the lenses, holding two pawn tickets for other goods as security, and to report to the applicant that the Benevolent could not grant further assistance without references. An application was read from a crippled photographer who had been previously assisted by the Association, and who now applied for a grant to redeem from pawn a lantern bought for him by the Association two years ago, which was his sole means of subsistence. An accident during the summer was the cause of his again getting into pecuniary straits. The sum asked for, 3*l.*, was granted as a loan. The Secretary reported that an application for immediate relief had been made to him at the office of the Association by a man evidently a photographer, who stated that he was penniless and ill, and was walking from London to his home in the provinces, over a hundred miles away. The Secretary had offered him a good meal and to pay his railway fare, an offer which he accepted with great profession of gratitude when he thought the money was going to be given him, but rejected with scorn and anger when he found that the Secretary intended to personally purchase the ticket and see him into the train. The resignation of Mr. H. D. Atkinson, whose removal from London prevented his continuing on the committee, was accepted with regret, and Mr. R. Child Bayley was elected in his place. Six new members were elected.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES. Meeting of Delegates, December 16, Mr. W. Bedford (Photographic Society of Great Britain) in the chair.—Two more Societies, the Hackney Photographic Society, and the Cheltenham Amateur Photographic Society, were announced as having become affiliated. Mr. Marchant (North Middlesex Photographic Society) brought forward the report of the sub-committee appointed to make recommendations with regard to the lectures on photogravure. The report contained a suggestion that a charge of one shilling for the course be made to members of affiliated Societies, and five shillings to outsiders, and that the secretaries of the various Societies should ascertain as nearly as possible how many of their members were likely to attend, so that arrangements could be made accordingly. Owing to circumstances that had transpired since the report was drawn up, the matter was referred back to the committee, who were instructed to arrange if possible to hold the lectures in the month of February, Friday being suggested as the most convenient day and one which would not clash with many photographic meetings. It was proposed by Mr. Steele (Leeds Photographic Society), seconded by Mr. Mackie (North London Photographic Society), and carried, that the whole question of the lectures should now be left in the hands of the sub-committee to carry the matter through. Mr. Steele (Leeds Photographic Society) and Mr. Walker (Leeds Photographic Society) gave particulars of a lecture on photogravure delivered in Leeds; the former also suggested that it should be strongly urged upon the various Societies that they should provide a set of lantern slides for circulation. His Society had taken the lead in this matter, although hostile critics had styled them fossilised, and he was rather surprised that some of the younger Societies had not taken the matter up. He trusted that no opportunities would be lost of appealing to the secretaries to bring this matter up.

Answers to Correspondents.

All matters for the text portion of this JOURNAL, *including queries for "Answers" and "Exchanges," must be addressed to* "THE EDITOR," *2, York-street, Covent Garden, London. Inattention to this ensures delay. No notice taken of communications unless name and address of writer are given.*

**** Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & CO.," *2, York-street, Covent Garden, London.*

A. R. D.—See leading article, p. 49 of present volume.

C. H. OAKDEN.—Received. Thanks. We have had no further communication.

P. A. T.—Your trouble is like that of many others just now. See sub-leaders on the subject in the present issue. So far as we can see, these will meet your case.

J. H. AINLY, of 426, London-road, Lowfields, Sheffield, desires to communicate with Mr. Noel B. Kenealy, who last week wrote us concerning collodion preservative processes.

E. A. SHIRAFS.—Procure the *Autotype Manual* (the Autotype Company, 74, New Oxford-street) and study the numerous articles that have appeared in this JOURNAL on carbon printing.

J. NICHOLSON.—After applying French chalk to the glass in the usual way, coat it with collodion, immerse in a dish of water to remove the ether and alcohol, and then squeegee down the wet print.

J. SHUTER.—The glass can be coloured by varnishing it with negative varnish in which a suitable colour has been dissolved. A large proportion of the coal-tar colours are soluble in alcohol. Any of these will serve the purpose.

PYRO.—Whether you would have a legal remedy would, in our opinion, depend upon the nature of the correspondence that passed before the despatch of the telegram. On such meagre *data* as that which you supply it is impossible for us to advise you.

A. Y. E.—If space will allow, do not have the studio less than thirty feet long. This will permit of full-length portraits to be taken in tolerably good perspective. A provision may also, with advantage, be made for taking the camera outside, at the end, when groups have to be taken.

W. ALBERT.—In making up a solution of nitrate of silver, distilled water should always be used. The milkiness you speak of is caused by the sodium chloride in the water reacting with the silver nitrate to form a precipitate of silver chloride. Procure a manual of elementary chemistry.

J. KIRK.—1. Unless the paper is Hollingworth's make, we do not know whose it is. Any dealer in artists' materials will, however, supply it to order. Or, if a few reams at a time can be taken, it may be obtained through some of the wholesale stationers. 2. There is a shop near the bottom of Fleet-street where we have seen the things exhibited for sale.

JUNO writes: "Some say that prints ought to be washed for twelve hours at least, others say they can be equally as well washed in three or four hours. Which is right?"—All will depend upon the "washing." With proper treatment a print can be as perfectly freed from hypo, provided it is perfectly fixed, in an hour or less, as it can be with twenty-four hours' merely soaking, with an occasional change of water.

R. T. SCOTT asks what prospect a good photographer and retoucher would have in Australia?—Australia is a large place; but, so far as our knowledge goes and that obtained from correspondents, all the large towns are well supplied with photographers, and competition is as keen there, both as regards quality and price, as it is here. Perhaps some reader may be able to supply more definite information than this.

JAS. MARSHALL.—1. The design of the studio would do very well, but the ridge should certainly not be lower; indeed, it would be better if a foot higher, and it might with advantage be six inches higher at the eaves. 2. The lenses of the firm named have an excellent reputation. 3. You will find instructions for making a camera bellows in an article on the subject by Mr. J. T. Hackett in a recent volume of the ALMANAC.

S. W. J. writes: "I wish to take the meet of one of the hounds here the week after next. Of course I shall use a hand camera. Can you tell me what plates to use, and what speed to set the shutter at? Its quickest rate is one-hundredth of a second."—This is a question impossible to answer. The only advice we can offer at this season is, Use the quickest plates obtainable that suit your working, and adjust the speed of the shutter to the light, whatever it may happen to be at the time.

BEAUCHAMP writes:—"Will you inform me if you think that by advertising in your paper I could get a situation in a photographic establishment, where, in return for services rendered, I could be taught retouching. I may mention that I am an amateur photographer (age forty-one), and want to get an insight into the trade so as to commence business myself as soon as possible?"—We should think that there is a possibility of a photographer being willing to impart the necessary tuition in exchange for equivalent value in services.

R. MCKENNON.—It is quite a matter of agreement between party and party; but, if the agreement is made too one-sided, it will not hold good in a Court of Equity. We should say that an agreement to the effect that an operator on leaving the service of his employer was not to enter the service of another photographer, or commence business on his own account in Scotland or the border counties, would certainly not be valid in a Court of Law. Such an agreement might hold good if confined to a single town, and, if the consideration were in accordance, to perhaps to one or two counties. Better consult a solicitor.

A. R. SPENCER.—There is nothing in your communication but what is well known. Celluloid is a highly electrical substance when dry. The manufacturers of the material are fully aware of this.

ZENO.—Evidently you are a novice, and are not fully cognisant of what qualifications are requisite in an operator for a photographic studio. The simple fact that you are "fully up to developing all the leading makes of plates, and have taken excellent portraits in the garden," will not avail much in a portrait studio, except as an apprentice, or, perhaps, as an improver. The principal qualifications are lighting, posing, and, above all, tact with sitters, things only gained by experience. Technical school certificates, as a matter of fact, are looked upon very lightly indeed by practical photographers when engaging assistants.

LUX.—1. A very considerable majority of the lantern lenses in use are defective in regard to flatness of field, but this we are happy to say is not the case with all of them. Several opticians have devoted special attention to this defect, with the result that excellent definition at the sides as well as in the centre can now be obtained. A good doublet or rectilinear constructed for camera use would certainly answer for projecting, but it would not transmit so much light as a properly constructed lantern objective. 2. Nine inches focus would be suitable for your purpose. 3. A camera lens would not be likely to suffer from the light or heat.

T. A. SHAW.—This correspondent says: "In burnishing my prints, one side always has a much higher polish than the other. This would seem to indicate that the pressure on one end of the bar is greater than on the other. But, as there is only one central screw to adjust the bar, what can be done?"—The only way we can see is to do away with the central adjustment, and have two others fitted near the ends of the burnishing bar. If the burnisher is a small one, perhaps the difficulty may be met by passing the print through the machine several times, reversing it each time so that both sides in turn get the greater pressure.

SICCATIF writes: "I am troubled very much with the damp attacking everything I have in the studio, in spite of the heating stove. I am aware that a wooden building is not equal to a stone-built one for resisting the action of the atmosphere. I don't want to use the waterproof felting, on account of the objectionable smell of tar it gives off; but is there not some other suitable non-conducting material or solution that could be applied in the inside of the building? I shall feel much obliged if you can help me in this matter."—The waterproof felting should be applied outside the building, it would answer its purpose better there, and then there would be no objectionable smell within. Or the outside can be covered with sheet zinc. Another way would be to line the studio with wood, allowing a few inches between the inner and outer walls, and filling the intervening space with sawdust. Of course, in this case, the outer walls must be rendered perfectly waterproof or the end sought will not be secured.

HACKNEY PHOTOGRAPHIC SOCIETY.—Arrangements for January, 1893:—All meetings at 206, Mare-street. 3, Smoking Concert. Members willing to add to harmony of evening, please communicate with J. Vining, 60, Kenninghall-road, N.E.; or, Hon. Secretary. Mr. Penny has kindly promised use of piano. 10, *Some Contributories to Artistic Effect*, by Mr. A. Horsley-Hinton. 17, *Lantern Slide Colouring*, by Mr. S. J. Beckett. 24, *A Day in the Zoo* (Lantern Night) by Mr. Lewis Medland. 31, *Transparencies by the Carbon Process*, by Mr. W. E. Debenham.

FORTHCOMING EXHIBITIONS.

1893.		
February 1	.....	*Cleveland Camera Club. Hon. Secretary, J. J. Hallam, 11, Amber-street, Saltburn-by-the-Sea.
,, 7, 8	.....	Rotherham Photographic Society. Hon. Secretary, H. C. Hemingway, Rotherham.
,, 16–18	.....	*Woolwich Polytechnic Photographic Society. Hon. Secretary, W. Dawes, 145, Chesnut-road, Plumstead, S.E.
,, 18	.....	Holborn Camera Club. Hon. Secretary, F. J. Cobb, 100 High Holborn, E.C.
March 1, 2	.....	*Fillebrook Athenæum Photographic Society. Hon. Secretary, Joseph W. Spurgeon, 1 Drayton Villas, Leytonstone, Essex.
April 17–29	.....	*Photographic Society of Philadelphia. Hon. Secretary, R. S. Redfield, 1601, Callowhill-street, Philadelphia, U.S.A.

* Signifies that there are open classes.

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1704. Vol. XXXIX.—DECEMBER 30, 1892.

INDIA TINTING OF PHOTOGRAPHS.

It is astonishing to what extent the mind and judgment are influenced by simple physical agencies. We look at an outdoor scene through glasses of various colours; through red, and we instinctively feel the heat of Calcutta, with its copper sky; blues of certain phases of tint transport us to the Arctic regions or at the least to winter in our own land; green to moonlight, and so forth through the innumerable shades of colours now produced. Spring, summer, autumn, heat and cold are alike suggested by such agencies.

As in nature, so with the examination of photographs and paintings. The late Sam Bough could paint winter scenes so warmly, that while snow lay everywhere around one almost felt impelled, even in chilly December, to throw off one's coat and go outside to partake in such pastimes as were suggested by the composition.

Take up a photograph of almost any kind and observe the effect on the judgment of interposing glasses of various colours between it and the eye. Just such a similar effect is produced on the observer by staining the photograph itself, a fact of which albumenisers and other preparers of sensitive paper seem to be well aware, as witness the rose-tinted or pearl-tinted papers now in commerce.

We some years since indicated the means by which photographs may be immensely improved by having a suitable tone imparted to the paper after they are finished, so far as the mere photographic operations are concerned. If, previous to being dried after washing, the prints are immersed for a few minutes in water in which a few drops of any of the aniline dyes have been dissolved, Judson's dyes for instance, they will be found to have acquired an even and beautiful tint that will be more or less permanent, that is, if they be not such colours as will bleach under protracted exposure to sunshine. It was in this way that some sensational and greatly admired moonlight views of Venice, still to be seen in the shop windows of printsellers, were produced, the white moonbeams tipping the waves and forming the high lights on some of the buildings being bleached out by judicious touches of a pen dipped in a diluted acid, by which the colour of the aniline is discharged. Hydrochloric or other acids serve either to discharge the dyed colour altogether, as in the formation of a moon, or to lower the tone when by an error of judgment this has been too pronounced. The degree of dilution is the factor by which the reduction of the tint is determined.

We have not found any of the aniline dyes produce quite such a good India tint on a photograph as can be imparted by a simple aqueous infusion of coffee. This, as our lady readers are aware, forms the means by which *old* lace is created out of the newer productions of that material, and we are aware of one gentleman, Mr. Weir Brown, who has been employing it of late with much success.

In such trials as we have made in India tinting, we have tried both coffee and tea infusions with nearly equal success, the strength of these being about such as that adopted in certain dry-collodion processes of a past period. But the balance of advantage seems to lie in favour of the former both in tone and in principle. The tannin in tea is not perhaps great, still we know that it reacts upon certain silver salts. This will be realised when we state that we have repeatedly developed negatives by its agency, and hence an application of such a potent agent to a silver photograph would certainly be a risky proceeding. Coffee infusion, on the other hand, would possess no harmful action; we at any rate have not found it to do so.

CHANGING BOXES *VERSUS* DARK SLIDES.

Although the necessity for stopping outdoor work altogether during the winter months does not exist now as formerly in the old dry-collodion times, still the shortness of the days leaves at the disposal of most amateurs a good deal of leisure that during summer would be devoted to printing or other purposes. This period of enforced idleness can scarcely be used to better purpose than for reviewing the past and preparing for the coming season.

The prominent feature of the past two or three seasons has been the almost universal adoption of the hand camera, and, though the number of these instruments is still on the increase, there are not wanting signs of an inclination to return to the use of the stand, and to larger sizes; but, in reverting to the use of the older form of instrument, the recollection of some of the conveniences of the hand camera will remain, and it is probable that the style of the ordinary camera will ere long undergo considerable modification from the introduction of many of the ingenuities of the smaller instrument. In no direction is this more likely to occur than in the method of carrying, storing, and changing the plates or films.

The double dark slide has for very many years maintained the premier position as the means for the purpose, but there is little use in attempting to deny the inconvenience that arises from the bulky character of separate slides, or the care that is necessary to keep them in working order and to prevent their admitting light to the sensitive films. So delicate is their construction that each hinge and shutter is a source of constant anxiety, and, considering the knocking about that the average slides have to undergo, it speaks volumes for the skill of the manufacturer that their lives are not much shorter and the accidents much more numerous than they are. A set of double slides too, for a dozen plates, more-

over, costs, if of the best construction, a considerable sum, as much as, indeed, or more than, the camera.

The dark slide, either single or double, is, of course, an absolute necessity in some form or other, and, where only one or two plates have to be exposed, or where a dark room is available for changing, it is undoubtedly the best means. But for out-door purposes generally, and especially when travelling, the inconvenience of a large number of separate slides is felt, and we may go back to the very earliest days of photography upon glass before we find the first attempt, in the form of a "changing box," to dispense with them. Previous to the changing box, however, in the old wax-paper days, the sheets of sensitive paper were frequently carried in a single slide, pressed against a piece of plate glass, a changing arrangement, usually in the form of a bag, into which the slide and the operator's hands could be passed, enabling the front sheet to be removed to the back after each exposure.

This forms, perhaps, the *acme* of primitiveness in changing, and with more or less modification may form, as in fact it does, the principle upon which really useful methods may be based. In its earliest application to glass plates, a single dark slide and an ordinary light plate box were employed in conjunction with the changing bag; and, as we look back many years to the use of such an arrangement, we are not cognisant of any feeling of inconvenience in its application.

The first changing box proper, that is to say, one which enabled the changing to be done without the aid of the bag, consisted of a grooved plate box with a hinged flap lid sliding in guides. In the hinged portion, which folded flat against the side of the box when not in use, was a slot provided with projecting jaws, into which the dark slide could be fixed, the end of the slide so attached being also provided with a corresponding slot, which was closed by a sliding strip of hard wood or brass. In use the slide was connected with the jaws of the changing box, and the folding lid was then slid into position over any particular groove, a simple metal catch falling into notches retaining it in place, so that the two slots accurately coincided, and allowed the plates to be passed into or out of the box as desired.

This, when well made, proved a useful and efficient contrivance, but its simplicity placed it within the capacity of inferior workmen, with the result that it was too frequently found unsatisfactory, besides which the loose flap was a nuisance, and unless great care was observed the lid was liable to slide off altogether at unexpected times. The first improvement was made by Ottewill, who replaced the flap lid by a double one, sliding in two parallel grooves one beneath the other. The upper half of the lid carried the jaws, which were closed when not in use by the under lid, which was kept in position by a spring catch. When the latter was loosened, and the under lid drawn out to its fullest extent, the slot of the jaws was found to be open and in position for the first plate, the two portions of the lid being then firmly clamped in their new position, and capable of sliding together so as to bring the jaws over each groove in succession. An index and pointer at the side of the lid indicated the number of the plate with which the slide was in connexion, and a lever catch, worked by the thumb of the operator, ensured its stopping in exactly the right place. In many of Ottewill's changing slides the inconvenient sliding strip by which the slot was opened and closed was replaced by one which folded back into a recess in the woodwork of the slide upon turning a button or lever fixed outside.

The next great improvement was the automatic changing box of American origin, first introduced into this country about 1874 by Hare. In all previous changing boxes it had been necessary to close the lid of the box before detaching the dark slide, and this of course involved the necessity of going through the sliding operation twice for each plate, with the consequent chance of forgetting the number of the plate last exposed. In the automatic changing box, by an ingenious arrangement, the act of sliding the plateholder or "back" into the jaws causes the slot in the lid to open, the slide itself then preventing the access of light; similarly, when the slide is detached, the first movement causes the sliding plate to close the slot before the slide itself has commenced to uncover the outer opening, and so the working of the instrument, so far at least as the opening and closing are concerned, becomes automatic. The slide itself is opened and closed by means of a spring catch operating upon the back which is hinged, and on being released springs back a little from the plate, relieving the latter of pressure and opening the slot to allow it free passage.

The value of these improvements is found in the fact that, when a plate is withdrawn from the box, the sliding lid may be allowed to remain in position until the plate is returned, and thus no uncertainty need arise as to its going into the right groove. In fact, there is no necessity to close the box until the whole of its contents have been exposed, for from its construction it may be carried as easily, and with as little danger of accident, when fully open or when closed, this result being attained by utilising a flexible sliding lid working into the inside of the box instead of the hinged flap or double lids of previous changing boxes.

Such were up to comparatively recently the only principal methods of carrying plates for exposure in the field. The introduction of hand cameras has added a large number of more or less ingenious methods of storing and changing glass plates, while the advent of flexible films has still further augmented the list. Some at least of the newer systems could no doubt, with little modification, be adapted to other than hand-camera purposes if manufacturers and the more mechanically inclined among amateurs would lead the way. It is very certain that so far, at least, none of the existing methods of carrying and changing either plates or films has proved to possess such advantages as to place it clearly in front of the rest, and hence it is that we still have the choice of various specially designed storage reservoirs forming part of the camera, detached changing boxes and roll-holders, as well as the old favourite double slide.

The faults of the latter have been, as already stated, their bulk and costliness, in addition to the great care always requisite in order to avoid light leakage. As far as concerns the expense there is absolutely no remedy, since, owing to the extremely delicate workmanship, the cost of a slide of best quality to carry two plates is nearly as great as that of a changing box for six times the number; whereas, in the case of the latter, at a comparatively trifling addition to the original price, the box may be made to hold double or treble the number of plates or films. Of course, when glass is in question, the capacity of the changing box is in a measure limited by the weight of the contents, but with films this is not so, at least to the same extent; and a storage box for cut or rollable films may be easily made to carry fifty or sixty exposures without exceeding in bulk and weight the old changing box for a dozen plates and considerably under in those respects double slides.

The double slide too can, unfortunately, not be made much more compact or lighter than it has hitherto been, owing to the fact that the greater portion of its thickness, and consequently its bulk and weight, are devoted to the shutters, rather than to space occupied by the plates. If that space be reduced to the utmost limit or entirely ignored, it is scarcely possible to bring the thickness of the slide below half an inch, and then the cost, owing to the necessity for finer work, would in all probability be enhanced rather than lowered. The future outlook would therefore seem to be in the direction of changing boxes.

The objections formerly brought to bear against these were their liability to break down or "stick" at awkward times, and the great risk of accidents from forgetting the number of the plate in use, and the consequent running it into the wrong groove. We can only say, after an experience of thirty years with changing boxes of various kinds, that we have not had half a dozen accidents from the causes named, and, when they did occur they were directly due to carelessness. If the plates are of the proper size and thickness, as well as properly cut —and, what is of greater importance, if they are put through the changing operation before leaving home—all danger ceases from that direction, and if a memorandum be systematically made of each plate directly it is either removed from, or returned to, the box, not much of a loophole remains for forgetfulness.

But even the latter danger disappears entirely if the system of grooved boxes be dispensed with, as has been done successfully, and, in place of it, the plan adopted of a box with two openings, one for taking out the plate, the other for returning it after exposure. These two openings can be intelligibly marked, and, in addition, can be so arranged that it is only possible for the plate to pass *one way*; and, if in addition an arrangement be adopted for stopping the exit when the last plate has been exposed, it is difficult to see how any mistake can occur.

This is no fancy picture of an impossibility, but the actual principle of more than one changing box we have seen in use, some of which we may describe in detail on another occasion.

A SIMPLE METHOD OF PRODUCING ENAMELLED PRINTS.

Although there is, unquestionably, a growing taste amongst the public, the same as there is with the more artistic photographers, for matt and rough-surface-paper pictures, still there is a great demand for those with a highly glazed surface, and that too notwithstanding that they have so frequently, of late years, been decried as garish and only fit to adorn sweetmeat boxes and the like. This fact is evidenced by the large number of prints mounted in optical contact with glass "opalines" that are produced and which command such a ready sale, as well as the constant demand for enamelled portraits; also by the additional fact, that with the gelatino-chloride printing-out paper it is very general to squeegee the face of the print in contact with a glass or other polished surface, in order to still further enhance the gloss on the pictures.

Seeing that enamelled pictures are still being largely called for, and, judging by the present taste of no inconsiderable section of the public, are likely to be for some time to come, it is well to consider whether the present method of producing them is the best, namely, that by enamelling a silver print with gelatine and collodion? We think it may be conceded that it is not. The operations are troublesome, and occupy considerable time from the beginning to the finish, while, after all, but a more or less fugitive result is obtained. It has often been a surprise to us that a much less troublesome, and more expeditious, method of producing enamelled pictures has so long been neglected, particularly when it is considered that the results obtained are unquestionably permanent—a condition that cannot be claimed for any other process by which enamelled prints are made. We allude, of course, to the carbon process.

This process, now that ready-sensitised tissue is a regular article of commerce, is the simplest and at the same time the most expeditious system of making highly enamelled pictures. All that has to be done is to develop the exposed tissue on a collodionised glass plate, squeegee on the transfer paper, and allow to dry. When it is stripped off, there is the finished print, with all the highly glazed surface of a silver print enamelled with a film of collodion and gelatine in the usual way. Toning and long washing are dispensed with, and the pictures can be obtained in a great variety of colours, according to the tissue employed. Furthermore, by the system of developing on the yielding, yet, as it were, cementing film of collodion, the softer and more delicate half-tints are secured in greater perfection than in, perhaps, any other form of carbon work. Indeed, this particular system of working may be considered as a refinement of carbon printing.

As the carbon process is now so generally understood, it would be superfluous to say much on the subject; still, it may be well to give one or two practical hints on that phase of it now under consideration, because the plan of developing on a collodion film, to secure the highly enamelled surface, has not received a very large share of attention during the past few years. A glass plate is thoroughly cleaned, and then treated with French chalk in the customary manner. It is then coated with enamel collodion, such as that employed for silver prints. After the collodion is well set, the plate is immersed in cold water until the solvents are washed away. When the greasiness has disappeared, the film is ready to receive the exposed print, or prints—for each plate may be large enough to hold several. This is desirable when working on a commercial scale, as it takes no longer to develop half a dozen impressions than it does one. The exposed prints are soaked in water in the usual way, and then laid in position, face downward, on the wet collodion film. A piece of indiarubber cloth is then placed over the whole, and the squeegee applied, as in other methods of working. The plate is then placed between blotting-paper for a short time. The pictures are next developed with warm water and alumed. Indeed, these operations differ in no wise from the ordinary routine now so well known to every novice in carbon printing.

When using ordinary glass as a temporary support, a little difficulty may be experienced at first in judging of the development, as the picture, at this stage, is viewed by transmitted whereas, when finished, it will be seen by reflected, light. But with very little experience this difficulty will disappear. However, the effect in the finished result can always be judged with certainty by putting a piece of white paper behind the glass and looking at the image by reflected light. In place of plain glass, polished opal may be employed. This does away with the difficulty just alluded to; but the glass is more expensive, and possesses no advantage, after a little experience has been gained with the other. When the pictures have been alumed and rinsed, the plate may be allowed to dry, or the

transfer paper may be attached at once. When the latter is done, too much pressure should not be applied with the squeegee, as it might "squash" the image, which is still tender. If the prints require any spotting, they must be allowed to dry. The spotting is then done on the carbon film, with tube oil colours, thinned with rectified turpentine, which will dry in a very short time.

As soon as the transfer paper is attached the pictures become analogous to ordinary silver prints, after they are squeegeed on to the gelatined collodion, as regards the mounting and finishing, and this may be conducted in precisely the same manner to secure the highest gloss. With regard to the mounting, some prefer, after the back of the transfer paper has become surface-dry, to apply a second or even a third sheet of it. Then, when the pictures are stripped off, they may be trimmed and attached direct to the mounts, with glue applied at the edges, without fear of disturbing the brilliancy of the surface. If the prints show any tendency to leave the glass before they are perfectly dry, it is a good plan to put a few letter-clips round the edges of the plates to secure them. The best kind to use are those known as "bull-dog" clips, which may now be had with jaws six inches long. One of these on each edge will be sufficient even with large plates.

Non-photographic Latent Images.—It is now a long time since the question as to the "mechanical or chemical" nature of the latent image was considered worthy of discussion, though the older of our readers will remember many severe discussions on the subject; but at the Physical Society a little time ago another old, much-argued topic was revived in the shape of an account of a series of original investigations on "Breath Figures"—*i.e.*, visible images produced on glass when it was breathed upon after certain previous treatment. The paper was by Mr. W. B. Croft, and described his success in repeating results described by Professor Karsten, of Berlin, fifty years ago. The effects Mr. Croft obtained were as singular as interesting. Briefly stated, they consisted in placing a coin or coins on sheets of scrupulously cleaned glass, passing a powerful electric current through glass and coin, the whole previously covered with tin-foil, and observing how the glass acted when breathed upon. No change was visible under the microscope, but when either side is breathed upon a clear frosted picture of that side of the coin that faced it is seen upon the surface of the glass. Without any electricity, similar "breath figures" were produced when "stars and crosses of paper are placed for a few hours beneath a plate of glass." Writing on paper, done some hours before the experiment, will similarly reproduce itself, as also if an ivory style is passed with slight pressure. Later on in his paper he alludes to the well-known case, a glass, which has for some years lain over a framed picture, carefully protected from the entry of dust, showing a distinct representation of the picture below it. "Possibly," Mr. Croft says, "light and heat have loosened dust particles, and these have been drawn up to the glass by the electricity made in rubbing the outer side to clean it." These are a few of the leading points of the paper, the whole of which may be seen in *Nature*, December 22. But we would desire to point out what, as evidenced by the scant bibliography appended to the article, that after Moser (referred to therein) had published his investigations (they appeared in the *Journal of the Academy of Sciences of Paris* for July 18, 1842), wherein similar effects were described *in extenso*, and the claim advanced that they were due to the action of latent light stored in the impressing object, Mr. Robert Hunt took the subject up, and experimented largely. The effect of this experiment was to convince himself that Moser's theory was an erroneous one, for he obtained analogous effects when he used electricity in a manner very similar to Mr. Croft. But he did not content himself with breath figures; he deposited mercury on metallic plates, and so secured an absolutely permanent image. The multitude of experiments that this indefatigable experimenter made on this one subject alone are fraught with interest, and it is merely enough now to refer to them. They will be found described in the chapter on "Thermography," in the treatise on *Light*, by Robert Hunt, reprinted from the *Encyclopædia Metropolitana* (1853).

Arborescent Photographs.—Some of the most beautiful effects to be found in nature's handiwork are those so plentiful this present season, the arborescent forms of frozen moisture on window panes. Some exquisite photographs have been taken of them and utilised in various ways. On one occasion a Christmas card was made up by one of our readers with such a picture as a basis; on another a pattern designer was able to ornament a damask tablecloth by adopting its forms and so on. Lately, however, interest has been formed in yet another manifestation of the freezing of water. The pages of our contemporary, *Nature*, contain a number of letters showing how interesting and beautiful are the forms produced by frozen wind, whether the thick slush of the roadside puddle or the pinguid ooze that distinguishes the footpaths in a wet, dirty season. The photographer in search of novel effects may evidently with advantage find here fresh field for enterprise.

A New Mode of Silver Plating.—A new method of electro-depositing a silver alloy has been patented, and experimental plant to prove its value has been in action for some considerable time, and so favourable are the results considered that a Company is now being floated to work it. To photographers it possesses a double interest. It utilises the well-known metal cadmium, and it promises to supply a coating cheaper, harder, more durable, and less liable to tarnish than the usual electro-silver coating. We need only allude to the rollers and plates of photographic rolling presses to point out the value of such a method if all that is promised for it be fulfilled. Many photographers start using such presses, but we should like to know how many of them find it convenient to have the rollers and plates recoated when they are found in course of time to be worn away? The ordinary electrically deposited silver is so soft that a very little friction suffices to abrade and wear away a considerable thickness. A coating thick, strong, and little tarnishable will be a boon, and we should predict a great success for the "Arcas Plating Company."

Gum Arabic.—Mr. W. F. Howlett writes to *Nature* from Pahiatua, New Zealand: "Can you inform me what is now sold in England as gum arabic? I used to be able to buy a soluble gum: what I get now is the same in appearance, but it will not dissolve. It swells up, truly, but will not form a homogeneous filterable solution. It would be a great boon to small buyers if such things were sold under their proper names. Am I right in supposing that since the Soudan trouble gum arabic has disappeared from commerce?"

Captain Abney in America.—We understand that Captain W. de W. Abney, F.R.S., has been invited to represent the Royal Society on the occasion of the 150th anniversary of the American Philosophical Society in May 1893.

The Darkening of Silver Chloride.—In the December number of the *American Journal of Science* Mr. Carey Lea, in the course of some notes on silver chlorides states that fused silver chloride, poured into petroleum and placed in the sunlight without removing it from the liquid, is instantly darkened. From this it appears that the presence of oxygen or moisture is not essential to the darkening of silver chloride in light. The chlorine may be taken up by some other substance.

THE PHOTOGRAPHIC MIRAGE.

Mons. Gaston Tissandier treats, in a recent number of the *Paris Photographe*, of this singular photographic phenomenon, which he has studied for several years. The instances he gives of its occurrence are extremely curious, the first being supplied by M. Paul Roy, professor at the Lycée in Algiers. M. Roy stated that at an elevation of 250

metres, where there was a slight mist due to the heat of the sun (the time being 8 A.M.), he took a portrait of his son with the full aperture of the lens, giving a second's exposure. With a clear atmosphere, M. Roy said that this would have been far too much exposure, one-twentieth of a second sufficing. The lad was seated quite clear of any shadows, with uninterrupted light full upon him, the background being formed of dense trees and bushes. A slight current of air showed, by looking at the background of trees, that the mist was in motion. When M. Roy developed the plate he was extremely surprised to see his own portrait, in the attitude in which he was when making the exposure, behind the picture of his son, and having a somewhat silhouette-like appearance. Our esteemed contemporary reproduces the photograph. M. Roy further observes that the image of himself was not well defined, as of course he was not motionless at the time of the exposure, and he also states that he made other attempts to repeat the experiment, but without success.

In the foregoing case, the image of the operator, as M. Tissandier observes, is clearly visible. That gentleman compares the picture to a "spirit photograph," of the kind obtained by double exposure. Here, however, there is no suspicion of cheating, and hence he concludes that the image of the operator was reflected on to the thin curtain of mist behind the sitter. He also takes occasion to remark that it is well known that shadows are occasionally cast on fog, and surmises that, in this case, the shadow of M. Roy, though truly cast on the mist, was not visible to the naked eye, although sufficiently sensible as to impress a plate by the aid of a lens.

In a second case, M. Tissandier alludes to a photograph, taken by Mons. C. Le Corbeiller, of the statue of David, on the Place Michael-Angelo, at Florence, with the image of the statue and its pedestal showing in the clouds. The photograph was taken one afternoon at the end of April, after a violent rain-storm; the sky was cloudy, the picture had three seconds' exposure, and M. Le Corbeiller states that, at the moment of exposing, the cloud image was invisible to him. M. Tissandier considers that there is a strong analogy between the explanation attaching both to the latter and the former cases of mirage photographs; but he withholds any definite opinion as to the actual cause of the phenomenon, wisely hinting that it is well to be guarded against mere illusions—and defects in one's apparatus.

After referring to the case of the transparent figure shown in a view of the Himalayas, to which our contemporary, the *Journal of the Photographic Society of India*, recently devoted a large illustration—a phenomenon which gave some of our Indian friends considerable trouble to account for—M. Tissandier concludes by regarding a photograph by Dr. Bernard as offering a phenomenon analogous to the foregoing. This picture (which is reproduced) is that of an hotel, the windows of which are reflected on the ground in front of it. The windows, however, are not "turned round" as regards top and bottom, as should be the case in a direct reflection.

A photograph of a clock, with its own reflection "in space," was also sent to M. Tissandier, who hesitates to say whether this and the foregoing phenomena are caused by double impressions, or by mirage. He, however, seems inclined to regard the photographic mirage as playing a part in the production of such double images as the first one here cited. The above facts are as interesting as they are curious, and might be worth studying.

PHOTOGRAPHING STAINED-GLASS WINDOWS.

II.

In a previous article on this subject I referred to the coating of the back of the plates with asphaltum as a preventive of halation, and mentioned that in my practice I found it more convenient to remove same *after* development rather than previous to the plate being developed, thus avoiding the chance of fingering and soiling the plate in the dark room.

This backing being on the glass side of the plate, and not being removed previous to development, of course prevents an operator from being able to judge of the density of his plate during development by looking through the film against the light, as in ordinary practice with unbacked plates; but this need not in any way deter a worker from adopting this mode of developing, for the image can be seen sufficiently well by looking down on the plate as the development proceeds, and any one after a little experience will have no difficulty in being able to judge of the progress the plate is making in the way of density by the manner in which the image comes along, and can soon tell whether the exposure has been about right.

A very important point, doubtless, is the getting of satisfactory gradations and suitable densities in the negatives. Over-density is as fatal to success as too little, for with the former much delicate detail is apt to be buried. An intelligent worker, however, will be able to guard against errors in this respect once he has had a little experience in the use of isochromatic plates. In my practice I find a developer weak in pyro gives most harmonious results. The following is a good formula:—

First and foremost, use plenty of developing solution. This should never be stinted, and for, say, a twelve by ten plate at least twelve ounces ought to be used in a dish but very little larger than will hold the plate. I mix—

Cold water	12 ounces.
Sulphite of soda	2 „
Dry pyro	20 grains.

This is flooded over the plate, and while on the negative I place in the developing cup half an ounce each of saturated solutions of carbonate of soda and potash. The pyro solution is then replaced in the cup, and the whole reapplied. The image generally comes along in beautiful gradations, and when the shadows begin to veil over development should be stopped, the rest of the operations being conducted just as in ordinary cases, a solution of bromide being at hand if development rushes up too soon.

After the plates are fixed and well washed, the asphaltum is easily removed by scraping off with a blunt-edged knife.

A very important item when developing or using isochromatic plates in any form is the guarding of the plate from ruby or other light during development. I firmly believe one-half of the failures in the working of these admirable plates is due to want of proper precautions in this respect. After a good many trials I am inclined to think that the safest light to use is two thicknesses of deep orange with an intermediate sheet of deep green glass, but even with this the film should be shielded by a cardboard over the developing dish during development, and the progress watched at intervals. To a worker accustomed to taking liberties with ordinary plates, doubtless this at first will prove irksome, but the extra precautions are more than repaid by the marvellous results obtained.

I have said that for exposure sunlight, in most cases, is the best to employ. Nevertheless, circumstances will transpire in which it will be found, owing to the situation of the window being placed with a northern aspect, that it is impossible to take advantage of sunlight for making the exposure. The work in such cases must then be done with the best diffused light obtainable. Another troublesome circumstance often met with it when working by diffused light is the unequal illumination of the window from its close proximity to some building which intercepts the sky line. The result of this is seen in the top portion of the window being very much better lighted than the bottom. When this trouble is met with, the image should be carefully noted on the ground glass of the camera, and a thread line run across about the focal length of the lens in front of the camera just at the height where excessive illumination from the top of the window begins to fall off. This thread is fastened to some convenient supports on either side of the camera, and serves as a guide to an operator for shielding off the light by wafting up and down a piece of dark cardboard at intervals. By this means a more equal illumination of the plate is obtained.

The unveiling of stained-glass windows is generally a most interesting ceremony, and one that is not always performed by means of daylight. In cases where it is desired to bring together large audiences, such as a congregation, to witness the unveiling of, say, a memorial window in some sacred edifice, it sometimes happens that the congregation can only be got together as a body after business hours, or at nightfall; hence a system of unveiling by means of artificial light has come to be adopted, and, so far as the illumination of a window, for all practical purposes of inspection, for the time being, is concerned, the idea is a good one and works very well. The plan is to erect a platform at a convenient distance, facing the window, outside the building, so that a pair of powerful mixing jets can throw a disc of limelight over the window, the interior being darkened. An enthusiastic amateur friend of mine on a recent occasion was quite exuberant over the idea of being able to attend with his camera in the front of a gallery on this occasion, imagining he would succeed. I told him it would be useless, and so the result proved.

Perhaps of all the various colours met with in stained-glass windows an operator will be most puzzled to account for the varying behaviour of his plates to the effect of ruby colours, even in one and

he same window. I once met with a case where for a long time I could not understand how I failed to get equal results from the ruby portions of a window, the colours of which, so far as the eye could judge, seemed to be identically the same. This was most noticeable in a case where the centre figure, with its surrounding, was extended over the mullions into other windows alongside. The ruby in the centre panel came out well represented on development, but the side panels showed a distinct baldness when compared with the centre. On inquiry at the glass-stainer's, and showing a proof print from the negative obtained, I was met with a laugh, and informed that there were several kinds of ruby glass, and that doubtless the shading-off so admirably represented on the window was obtained by using a special sample of ruby-coloured glass specially prepared to obtain gradations of tints whereby a fine plastic effect is obtained. I was soon deeply interested in these different samples of ruby-coloured glass, and in a few minutes had three distinct samples placed before me the colouring of which it was almost impossible to detect any difference in. A close inspection, however, divulged the fact that they were entirely different. No. 1 was flashed ruby on yellow; No. 2, ruby on blue; No. 3, ruby on white; and these samples were not evenly flashed, it being very desirous at times to get variations, such as high lights on a drapery, by means of these thin portions; and in many instances where these graduated portions could not be worked in or utilised the practice of etching was adopted. I soon found out how I had been puzzled over the samples of ruby.

Blues, again, sometimes give curious results. In cases where the colours verge into a peacock tint, a good impression will be obtained without the use of any yellow screen; but in cases where the blues are of an ultramarine tint a yellow screen will be required. Different workers have their own particular fancy for using these yellow screens, some preferring them behind and some between the combination of the lenses; but I like best to employ a perfectly flat sheet of glass, one surface of which is flashed canary colour, up against the sensitive plate. Allowance must be made for this in focussing, but in practice sharp results are obtained quite easily with them.

Yellow screens, however, in my opinion, should be used with caution, for they often do more harm than good where a variety of colours is being dealt with.

T. N. ARMSTRONG.

ON SILVER HEMISULPHATE.*

ALL the specimens of this new substance contain a little phosphoric acid which cannot be removed. Reckoned as phosphoric anhydride it amounts to a little over two per cent. Three determinations gave respectively, 2·30; 2·09; 2·18, mean 2·19.

It is apparently united with silver, and this silver phosphate is united so firmly with the double sulphate that it cannot be detached. If it were not so united it would be dissolved in the nitric acid with which the substance is three times treated if it were normal phosphate, and if it were hemiphosphate it would be converted (if in a free state) to normal phosphate and dissolved.

Another attempt to remove this phosphate was made by heating the substance with sulphuric acid to 100° C. for ten hours, followed by copious treatment with boiling distilled water to wash out the sulphate which it was hoped would be formed at the expense of the phosphate. It seems difficult to believe that a silver phosphate could resist this treatment, but a quantitative determination showed that the proportion of phosphoric anhydride is not even diminished by it.

Other modes of formation than those described here were experimented on with the view of obtaining the substance free from phosphate, but without good result.

It is possible that the silver phosphate may be combined in definite proportions, and the approach to uniformity of composition somewhat favours this idea. But such a view would require the assumption of a large, perhaps too large, a molecule.

Analyses.

A. Material prepared from silver carbonate and dried at 100° C.

	(1)	(2)	Mean.
Ag	76·13	76·75	76·44
O	3·29		3·29
P_2O_5	2·30	2·09	2·19
SO_3	16·19	16·47	16·33
Water	1·78		1·78
	99·69		100·03

B. Material prepared by various other methods considered less reliable.

Determinations.

Ag per cent.	P_2O_5	SO_3	O
78·59			3·93
78·45			3·69
77·16			3·61
75·43	2·18	15·61	3·29
75·46			3·25
75·35	1·77		
Mean 76·74			Mean 3·55

The determinations of phosphoric and of sulphuric anhydride are placed opposite the silver determinations to which they belong. The oxygen determinations are distinct.

The most reasonable interpretation of these results is that we have to do with a double sulphate of silver hemioxide and protoxide in which a portion of sulphuric acid is replaced by phosphoric. The proportion of phosphoric acid seems to be nearly constant, three concordant analyses having given 2·09, 2·30, and 2·18, with a mean of 2·19. These proportions may be expressed by the formula:—

$$7(Ag_4SO_3Ag_2SO_3H_2O) + Ag_6PO_4Ag_3PO_4.$$

The comparison of this formula with results obtained is as follows:—

	Calculated.	Found (Mean).
Ag	76·78	76·44
SO_3	15·67	16·33
P_2O_5	1·98	2·19
O	3·80	3·29
H_2O	1·76	1·78
	100·00	100·03

This large molecule results from the relatively small proportion of P_2O_5, and although the figures obtained for phosphoric anhydride are very concordant, it perhaps is better to consider the substance as a double sulphate in which part of the sulphuric acid is liable to be substituted by phosphoric. If the silver phosphate is taken as adventitious, the formula becomes simply $Ag_2SO_4Ag_2SO_4H_2O$.

Decompositions.—The action of alkaline hydroxides is confirmatory of the above conclusions, and also offers further proof of the great stability of the substance.

When the double salt is placed in contact with excess of dilute sodium hydroxide it blackens, being converted into a mixture of the hemioxide which is intensely black, and the normal oxide. This decomposition, however, takes place much more slowly than with the salts of the protoxide, so that (unless heat has been applied), if after ten or fifteen minutes the alkali is poured off and the oxides are dissolved with dilute nitric or sulphuric acid, a considerable residue is found of the red-brown double salt which had escaped decomposition.

With continued treatment with sodium hydroxide (that obtained from metallic sodium was used as being absolutely free from chlorine), the decomposition is complete.

The oxide thus precipitated was thoroughly dried at 160°—170° C., weighed and ignited. Five determinations of oxygen from various specimens gave 4·73; 4·63, and again 4·24; 4·19; 4·17 per cent. of oxygen respectively. A salt with the constitution already described should yield one molecule each of hemioxide and of normal oxide, and this mixed oxide should contain 4·68 per cent. of oxygen. We have then:—

	Mean of 5 Determinations.	Calculated.
Oxygen per cent.	4·39	4·68

The double salt is more readily decomposed by hydrochloric and hydrobromic acid, or even by alkaline chlorides or bromides. Under their action it instantly blackens. That part of the silver that exists in the form of hemisulphate is converted into black hemichloride or hemibromide. The extreme instability of these hemihaloids causes them spontaneously to resolve themselves into metal and normal haloid. They rarely remain as hemihaloid for more than an hour or two, and often for much less time. The change is often quite sudden, and is easily observed by the alteration of colour, the black of the hemihaloid passing into the metallic gray colour belonging to a mixture of normal haloid with metallic silver. The hemibromide seems to be little less unstable than the hemichloride.

This instability does not render an analysis impossible, since both the products of the change are insoluble; but renders it somewhat more difficult, as the freshly-formed silver haloid tends to run through a filter. Sometimes, indeed, it seems as if traces of the silver chloride

* Concluded from page 823.

were for a few moments soluble in water with a yellow colouration. The appearance of this yellow colour in the water is apt to be the first indication of the splitting up of the hemichloride.

Two analyses were made, one of material obtained by acting on the brown salt with dilute hydrochloric acid; this contained 81·79 per cent. of the silver. One by decomposing it with sodium chloride; this gives 81·93 per cent. A substance having the formula already given should, by conversion into chloride, give a mixture in which two-thirds of the silver should exist as hemichloride, and one-third as normal chloride. We have then

	Found 1	Found 2	Mean.	Calculated.
Ag per cent. -	81·79	81·93	81·86	82·35

a result sufficient close to afford a confirmation of the constitution assigned.

When the brown salt is decomposed with dilute hydrobromic acid or an alkaline bromide, a corresponding result is obtained. By treatment with hydrobromic acid a mixed bromide resulted, which proved to contain 66·06 per cent. of silver.

A general consideration of all the reactions which I have obtained seems to indicate that the action of sulphuric acid and sodium hypophosphite on silver carbonate does not lead directly to the production of the double salt which I have described, but that the hemisalt is produced in excess, often in large excess; that the nitric acid oxidises this excess, being able to attack the *free* hemisalt, but not that portion which is combined with protosalt and so rendered stable. It follows that, whatever has been the original relative proportion between the two salts, the nitric treatment leaves always one molecule of each. If it were possible to control the formation, it is not improbable that a pure hemisulphate might be obtained. But the action of the hypophosphite tends so strongly to carry the reaction still further, that reduced silver appears, and in removing this with nitric acid the double salt results. A confirmation of this is found in the fact that the treatment with nitric acid much reduces the deep terra-cotta colour of the original product. If this difficulty can be overcome, we may yet obtain hemisalt isolated.

There is reason to suppose that numerous other compounds of silver hemioxide with oxyacids may exist. These compounds cannot be obtained by acting on the normal salts with sodium hypophosphite or with hypophosphorous acid, but it appears probable that they may be produced when the normal salts are formed in the presence of sodium hypophosphite. If to the last-named salt we add a solution of a salt capable of precipitating silver nitrate, and then further add silver nitrate, we obtain precipitates which, after standing some hours with frequent stirring, appear to contain compounds of silver hemioxide. But these products do not resist the action of nitric acid; consequently there appears to be no means of purifying them and of deciding with certainty as to their nature.

When sodium citrate and hypophosphite are dissolved together, and a little silver nitrate added to get rid of chlorides, then after standing and filtering more silver nitrate is added, a precipitate is obtained which, after a time, appears to contain silver hemicitrate in an impure form. When a little of this precipitate is put into much water containing a trace of ammonia (five or six drops to 100 c.c.), a fine rose-red solution results.

Most oxysalts of silver are darkened by light. In a paper published in this *Journal* for July, 1887, I mentioned that films of these salts exposed to light and then treated with dilute hydrochloric or hydrobromic acid appeared to be converted into hemichloride or hemibromide, and argued therefrom oxyacid hemisalts of silver must exist, and be formed by action of light on normal salts. I believe that I have been able to prove the existence of a hemisulphate with a strong probability that many other hemisalts may be formed both by the action of light and also by purely chemical means. It is possible that at some future time we may succeed in obtaining some of these compounds in a state of purity.

M. Carey Lea.

EXHIBITIONS AND JUDGES.

I have mentioned the Photographic Society of Great Britain as unquestionably the best Society to take up a question of this importance. Now, presuming that to the Photographic Society of Great Britain are already affiliated the following societies—Carlisle, Newcastle, Sunderland and Darlington, Liverpool and Manchester, Birmingham, Nottingham, Leicester, Derby, Northampton, Gloucester, Bristol and Cardiff, Ipswich, Norwich and Yarmouth, and Tunbridge Wells—we have the nucleus of a national photographic union. Each of these societies should hold an exhibition yearly, *private* or open. The open exhibitions might be arranged somewhat as follows:—

1893. London, Manchester, Newcastle, Norwich, Notts, Derby, Bristol, Northampton.

1894. London, Liverpool, Birmingham, Carlisle, Sunderland, Gloucester, Ipswich.

1895. London, Manchester, Newcastle, Yarmouth, Cardiff, Leicester, Darlington, and Tunbridge Wells.

1896. London, Liverpool and Birmingham, Norwich, Notts, Derby, Bristol, and Northampton.

This gives us an open exhibition every year in London, every *two* years at Manchester, Liverpool, Newcastle, and Birmingham; every three years at the remainder. The *dates* of these open shows to be fixed by the secretaries after consultation, but in such a manner as to avoid a plethora of exhibitions at one and the same time. Private shows to be in the hands of the individual societies, but open exhibitions to be under combined management. The profits, if any, to go to a central fund; any losses—and these should be anticipated—to be made good from the same source.

Medals of various values might be given in this way. A new picture may be shown, but no matter what its excellence it receives a first-grade medal; this enables it to compete at next showing with others of like standing it possibly here receives a second-grade medal, which entitles it to compete for a third-grade award, by which time the competition would be one of giants, and a fourth-grade National Union medal and diploma, difficult of achievement to the insatiable competitor, might be added a championship prize for the best picture of the year. The pictures of the fourth grade, or sufficiently good duplicates, to become the property of the National Photographic Union, and would go to make one of a series which would form the backbone (not for competition) of any local exhibition, where not previously exhibited, finally reaching its well-earned repose on the walls or in the portfolios at headquarters.

At first sight this might appear hard on the eminent photographer, that, in fact, just as in Association football certain leading clubs are exempt from the qualifying stages for the Association Cup, these eminent men should be allowed some licence. Be this how it may, we know for certain that some of these eminent men are very uneven workers and are not above showing pictures far below their capabilities.

With regard also to the question of one man sweeping the board, the rule should be that one medal only be given for one picture, but a certificate of entry to a higher class might be given for others shown. Then how should we deal with the "one-picture man?" Simply in the highest grades confining them to men who have achieved a certain number of successes.

Who is to do all this judging? This is a difficult problem indeed at first sight; but, when we look into it, it is clear that in the earliest stages the operation would be merely a "weeding out" of certain work, and that the competition proper would not begin until the higher stages were reached. Marks would have to be given each picture, and the process would necessitate some time and much pains. It is possible, of course, to do the judging economically, and in most exhibitions it might be advisable for a small local committee to undertake the work, but undoubtedly *one* Judge sent down from the headquarters to adjudicate and report would be likely to give most satisfaction. He would be able to report on the work individually and collectively.

With regard to such Judges, it may be asked, where are they to be found? But surely this can be answered. There are highly intelligent and well-informed members of the profession, successful in business, of high standing, liberal, sympathetic views, and able to express their opinions. Some are still in business, but probably are not so tied to the studio but they would be able and willing to adjudicate. A few, perhaps, have retired from active work, but with their interest in the welfare of photography unabated. These doubtless would be willing to take a journey north, south, east, or west. The work should not be done for nothing, and a fee (as liberal as possible) should be fixed and paid by the central authorities.

All classes, except lantern slides, might be abolished. There is a great variety in photographs, from the merely topographical to the studies, more or less perfect, representing some idea or story. Now, unquestionably the *genre* must take the palm, and it is probable that, measured by grades, specimens of this class only would live through the grades requisite to achieve the highest point of excellence. It is clear that a pure landscape or bit of architecture would need to be transcendently beautiful to achieve the like distinction, and, even with regard to the figure studies, how many numerous degrees of excellence there are! Of the large number of admirable studies, how few linger in one's memory as do Robinson's *Carolling* and Sawyer's *Moonlight* and *Twilight* pictures! I mention these merely out of

considerations of space, not that I forget others; but it is easy to see that our best exponents of photographic possibilities would always be found on the top rung of the ladder.

I throw out these brief suggestions in the hope that others will take up the subject. By judicious kicking on the part of some of our forward men, we may land the ball safely into goal. J. Pike.

SPECTACLES AND MAGNIFIERS FOR PHOTOGRAPHERS.

The interesting editorial article on "Magnifiers for Retouchers," opens up a subject not only of practical importance, but also of great moment to photographers, as regards the preservation of eyesight. The power of vision varies so much, not only individually, but also in each eye, and if there is a distinct variation in focus, refraction, or muscular accommodation, then each eye should be separately suited. I have, in the course of a long period of sight-testing, found some curious differences in the two eyes. One eye, for instance, being long-sighted, the other, short: while on several occasions I have found that all the work is being done by one eye, and the patients were not aware of the fact until I proved it to them. The optometers, constructed on Dr. Smee's principle, are invaluable for sight-testing, because with it, not only can the focus of each eye be found, but the amount of accommodation registered. It also detects errors of refraction, such as astigmatism, hypermatropia, or over-sightedness, and also weak sights, which have little or no muscular accommodation. A normal eye, having a certain range of vision on the scale, it is easy, with a properly constructed instrument, to interpose lenses in front of the patient while looking through the standard eye lens of same, in order to lengthen or shorten the focus of the eye, the required amount to correct the short or long-sightedness as the case may be.

Even with this perfect arrangement something more is required in cases of astigmatism, and Dr. Tweedy invented a simple arrangement for detecting the presence of it, and by means of a frame of lenses, all rotating by the turning of a key or head attached to a pinion moving a rack running the whole length of the frame, finding the necessary correction. These lenses, rotating in the cells, are cylindrical in form, and have the property of elongating the object looked at through them, the degree of elongation depending on the radius of the cylinder.

A great number of persons are affected by astigmatism, and often without knowing it; and from the fact of never having known what it was to see *properly* they had no idea of their deficiency. Now, how can we find out if we have normal or perfect sight? First of all we must try *each eye separately* on small type and figures such as one gets in *Bradshaw* or the *A B C Railway Guide*, holding the book ten to fourteen inches from the eye; then, by looking at fine lines radiating from a central point, see if each line is divided from the next, and looks equally black and sharp. The best distance to be noted for both eyes, and also the range of distinct vision, from the nearest to the farthest.

If a magnifying lens is at hand, use that on the fine lines, and, should astigmatism be present to an appreciable extent, it will be found that there will be a different focus required for vertical lines to that which is required for horizontal.

In my own case, I see horizontal lines, and those near the horizontal, sharply much nearer than I see the vertical and those near to it. In fact, with a lens six or seven inches in focus, on looking at a number of parallel lines, drawn about one-sixteenth of an inch apart, I see them sharply (when holding the magnifier at the same distance from the eye) at a difference of about three-eighths of an inch, the distance from paper to lens being three inches in one case (horizontal) and three and three-eighths in the other (vertical).

Nearly everybody has a master eye—that is, are either right-eyed or left-eyed. By this is meant that one eye is the active agent in defining and giving the best impression of sight, while the other acts by sympathy. If, for instance, I concentrate my two eyes on a definite object, with something intervening in the true line of sight of same, I shall find that, on closing the master eye, the object has moved considerably; but, if the passive eye is closed, the object remains in the same position in relation to the intervening object—say one's finger against a gaslight at a far distance. Now, with regard to near objects when using a magnifier. If one has so trained the eye most employed to ignore the impression from the other, they can naturally see the object magnified without distress, and keep the second eye open. This is constantly done by microscopists and astronomers when using the microscope or telescope, because it is easier to the sight to work in this way. There is, however, a limit beyond which one cannot do this in comfort, and it is particularly apparent when using magnifiers over two and a half inches diameter, although I find I can, with an effort, use one of three inches. If one makes an ink dot on the lens when in focus with print at a part near the centre, when a certain letter is covered with one eye open, it will be found a second ink mark will have to be made nearly an inch away in order to cover the same object. This represents the difference (or the angle) of convergence of the two eyes. If a lens of four inches diameter or over is employed, then, the focus being longer, the angle is more acute, and the eyes can properly converge to the object when looking through the lens.

I was interested to try the effect of two double convex lenses of eight inches focus used as a pair of spectacles, instead of the magnifier, as suggested by the editor, and in a frame where the centres could be altered at will. I found with the optical axis the same as one's eye-width that the confusion was considerable when in focus, and, in fact, the separation of the two impressions of the object considerable. Even at the narrowest it could not be made to give a single image in my own case without considerable muscular effort, so I can quite think that any one peculiar or weak-sighted, with little muscular accommodation or natural adjustment of the eyes, could not manage with deep lenses. I found after getting a focus and seeing the object sharply, the image of it, seen by one eye, would slowly travel along, and be separated from half to one inch from the other image. Magnifiers are very often made of too short a focus for the diameter, and consequently have considerable distortion. It is far better to use a lens of moderate power that does not disturb the true form than see the object large and indistinct or distorted. Try the lens on straight lines, or on a square that is just included in the field of the magnifier, and if the former are curved or the latter not rectangular, do not use it, but have a compound lens made of *two* lenses to give the focus required. There is no doubt that in many simple of every-day matters of optics a great deal of carelessness is at time shown, and consequently that precious organ of sight, "the eye," seriously affected. G. R. Baker.

THE JUDGES AT WORK.

Whenever a gathering of *cognoscenti* is commenced for the purpose of apportioning praise, two initial stumbling-blocks present themselves. In the first place, all the members are not sufficiently known to each other to act in concert with such instant and reasonably perfect precision as they should; and, secondly, it generally happens that none of them are very clear as to the exact conditions under which they are to distribute their awards.

I particularly want these two points fully recognised, because they lend additional support to those modifications in the regulations of judging hitherto followed at the Pall Mall Exhibition below suggested.

Before coming to this, I would say that the Judges, having been in good time appointed, should each be furnished with a printed schedule, clearly setting forth that which each one is called upon to criticise, and should also receive a suitably drawn-up form on which he can register his opinions.

And now we arrive at the chief alteration which seems to be called for, *i.e.*, that in the future the judging shall cease to be *consultive*, but shall instead be strictly *individual* and *isolated*.

The advantages of this change are manifold. To begin with, its adoption ensures there will no longer be any chance that medals are bestowed by means of a kind of "give-and-take" procedure, which, amiable enough in its intention, encourages the glorification of the personal preferences of individuals rather than giving due weight to the aggregate opinion of the whole Committee; nor would there continue to be any risk of the Judges indulging in the undignified but very human practice of "follow my leader."

In most assemblies, and particularly restricted ones, there is to be found one man palpably taller than the rest—one whose *obiter dictum* has almost the force of law, and is in itself powerful enough to prevent the formation of any independent judgment.

Even when no such master-mind is present his place is usually usurped by the man of self-assertion, who, probably, comparatively deficient in critical ability, nevertheless imposes his views upon his reluctant but pliable fellows. Besides the inherent objectionability of this, it is distinctly to be deprecated, because the Society does not intend that such a practice should obtain. If the Society is well satisfied that the judgment of one man shall prevail, let it nominate the Judge, and legalise the judgment; but, if it be of opinion that it is not well for the great and extending diversities of expression in photographic art to be at the mercy of one person, however distinguished, then must the consultive form of judging be for ever swept away.

Whatever the size or material of the chess-board, the pawns thereon move just the same, and each one of us may readily from his

own maybe humble and limited experiences in consultive judging opine what is likely to happen in even the most "high and mighty" gallery where this system prevails; and, although the nett result may not always be the indiscriminate launching of medals, we know from recent occurrences that even the opposite extreme can be considerably hurtful to the cause of photography, especially when the ruthless withholding of rewards breaks an implied promise or a prescriptive expectation.

In order that isolated judging may be feasible, it becomes necessary to employ what is known as the *mark system*.

Without stopping to elaborate a description of this, let me shortly indicate by an example how it might be used.

There are, say, two (or some larger number) of Judges, A and B, for "landscape photography," each of whom separately inspects all the pictures. A awards to each exhibit according to merit, marks up to ten (or any other fixed maximum found most convenient) for *artistic quality*. B, for purely *technical quality*, awards a like number (or, if so arranged, a larger or smaller proportion of marks).

I am perfectly aware that there are some theoretical objections to the mark system, and also a few puerile practical ones, but they are none of them insuperable if the code adopted be carefully considered. Anyhow, if some small inconveniences, or some fanciful shortcomings, remain, such are far outweighed by the fact that the air is cleared from suspicion, or corruption, or undue friendliness. It would be worth far more serious sacrifices than are likely to ensue if the result be to place the judging for all time far above reproach.

Yet another good thing would follow the independent system, and that is the discouragement of works which are grossly defective in technique or absolutely "void and empty of every drachm" of art. That this is not uncalled for I can personally testify. In past years photographers of undoubted capacity and position have taken very serious umbrage because Judges, no doubt swayed by their inherent love of the beautiful, have given medals for prints which, although boasting of limner-like attributes, were painfully noticeable for faulty or negligent technique. On the other hand, quite a number of productions which show great perfection in the latter respect have, in spite of their utter disregard of the cardinal canons of art, been singled out for distinction, to the exceeding scandal of those who claim for photographic pictures a near kinship with painting.

One wholesome corollary of the adoption of the mark system is that doing so involves a more precise classification of exhibits than is now the case. Although classification is at present discouraged, yet, nevertheless, a rudimentary kind of grouping together of exhibits is made, if only in the minds' eye of the Judges; for it is in practice found to be impossible to compare productions which are largely dissimilar in *motif* and handling, except that they are photographs, there is but little in common between, say, Stevens's flower pictures, Birt Acre's *Story of a Cloud*, and Burchett's *Love Letter:* and so with portraits *genre*, cattle studies, sea pieces, lantern slides, and the rest.

It is, after all, but a small step, but none the less important, to do officially what is at present accomplished in an ill-regulated and informal fashion; even if the mark system be not adopted, the before-mentioned change would be well as leading to more ease in judging; by imposing upon the exhibitor the task of notifying upon what ground his exhibit seeks for distinction, the Judges are saved much irksome and uncalled-for drudgery. Yet another benefit which should follow the mark system is that medals would be competitive awards, and not, as now, given without limit, and sometimes without stint.

On the chief wall of the last Exhibition were no less than four separate series of landscapes, all truly charming and finished renderings of our island scenery; either set is doubtlessly worthy of receiving a medal in the absence of the other three. But why a medal each all round? One set must surely have been better than the others; in which case, why should the inferior be bracketed with the superior? It is not my duty to indicate which of the before-mentioned quartette deserved to be placed *primus inter pares:* but, whatever the cost, it should have certainly been incumbent upon the Judges to do so. Of course, under the present regulations, perhaps it was not merely politic, but also right and proper, for so much munificence in the distribution of rewards; but, although a more thrifty course of action would have resulted in much poignant disappointment, it would also have induced great future striving, and much instant appreciation in the value of the Pall Mall medal.

In conclusion, be it said that not the least merit of the system I advocate is that the personalities of those forming the jury of experts are merged into columns of figures; and thus it becomes all but impossible to blame one's friend—or, for the matter of that, one's enemy—should some one else's *chef-d'œuvre* come out first on the list of honour. Such, added to what I have written in the two previous articles of this series, embody the main remedial measures which, in my opinion, it were well that the executive of the Photographic Society of Great Britain should adopt in order to maintain, or rather increase, the prestige which should belong to the chief photographic "fountain of honour."

The suggestions made are, of course, but rough-and-ready jottings of a few reforms most urgently called for; and, if adopted, no doubt certain further complimentary alterations of a minor character will be needful. Thus the attainment of an absolute as well as a relative merit will have to be provided for before a picture or other exhibit shall receive a medal, and other subsidiary details considered which offer no insurmountable difficulty. On the contrary, if the members of the parent Society approve the principle of the scheme I have lightly outlined, they may rest assured that the subordinate machinery can easily be so fashioned as to work smoothly and efficiently.

HECTOR MACLEAN, F.G.S.

HOW A FAMOUS ANIMAL PHOTOGRAPHER WORKS.

MR. CHARLES REID'S NEW STUDIO AT WISHAW.

A CORRESPONDENT writes: A few days ago I had much pleasure in paying a visit to the gentle, genial Mr. Charles Reid at Wishaw. The man you all know—at least, by reputation and his work—for Reid's artistic studies of animal life are known and appreciated as far and wide as photography is known. In his own field he stands unequalled, and his productions are admired by all. For many years I have enjoyed the pleasure of Mr. Reid's friendship, and have often felt that his extreme modesty tends to do an injustice to himself; he seems to dread placing himself in a prominent position, so that only by his works do you know him.

During this visit he explained to me how he first started photography, and also how he began to take his first "artist's study pictures."

Away back in 1864, in a small village beyond Aberdeen, Mr. Reid kept a post-office, so you may safely say he was a man of letters. At this place a friend came to visit him, and with him he brought along a quarter-plate camera and lens. For three or four weeks Mr. Reid and his friend went in for the making of positive pictures, producing many failures, but some successes. Mr. Reid got quite enamoured of the work, and great was his surprise when his friend, who saw how much he was taken with it, proposed to leave him the apparatus, which he did; and from that time he has been a full-fledged photographer, so that he may be numbered amongst the early workers. From the north he came to Wishaw, eighteen years ago. He began to take "artist study" pictures as soon as he got settled in Wishaw. In relating to me his early experiences, he said:—

"Amongst the very first study pictures I made I took them down to Mr. George Mason, Glasgow, to ask his advice, and to see what he thought of them, and to see whether he thought a trade could be done in them if the idea was carried out. The enthusiastic manner in which these first productions were received, and the encouragement given me by Mr. Mason as to there being a big future in it, was one of the principal causes that led me to prosecute this branch of my business which has proved so successful, and I always think of that meeting with Mr. Mason with great pleasure."

The first lens he used in the animal picture work was a 2D Dallmeyer, but he soon renounced this portrait combination for a 3D Dallmeyer. Mr. Reid for his purpose found it rather slow, and now he uses a Dallmeyer rapid rectilinear whole-plate. Seven-by-five pictures were what he first produced, but now he takes them up to whole-plate.

He uses a Newman's shutter. When he got it first he found that the travelling plate, that rises and falls in the diaphragm slot, vibrated so much when working that it was useless for his purpose. He, to obviate this defect, had two rings fitted round the lens with adjusting screws, so that they could be bound tight. These are fitted close up to the moving plate, and from these rings he has little brass supports standing up, so that by this means he gets the plate to travel quite smoothly and free from vibration.

His exposures vary from a fourth of a second up to two seconds; but, after all his varied experiences, he says that he inclines to stop down, and give longer exposures whenever such a thing is possible. Out of many exposures on a subject, he is well content if he gets one or two successful ones. For development he uses pyro and ammonia. He has tried most of all the round of "best developers" that flood the market, but he returns to his old love with more satisfaction and pleasure than ever after such trials. He brought me a tray filled with medals, but, as he usually takes medals wherever he shows, it would be superfluous to enumerate them.

He showed me some examples of his later work, which were very

charming. One of these was a lioness on the back of a pony, taken in the open in Bostock's menagerie. In the middle of the operation Mr. Reid was rather startled by the sitter jumping down from the pony's back and trying to escape, but the brute was recaptured and made to sit again. He must have had a lively time of it when taking that picture, but he was at least rewarded by obtaining a good one. I saw a very attractive study, fully exposed and quite sharp, of *Mary had a Little Lamb*. The Mary was a baby, and the lamb's wool was white as snow. I saw horses and foals photographed to perfection; cows in fields, and cooling waters; poultry; birds of every feather, from the woolly chick to the graceful swan.

The new studio just built by Mr. Reid is a stone edifice of an attractive nature, forming the corner of two streets. It is two stories high. The studio is on the upper floor. Before starting to construct it, Mr. Reid had visited many of the best recognised places, and from each adopted those parts that suited his ideas, and the success of the finished result shows what might be attained by one who goes about with open eyes in search of the best points for his purpose.

The studio has a ridge roof, with a north light. The ridge is two feet off the centre, thus giving a greater slope on the north side, the slope coming down to within six feet of the floor, making an incline of twelve feet. The side of the studio from the floor to the lower edge of the roof is only six feet, with three feet of glass in the upper part, the lower portion being fitted with shelving for plants and flowers, with a graceful drapery underneath, behind which run the hot-water pipes for heating the place. The studio is forty-three feet long by sixteen feet wide.

The fittings and decorations are quite up to date. The curtains on roof for arranging the light are made of an art muslin festooned, and produce a very pleasing effect, being of a pale cream colour, with a faint Japanese pattern showing all through them. There is also a set of green blinds, fitted with spring rollers, for the purpose of giving increased variety of light effects. At the further end of the studio from that at which he takes his usual sitters are two real windows, and these Mr. Reid has utilised into a new style of background. The walls have been decorated so as to bring in the windows as part of the picture, thus forming an effect by which "at home" pictures can be produced with easy arrangement, and little trouble to the operator.

The studio is furnished with the newest appliances. Notable amongst these are the new American background stand, so favourably noticed at the last Convention, and Morgan's new patent shaded background.

The dark room is twelve feet square. The light is arranged by two frames, one of ruby and the other of yellow glass, with a sliding door over the top for daylight. The coloured glass is situated eighteen inches within the plane of the daylight pane, Mr. Reid finding this arrangement ever so much more safe to work by than when the coloured glass is placed close to the source of light.

The show-room is decorated with considerable taste, the fireplace being finished in encoastic tile, with an overmantel of artistic design, the windows being all filled in with stained glass, with plain places arranged here and there in the design for the fitting in of transparencies executed in carbon, and some in silver from Mr. Reid's own negatives. The hall door is also finished after this same design. The furnishing of the dressing-rooms is carefully studied for the comfort of clients.

As can be well understood, the negatives in such a business are kept with great care and perfect order, so that, when any special subject is wanted from amongst the thousands in stock, it can be had and handled at once. The printing is all done under glass. The house in which it is done is a lean-to, with sloping roof of hammered corrugated glass, which gives considerable diffusion of light.

Mr. Reid also does a considerable part of his own training. There is a department set aside for that branch.

The portrait business is large and important, and, with the assistance of his two sons, the management is efficiently undertaken. Lantern transparencies are also a growing business with him. Many examples of this class of work, of a very high grade, we saw when there.

He makes all his transparencies by the wet-collodion process, which he prefers. He has tried every brand of dry plates, but has failed to get results to please him, the collodion being the only process that gives results to meet his desires. He develops with iron, and tones with gold. The quantity of gold is not of so much consequence, for if excessive they tone at once, and when weak they just take the longer time.

Mr. Reid is called much from home. Agricultural and horse shows of every description, all over England and Scotland, request his presence with his camera; and, in spite of refusing many, his time is pretty well taken up with those that he accepts, and from such sources he brings home quite a wealth of pictures.

We often hear artists sneer at the productions of the photographer. They do allow that from a photograph they may get a suggestion or two to fill in some part of their compositions; but, as a whole, they are valueless, and never could take the place of studies from nature. In contradicting these assertions, Mr. Reid was saying that the quantity of oil paintings produced from his subjects was many, and, as can be believed, annoyed him very much. He was going down Leith Walk a short time ago, when he saw two oil paintings in an art-store window, line for line from his photographs; and that was just one of many such cases.

A large publisher asked the liberty to reproduce one of his pictures in a book that he was publishing. The liberty was granted willingly, but what was Mr. Reid's astonishment to find in the book when he saw it instead of one six pictures, copied with just the slightest alterations to make them different. So broadcast is this piracy, that he has serious thoughts of registering all his negatives as he produces them, to protect himself for the future.

PINHOLE PHOTOGRAPHY IN JAPAN.

[Photographic Society of Japan.]

ATTENTION has been called many times to the quality of photographs that can be obtained in a darkened chamber, or camera, without special optical apparatus—simply by means of a small hole in a very thin plate.

Amateur photographers can make pictures, pretty large in size, of landscapes, and even of monuments, without being obliged to buy lenses costing from $10 to $300.

No doubt, to reproduce plans and engravings, it is necessary to use the famous lenses of Ross, Dallmeyer, Beck, Hermagis, Francais, Nadar, and others. But we wish to perceive, when we examine a photograph, the particular effect which is produced on a more or less near-sighted eye by its entire surroundings, when it looks at nature from a little distance. It seems to us that, suppressing the lens, and replacing it by a pinhole, gives more artistic results as far as regards monuments, or landscapes without moving figures.

"Nevertheless, far from us," says an English journal, "is the idea of crying down the photographic lens which has, in the last year, attained so great perfection; for in the greater number of cases these instruments are, and will remain, indispensable;" but leaving out the instantaneous photograph, which has such charm for the amateur, and the portrait, the speciality of the professional, let us confine our ambition to obtaining, in as artistic a manner as possible, either landscapes or copies of monuments, and of these latter there are certainly no lack in Japan.

M. Meheux says that the most suitable hole is round, and drilled in a plate of copper or sheet brass of $\frac{1}{20}$ millimetre in thickness; it is necessary that the borders show no burr, and are bevelled, forming a cone.

Captain Colson has remarked that, although the depth of focus is unlimited, the greatest sharpness of definition for each size of hole is found at a determined distance, and he has succeeded in finding the proper focal distances for different diameters of holes. He has thus found that

The best definition for a hole $\frac{1}{20}$ millimetre is at	11	centimetres.			
" " " $\frac{1}{10}$ " "	20	"			
" " " $\frac{3}{10}$ " "	30	"			
" " " $\frac{4}{10}$ " "	44	"			

It may be mentioned that the size of the object to be reproduced is proportional to the distance from the apparatus, and to the distance from the hole to the sensitive surface.

It follows from this rule that, after having taken, for example, one view of an entire cathedral with a focal length of twenty centimetres, say, with the $\frac{4}{10}$ millimetre diameter of hole, if we wish to have the details of the gateway without moving from our place, it is sufficient to lengthen the focus to forty-four centimetres and to use the $\frac{6}{10}$ millimetre hole.

We may further remark that the Stenope—the name given to the above-mentioned plates—easily includes an angle of 100 degrees, or even more, without at all deforming architectural lines, and without destroying the perspective, which is far from being the case with even the most perfect wide-angle lens.

The length of exposure presents much less difficulty than with lenses; except we expose enormously beyond the proper time, it is nearly impossible to over-expose; we can always obtain a good negative by developing intelligently.

Nevertheless, if one must have a general approximate rule, we may say, as a general proposition, that the time of exposure is at least twenty-five times longer with the $\frac{3}{10}$ mm. hole than with a lens focussed upon the same view, and provided with a medium diaphragm; fifty times longer with the $\frac{4}{10}$ mm. hole; 100 times longer with the $\frac{5}{10}$ mm. hole; 200 times

longer with the $\frac{1}{16}$ mm. hole; it being well understood that we use the focal lengths corresponding to these holes.

But we can modify these times of exposure without over-exposing the plate. On the whole, this depends very much on the plates, the developer, and the actinic power of the light. Experience will be the best guide for every class of picture. Just the same as in nature, the sun has here great influence on the clearness of the view, more than it has when using lenses.

To sum up the advantages of using the Stenope:—

(1) More artistic definition than with a lens.
(2) Unlimited depth of focus.
(3) Perfect perspective for lines in architecture.
(4) Mathematical exactness in the scale of plans.
(5) The angle of view can include as much as 170 degrees.

J. Favre Brandt.

HINTS ON THE USE OF MAGNESIUM.

Before the South London Photographic Society on December 19 (the President, Mr. F. W. Edwards, in the chair), Mr. John Burgess, F.C.S., intimated that there were one or two points of difficulty with regard to his new process of colour printing which he desired to clear up before describing the process before the Society, and therefore postponed his paper on the subject, and substituted for it, "Hints on the Use of Magnesium." He said there was a great charm about the use of that substance, as it enabled persons to take portraits of their friends at home with their usual surroundings, and they were in no way dependent upon the weather in carrying out their intentions. He had for many years used magnesium largely for copying purposes, and his method of burning it was very simple. Sufficient magnesium ribbon was taken to produce the required amount of illumination and cut into lengths—the greater the number, the less time it took to burn. The lengths were fastened together at one end with cotton, and the whole inserted in a glass tube. On the outside of the tube a cork or piece of wood was fitted for convenience of holding the same. A spirit lamp was then placed on the top of the back of the camera, and after the persons to be photographed were arranged, and the adjustments of the camera carried out, the lamp lighted. The glass tube was then taken, and one end placed close to the lighted lamp, while the lengths of magnesium were pushed forward from the opposite end by means of a taper or something of that kind into the flame, causing the magnesium to ignite and burn as it was pushed forward.

The lecturer exposed two plates to illustrate his process, which were afterwards developed and handed round for the members' inspection. Various methods of using magnesium powder were described, and for illuminating a large space the lecturer considered that was more useful than the ribbon, provided the powder was mixed with chlorate of potash. Some persons objected to the use of the latter by reason of its explosive character, but if two parts of castor sugar was added to one part of chlorate of potash, and afterwards mixed with the amount of magnesium to produce the required amount of light, on burning it would be found to consume quietly, and had the merit of being non-explosive.

This mixture should be burned in a tin saucer or other similar utensil. A simple method of igniting the above mixture was to take a small quantity of sulphuric acid on a glass rod, and allow it to drop on the powder, which would cause it to burst into flame. Magnesium produced the most actinic light known.

Its intensity was increased by consuming in oxygen gas. The fumes arising from the combustion could be absorbed by passing them through a solution of hydrate of soda.

MULTIPLE COATED OR MULTIPLE FILM PLATES.

[Abstract of a Communication to the West Kent Amateur Photographic Society.]

The Theory of Halation.

As to the cause of halation, the first person to lay down any law on this subject was Captain Abney, and the theory first advanced by him has stood the test of time, and come to be universally accepted as the primary cause of what is known as halation. The theory is briefly this—that the rays of light from the brightly lit portion of the picture penetrate the film which supports the sensitive salt, and passing through the glass plate are reflected from its hinder surface back on to the film, and a moment's thought will show that the thicker the sheet of glass the greater will be the aberration of the reflected image from the original, and consequently the greater its interference with it. Though many attempts have been made to overcome or to minimise this reflection, such as grinding one or both surfaces of the glass plate, or backing the plate with either a dead surface or one with the same refractive index as the glass, and of non-actinic colour, only the latter can be said to have been adopted, and neither to be satisfactory, for although the dead surface will absorb all the light rays which reach it, it obviously cannot affect those which are reflected from the back surface of the glass, and the only advantage that packing has over placing a sheet of black paper behind the plate is that by it optical contact is obtained.

Burton's Experiments.

Some ten years ago Mr. W. K. Burton made and gave to the photographic world the results of some experiments in which he placed below the sensitive film a non-actinic one of gelatine, containing chromate of silver, which could be fixed out with hypo, leaving a clear printing negative. This was found to be fairly efficient, but so awkward to work as to be impracticable for general use.

I believe that the experiment has been tried of coating a plate with a very rapid but poor emulsion, exposing in the usual way, and then coating the plate with a thick emulsion, which it was supposed would be affected sympathetically by the exposed portions of the under film, and yield on development a good image. Who made the experiment, and what the result was, I do not know and cannot say, but venture to think that the process would prove considerably more awkward to work than that of Mr. Burton.

Double Coating.

It having been found that very little light penetrated an ordinary coated gelatine film during a moderate exposure, it was thought that if the film were thickened the chances of halation would be very materially reduced. This theory proved substantially correct, but the thick film presented difficulties and disadvantages. There was the expense of making so thick a film rich, and if it were poor—*i.e.*, if the same amount of silver that would be contained by an ordinary film were spread over the greater thickness—then an insufficient number of particles of the sensitive salt (that is, only those near the surface) would be affected to give a good result. This difficulty, however, has been got over by Mr. Sandell, who hit on the plan of coating the plate twice—a process heretofore considered impossible—first with a slow emulsion and then with a rapid one, his contention being that while the shadows were properly exposed on the upper film, the high lights would solarise it, and, penetrating to the lower, correctly expose that, and if the exposure were then increased, the high lights would entirely reverse the top film, converting it into a positive, and the greater the over-exposure the denser the positive would become, counteracting in its effects the fuller exposure of the under film; meanwhile, if the shadows were not very dark, they would, as they lessened the pluck of the "embryo" image of the upper film, form an under-exposed, and therefore plucky, one on the lower, and the weaker the one became the stronger would become the other, and the two together form a good negative.

Thus, on a correctly exposed plate, with heavy contrasts in it (and it is for this kind of view that the Sandell plate is meant), there would be on the upper film shadows with the correct exposure and high lights solarised, and on the film beneath clear unaffected film below the correctly exposed shadows, and correctly exposed film below the solarised high lights; and, in the case of the "pseudo" over-exposed plate, the shadows would be rendered by a negative lacking in contrast above and one with violent contrasts beneath, and the high lights by a positive above and a dense negative beneath; the combination of the two images in each case giving as a result a properly balanced negative of more or less density according to the amount of exposure the plate has received. In all cases little or no light would go beyond the second layer of gelatine, and, therefore, none could be reflected from the back of the glass and cause halation.

Double Coated Plates in Practice.

This, then, being the theory of the Sandell plates—the only multiple film plates at present in the market—it now remains to be seen what they will do in practice, and I must be egotistical enough to commence with a description of my own experiments, but only because I am the best acquainted with *them*. They may be interesting to some here, because made by one who knew nothing, and consequently committed every possible error of exposure, *i.e.*, of giving too little, too much, and what proved more fatal than either—singular though it may sound—a mean between the two.

On starting for my holiday this summer I determined to take a dozen ordinary Sandells with me, just to see what I could do with them. As I only got the plates the very day I started North, I was unable to make a single test exposure before starting, so had only the verbal advice of our accomplished president, Mr. Pringle, to go upon, and this I completely misunderstood, with the result that I went away under the belief that the correct way to treat the plate was to grossly—*i.e.*, many times—over-expose it, so as to reverse the top film, which was afterwards to be got rid of by stripping. As a result of the misunderstanding I managed to secure nine good negatives out of my dozen plates, and might have had ten, but for losing one through stripping when I ought to have reduced. This, it must be admitted, speaks very well for the plates. As a basis for my exposure I took what I considered a full exposure for a Thomas thickly coated landscape plate, and multiplied that by ten to make sure of over-exposing.

The first view I took was from a hill-path looking back over the town below towards the mist-covered hills beyond; a bright morning sun shining over my shoulder was clearing the mist from the mountain peaks of the Trossachs, and the whole landscape was yet hazy. I considered that a T.C.L. would have stood half a second at *f*-16, so I gave five seconds. On development the upper film darkened all over at once, and development was continued for about three-quarters of an hour, when the image was distinctly and evenly visible on the back of the plate. I fixed, and then stripped the top film off, and found a fully exposed negative on

the lower. The second plate, which was an identically similar, though not the same view, but with only 7½ sec. at *f*-22, I treated likewise, but found the image on the lower film too under-exposed to be any good, but the plate would probably have been saved had I reduced instead of stripping. As there were no great contrasts in either of these views, they were merely a test for length of exposure, and as such I will refer to them later on. As another test for length of exposure, I exposed two plates, a "Cyclist" and a Sandell, on the same subject—a group of old tombstones lying flat—under precisely the same conditions, giving the latter as many minutes as the former seconds—in each case one half, or a comparative ratio of 60 to 1. Between the two results you will see there is little to choose; the Sandell is the denser of the two, has more detail in the shadows, but is somewhat stained with the reducer. Three other views had dark foregrounds, a mountain distance, and clouds; in one the sun was in front of the camera, and shining between fir trees on either side of the picture, throwing their trunks into deep shadow; between them was a distant mountain peak, Ben Vhorlich, some eight miles off, and brightly lit clouds—in each case the clouds print well, and in this one the detail in the trunks of the fir-trees is not lost. This, I think, shows the plates' capacity for rendering contrasts.

Two other views of the same kind I unfortunately lost through giving an exposure too much for the upper film, yet insufficient to penetrate it—which seems the only thing fatal to a Sandell. Yet I believe that, had development been either proceeded with more cautiously or carried further, say, after stripping off the upper film, a printable negative might have been obtained.

Still, two others, which I exposed in a deep glen—one in which I believe a camera had never been before—with exposures that I considered sufficient to penetrate to the lower film, gave fully exposed, but good, images on the upper, which did not require reduction. All the plates were developed with Thomas's new developer, "Cyclol," which, I am told, is a mixture of hydroquinone and eikonogen, and, with the exception of the two I lost and the two mentioned as taken in the glen, development was pushed till the image appeared well marked on the back, and reduced to the required density with ferricyanide of potassium and hypo.

"Expose for the Shadows."

The old wet-collodion rule of "expose for the shadows, and let the high lights take care of themselves," seems to apply well—give the exposure that you think would best render the shadows on a plate of moderate rapidity; the high lights will then accommodate themselves somewhere in the "substrata," the great point to bear in mind being that if more exposure be given than the shadows will stand on the top film, then a *great deal* more must be given or the plate will be lost, by which is meant that, if x represent the correct exposure, then $2x$ or $3x$ will mean a flat and what would ordinarily be termed a hopelessly over-exposed plate, but if $50x$ to $100x$ be given, then there is every chance of securing a good image if development only be carried far enough.

The question will doubtless be asked, how is it possible to tell which films have been affected by the exposure, and by what symptoms can development be regulated? This is not so difficult a matter as would at first appear. As with all other plates it is best to commence cautiously, and with a developing solution of moderate strength; if the shadows remain fairly clear it is safe to conclude that the plate has not been over-exposed, and development should be carried on the same as with an ordinary plate, judging of the density by the appearance of the surface of the film, and by transmitted light, for nothing will show on the back of the plate except perhaps some very brightly lit portion—which should do so. If, however, the top film completely fogs over, the plate has been over-exposed, and development must then be continued for about half an hour, or until the image shows plainly on the back of the plate; by transmitted light it will then appear perfectly opaque.

The plate is then, in either case, fixed in the usual manner, care being taken that it is thoroughly fixed. The correctly exposed plate now presents the appearance of an ordinary negative, but the other is still opaque, and must be reduced, or if before fixing the image appeared evenly all over the back of the plate, the upper film may be stripped off—that is, if the operator feels competent to do so successfully—for it will have received such an excess of exposure as to yield a complete negative on the lower film, and render the top one superfluous. But stripping is risky work, and its only advantage is that it obviates the danger of reduction stains.

"The Scale of Densities."

A prominent theorist, Mr. Lyonel Clark, has suggested that a possible failing in the plate's action would be a break in the scale of densities, by which is meant that the upper film might be of the rapidity to correctly render the shadows and the lower the high lights, but the half-tones would act on both films and produce an area of undue density; this, however, is only a theoretical failing, for, as a matter of fact, half-tones are rendered with great beauty. Mr. Lyonel Clark further suggested that, to overcome this failing, a plate might be coated with a succession of films, each more rapid than the one below it, but this would, on the face of it, be useless, for no light would reach the lower films at all.

At a recent meeting of the Camera Club, Captain Abney described a modification of the Sandell plate to be used for spectrum photography, in which the upper film is isochromatic; the action, however, remaining to all intents and purposes unaltered.

The blue or chemical rays solarise the upper film, and are rendered by the lower, while the red rays act on the isochromatic film only, leaving the other untouched.

The scale rendering of plates thus coated is said by Captain Abney to be exceedingly good, and if by multiple coating a plate can be produced that will render by one exposure all the different colour grades of the solar spectrum in their due gradation of tone, and not only those which are visible, but also the ultra-violet and ultra-red rays which are quite invisible to the eye, it must be admitted that the multiple film plate is a step in the right direction, and that by its invention Mr. Sandell has added one more stepping-stone to those by which we photographers hope to cross the flood of difficulties that flows between us and the certain production of an ideal negative.

Gregor Grant.

PROGRESS IN PHOTOGRAPHY—A CRITICAL INQUIRY.

[Glasgow Photographic Association.]

In connexion with the late Exhibition of the Photographic Society of Great Britain it is announced that "the Council have determined to endeavour to obtain yearly such a selection from the pictures of the exhibition as shall show the progress of the art from year to year." This resolution opens up a very interesting question, viz., Is there a regular progressive movement in photography? Is the general work shown in exhibitions now better than that exhibited one, two, or three decades ago, and if so, in what direction is the improvement manifested? Is it the general mass of the work which is supposed to have reached a higher level, or can it be shown that the best results of to-day are superior to the finest photographic pictures of ten, twenty, or thirty years ago? The resolution I have read certainly infers that there is a continual progression, and in the pride of our time and of our own work we are apt to endorse the opinion without giving it much consideration. I propose in this paper to discuss the question in as fair a spirit as possible and see where it leads us. It will be necessary for this purpose to define photography, for it is a very wide term, and spreads its ever-widening wings over a vast number of operations and variety of results. It is often called an art-science, and, in a sense, correctly so, but we require a much fuller definition. There is an art photography and a science photography. These are closely associated with each other, and without the one we could never have had the other; but they are separate arts, of different natures, and must not be confounded. This distinction is not sufficiently appreciated. Any one conducting photographic operations is termed a photographer, and to the lay mind a photographer is as distinct a genus as a baker or a bricklayer, only varying in comparative ability. It will be found, however, that science and art will not mix readily, and we need not be surprised at this when we consider how vastly different are the essential principles which govern each. From the beginning of our civilisation science generally has been unmistakably progressive, and it is natural that it should be so. Nature is governed by exact forces which act and react upon each other by certain definite laws, and these are gradually being evolved by our scientific thinkers. Certain effects are remarked and noted, until by combined observation they are accepted as absolute facts. In course of time further experiments are made and fresh discoveries result.

Chemistry and Optics.

As in science generally so in photographic chemistry and optics; the original discoveries of Baptista Porta have been expanded and comprehended until now lenses of wonderful precision may be obtained for every department of photographic work. In the same way Sir Humphrey Davy's experiments on the action of light on various chemicals have been so fully developed that there is now an indefinite and ever-increasing number of methods by which the image gathered by the lens may be held and reproduced. No one will deny that there is progress in the direction of scientific photography, and there are many departments of photographic work which do not make any pretension beyond that of being scientifically useful. In this sense alone photography has been of inestimable service to the astronomer, the naturalist, and the engineer, and year by year these scientific workers are finding the means at their command more complete and useful. However, only a very small percentage of the specimens shown at exhibitions belong to any of these scientific classes, but are shown as pictures possessing more or less merit as works of art. Has the progress in this direction been as steady as in the purely scientific?

"The Late Exhibition."

Glancing over the various critiques of the late Exhibition of the Society of Great Britain, it will be noted that the *Daily Chronicle* says of the collection "that it is of greater merit than that of any previous year." The *Daily News* considers that "the level of artistic attainment

is well maintained." The *Morning Advertiser* says "there is a general improvement to be noticed in the majority of the pictures;" while the *Standard*, which prefaces its remarks by the statement that those who practise photography are usually artists, maintains "that the work is of a higher standard than that of any previous year." The *Times*, however, considers "it difficult to award to the Exhibition unqualified praise," and the *St. James's Gazette* is very severe in its criticism indeed.

The Capacity of Art and Artistic Feeling.

Not having seen the Exhibition, I have no intention of discussing its merits or demerits, but simply wish to bring the fact forcibly before you that there is a difference of opinion on the matter. Meanwhile, let us examine the nature and capacity of art or artistic feeling, and note wherein it differs from that of science. The latter we have seen to be progressive and accumulative, one generation continuing the work of their fathers, adding, as it were, fresh pages to the book of knowledge. In art, let it be pictorial, poetical, or musical, we find quite a different state of matters. Men are born with a certain capacity for appreciating that which is beautiful in form and colour, and natures which have this faculty strongly developed have from time immemorial experienced a desire to reproduce, in some way, that which in form or colour has fascinated them. These reproductions may be to others absolutely unintelligible, but are perfectly understood by natures of similar disposition or temperament of their own time and all subsequent periods. Stones may be cut with more ease now than they were 2000 years ago, but the forms expressed then were appreciated and enjoyed from the same standpoint by those who produced them as they are by ourselves to-day. It is possible that, owing to the spread of culture, there is a greater proportion of the people of to-day capable of appreciating their worth and enjoying their beauties—although this is problematical—but in any case the pleasure derived is precisely the same. And, with all our more favourable circumstances, the best products of these times cannot be excelled, rarely rivalled, in our own highly civilised and cultured nineteenth century. So, in painting, the artist has no longer to grind his own colours or prepare his own canvases or brushes; he has probably better materials; but with all the best examples of the centuries before him to study, he can hardly even hope to rival the work of the giants of his profession in past times. He cannot, like the scientist, begin where they left off, but must begin on precisely the same level. He must learn from the same open book of nature from which they learned, and his work can only reach the level of his own mental capacity.

"Ancient Art Unsurpassable."

The decorative art, of what we are pleased to term our rude Celtic forefathers, produced in the second, third, and fourth centuries of this era, and exemplified in the Ionic crosses and the brooches, sword-hilts, &c., which are to be seen in our museums, are still a wonder to us, and cannot be surpassed either for their purity of art or delicacy of workmanship by our artists of to-day. And so on—I might continue to multiply instances, Homer still stands alone and few men dream of eclipsing Shakespeare. But while thus endeavouring to show that a man must possess the greatest innate artistic instinct to produce the grandest artistic work, I do not wish you for a moment to think that I depreciate study and effort.

The most powerful faculties must be trained, and can only be fully developed by studying closely the best work that has gone before, and by earnest and constant application; but what I say is this, that a man can only appreciate or produce artistic work to the extent of his own trained artistic instinct. In photographic art the same reasoning holds good. The development of processes may give the exponent of the art fuller and more varied means of expression, but unless he feels some beauty to express no amount of scientific training or knowledge will enable him to make a work of art.

"Photography Revolutionised in the Last Ten Years."

During the last decade photography has been almost revolutionised by the introduction of the extremely sensitive gelatine dry plate. The effect of this has been twofold. It has attracted thousands of—may I call them—workers? who fancy that by purchasing an outfit, pulling a string and pressing a button, and carrying through several simple chemical operations, they will become photographers and produce pictures. They had no intention of taking any great trouble with the matter, nor do they, but in a careless hap-hazard style they produce multitudes of prints which they show to their friends, with the apology that they are only amateurs, and have not much time to spare, &c. The ease with which vast quantities of this careless work can be turned out has doubtless done much to degrade photography, and especially snap-shot photography, in the eyes of the public, but on the other hand the introduction of these extremely sensitive dry plates has put a new and as yet a comparatively unknown power in the possession of capable men, especially in landscape work. I say especially in landscape work because there are examples of portraiture done many years ago by the older processes which have never been surpassed. In the wet collodion process and in the still older calotype process, which required an exposure of several minutes in strong sunlight, there was sufficient resource to enable exceptionally clever men to produce portraits which for surface likeness and portrayal of character might almost be pronounced perfect. The strong lighting of the direct sunshine seems to show more of the real man than the softly-lighted portrait of his skin which is now so much in favour. I believe it is quite possible in photography to produce the ideal portrait which Tennyson so beautifully describes:—

> "As when a painter, poring on a face,
> Divinely thro' all hindrance finds the man
> Behind it, and so paints him that his face,
> The shape and colour of a mind and life,
> Lives for his children, ever at its best
> And fullest."

In some respects it is a pity that the old calotype method has gone entirely out of use, for it certainly possessed some qualities which belong to no other process. By its means it was possible to obtain a strength and breadth in the shadows, combined with an exquisite softness in the semitones and high-lights, which cannot be equalled, so far as I know, by any of the processes in use to-day. The process certainly had some strong points, and these were fully taken advantage of by a fellow-countryman of ours—D. O. Hill, R.S.A.—who, during the years 1843 to 1845, produced a series of hundreds of portraits, which artists, from Sir Frederick Leighton downwards, declare to be among the finest specimens of photographic work. I have here two volumes of these portraits, which I am proud to possess, and which have been shown to you before; but, as I can look over them with fresh pleasure and benefit every week, I make no apology for showing them to you again. These portraits bear the true stamp of the power of the worker, that of his own individuality. As experts can certify the unsigned works of the masters of painting, so these can be recognised as the product of one mind.

This is only one example. We have had other great portrait photographers, whose comparative merits it is not now my object to discuss. Mrs. Cameron, for instance, of whose portraits of Tennyson we are at present hearing a great deal, and who lived and worked in the days of wet collodion, did splendid work, which also bears her own personal imprint stamped in the picture, whether it be on the mount or not.

"Method."

The method is a comparative trifle to the artist; so long as it is capable of adequately expressing his feeling, he is content. But while these slower methods were sufficient for the capable portraitist to express himself more or less fully, the more rapid process has enabled the landscape photographer to work in a manner which was before impossible.

The poetry of the swaying reed, the rippling water, and the rolling cloud, is no longer beyond his effort, while in the snapping of a hand camera at a moving figure there may be more scope for artistic composition than in the most careful posing, and the possibility of obtaining a perfect result is certainly much greater. The simplicity of the working of modern methods has, as I have already said, attracted an enormous number of disciples, with this good result, that, among the multitude whose work is beneath consideration, there is bound to be a certain proportion of highly capable men, who, but for the simplicity of the manipulation, would never have touched photography at all, and, if the general work shown in our exhibitions is improving, I attribute it partly to the fact that a greater number of capable men are taking part in them, men of artistic feeling and training.

Indeed, the manipulation has now become so simple—thanks to the scientific workers—that, with a few lessons and several weeks' experience, there is no reason why any one, with an artistic knowledge and an adaptive disposition, need not make as perfect pictures as a photographer of many years' standing.

I have seen work done, within four works of the purchase of a camera, by a gentleman who before then knew absolutely nothing of the manipulation of photography, which would stand in the front rank of any of our exhibitions, and his success did not greatly surprise me. For twenty years it had been his delight and his profession to study form and composition, and to express them in other forms of art work. The technical manipulation is nothing compared with the knowledge of what goes to make a picture. The true artist will make use of the methods which the scientist has prepared for him, utterly indifferent as to the action of the chemicals; he will use the materials which serve most fully to express his feeling. Art has been defined as "Nature seen through a tem-

perament," and I think there is a great deal of truth in the definition. It is a truth which is very often forgotten, or not sufficiently understood, by scientific minds. The eye to them is simply a lens, the retina an exact and precise mirror. They make no allowance for the quality and temperament of the brain behind the retina. The impression the artist endeavours to reproduce is that which his brain sees on the retina, or so much of it as is of interest to him, and it is this selection of his work which stamps it as his own, and makes it different from that of another. If two artists of equal capacity happen to be attracted by the same piece of landscape, and from exactly the same point make a drawing of it, the results, while of equal merit, will be perfectly different. So it ought to be, to a certain extent, with photographers who study to reproduce their own individual expression. What I mean is very well expressed in the sonnet which appeared on the title-page of the *Germ*, the organ of the Pre-Raphaelite Brotherhood :—

> "When whose merely hath a little thought
> Will plainly think the thought that is in him—
> Not imagining another's bright or dim,
> Not mangling with new words what others taught:
> When whose speaks, from having either sought
> Or only found—will speak, not just to skim
> A shallow surface with words made and trim,
> But in that very speech the matter brought.
> Be not too keen to cry, 'So this is all!
> A thing I might myself have thought as well,
> But would not say it, for it was not worth!'
> But ask, 'Is this truth?' for 'tis still to tell
> That, be the theme a point or the whole earth,
> Truth is a circle perfect, great or small."

Even in the copying of paintings it is possible for the personal element of the reproducer to appear in his work. I shall quote from an article by Mr. Horace Townsend, on the exhibition of Mr. Hollyer's work at the Dudley Gallery, which seems to me to have been written with considerable insight and judgment.

In addition to the speed and simplicity of the gelatine dry plates, there is another quality which has enabled landscape photography to progress, and that is the more correct rendering of tone in small detached portions of light. In collodion plates every little spot of lighter shade had a tendency to become a sparkling white, and the effect destroyed all feeling of atmosphere and breadth which the picture might otherwise have possessed. Thanks to the gelatine plate, therefore, I consider that artistic landscape photography has progressed much during the last decade, and that the results produced by the best workers of to-day are superior to those of twenty years ago.

I have not taken into account the printing processes in this review of the progress of photography because, while there have been quite a number of delightful methods recently discovered, there has been from comparatively early times a variety of processes suitable for artistic expression, and while there is now a greater number to choose from they have not to any extent extended the possibility of artistic work. But for the lack of permanency of the plain paper silver printing, nothing could be finer, while carbon printing, which must now be considered an old process, is capable of such a variety of treatment that almost any result whatever may be produced by it.

The great matter, as I have already said, is to know how to use the methods when we have them.

Few men attain distinction in more than one department of work, and it will be generally admitted that the scientific capacity and the artistic temperament are seldom found in the same individual to any extent. One scientific man of considerable eminence is reported to have said that photography would be a delightful pursuit if it were not for the pictures, and I have heard several camerists say a fervid Amen to the opinion. They are wise men who can analyse themselves to this extent; they would be paragons if they took it to heart and refrained from sending their pictorial results to exhibitions. Their sphere of work, a most important one, is to perfect the materials, that others need not trouble themselves about the matter.

It seems evident, then, that for a photographer whose aim is to make pictures, the training should be artistic, not chemical. Let him study the works of the accepted masters in regard to tone and composition, balance of light and shade, and execution. Let him study to discover wherein lies the beauty of these pictures, and then he will see nature with fuller eyes, and it will be his aim to reproduce the new beauties disclosed to him, and not merely to obtain a permanent image of the reflection on a soulless mirror. "Faultily faultless, icily regular, splendidly null, dead perfection, no more." To sum up the result of this investigation I would say that the science of photography has been a constant progression, with the natural result that the increased facilities have enabled men of equ capacity to express themselves more fully, and thus to produce fin work. Scores of men now practise photography for every unit who d so a very few years ago, and there are, consequently, more good worke than formerly, and more good work to show; but the progress has be intermittent, and while the science of photography will continue steadi to progress in the future, the art will rise and fall as the men of mo than ordinary power and genius are born and die away.

J. Craig Annan.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
January 2	Camera Club	Charing Cross-road, W.C.
,, 2	Dundee Amateur	Asso. Studio, Nethergate, Dund
,, 2	Peterborough	Museum, Minster Precincts.
,, 2	Richmond	Greyhound Hotel, Richmond.
,, 2	South London	Hanover Hall, Hanover-park, S
,, 2	Stereoscopic Club	Brooklands Hotel, Brooklands.
,, 3	Birmingham Photo. Society	Club Room, Colonnade Hotel.
,, 3	Bolton Photo. Society	10, Rushton-street, Bolton.
,, 3	Brixton and Clapham	376, Coldharbour-lane, Brixton.
,, 3	Exeter	City Chambers, Gandy-st., Exet
,, 3	Hackney	206, Mare-street, Hackney.
,, 3	Herefordshire	Mansion House, Hereford.
,, 3	Keighley and District	Mechanics' Institute, North-str
,, 3	Lewes	Fitzroy Library, High-st., Lewe
,, 3	North London	Wellington Hall, Islington, N.
,, 3	Oxford Photo. Society	Society's Rooms, 136, High-stre
,, 3	Paisley	9, Gauze-street, Paisley.
,, 3	Rochester	Mathematical School, Rochester
,, 3	Rotherham	5, Frederick-street, Rotherham
,, 3	Sheffield Photo. Society	Masonic Hall, Surrey-street.
,, 3	York	Victoria Hall, Goodramgate, Yo
,, 4	Edinburgh Photo. Society	38, Castle-street, Edinburgh.
,, 4	Photographic Club	Anderton's Hotel, Fleet-street, E
,, 4	Southport	The Studio, 15, Cambridge-arca
,, 4	Southsea	3, King's-road, Southsea.
,, 4	Wallasey	Egremont Institute, Egremont.
,, 5	Birmingham Photo. Soc. (An.)	Club Room, Colonnade Hotel.
,, 5	Camera Club	Charing Cross-road, W.C.
,, 5	Dundee and East of Scotland	Lamb's Hotel, Dundee.
,, 5	Glasgow Photo. Association	Phileso. Soc. Rooms, 207, Bath-
,, 5	Glossop Dale	
,, 5	Hull	71, Prospect-street, Hull.
,, 5	Leeds Photo. Society	Mechanics' Institute, Leeds.
,, 5	London and Provincial	Champion Hotel, 15, Aldersgate
,, 5	Oldham	The Lyceum, Union-st., Oldham
,, 5	Tunbridge Wells (Annual)	Mechanics' Inst., Tunbridge We
,, 6	Brighton and Sussex	
,, 6	Cardiff	
,, 6	Croydon Microscopical	Public Hall, George-street, Croy
,, 6	Holborn	
,, 6	Leamington	Trinity Church Room, Merton-
,, 6	Maidstone	"The Palace," Maidstone.
,, 7	Hull	71, Prospect-street, Hull.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

December 22.—Mr. A. Mackie in the chair.

Mr. A. Cowan showed two transparencies he exposed in accordance with t Hurter & Driffield method of speed determination, one of them being twen two times faster than the other. The exposure was equalised by placing t frames at different distances from the illuminant, and the resulting ima showed as practically equal.

Mr. E. W. Parfitt showed several outdoor portrait studies, taken with t front combination of a cabinet portrait lens, the focus of the former be eighteen inches.

A discussion arose as to a statement that with some developers the ima during development, appeared at the back of the plate as a positive, and w others as a negative.

The Chairman remarked that he had always failed to reduce all the sil in a plate by any method of development.

Mr. P. Everitt thought it might be done with ferrous oxalate.

Mr. T. E. Freshwater showed photographs of the Himalayas, taken w both ordinary and isochromatic plates, sent him by a gentleman who c sidered that the latter plates did not give any advantage in the result photographs.

Messrs. Debenham and Bolas, however, pointed out that there was a decid superiority in the results as given by the isochromatic plates.

Mr. Peter Mawdsley was present at the meeting, and, in the course o few remarks as to the state of photography in America, said he thought th in regard to original research, American photographers were a long way behi the English. Americans were great believers in the virtues of develop formulæ.

Mr. P. Everitt, as the delegate of the Association on the Affiliation Co mitteee of the Photographic Society of Great Britain, gave details of t progress of the scheme, and gave it as his opinion that that scheme was wort of support, as he thought great benefits were likely to result from the propo "technical albums" which the Affiliation Committee were endeavouring establish.

The Association decided to join in the latter movement.

Hackney Photographic Society.—December 20, Mr. R. Beckett in the chair.—The Hon. Secretary made an appeal for voluntary financial assistance for Mr. Weir, a professional photographer, whose cause had been taken up by *Photography*, which was responded to. Some gummed labels (numbered) were shown and approved of, made by Vevers. The HON. SECRETARY announced that the Society had become affiliated to the Photographic Society of Great Britain. This was heartily received. Mr. W. L. Barker and Mr. Wire handed round work done on Paget print-out opals and plates respectively, fair results being obtained. Mr. Cross showed a negative which had black marks over it. The CHAIRMAN said these were due to metallic contamination which Mr. Cross thought was the case. Mr. Hudson showed a taper holder, marked in inches, which he used for burning magnesium ribbon. By this method he could mark off exactly the quantity of ribbon he wished to use. Mr. Paget (of Mr. C. A. Rudowsky's) then showed and explained the working of their electrical retouching apparatus. The vibration caused by the electricity made stippling over the film which facilitated the retouching. Owing to the absence of a proper negative the full value could not be estimated, but it will later on be tried. Mr. Paget showed a flash-lamp Mr. Rudowsky was bringing out, in which the powder was blown through upwards, and a continuous exposure of twelve seconds could, at will, be obtained. After this, negatives and transparencies on mica were passed round. They were not yet on the market—owing chiefly to their high price—but there was a great advantage, as, being so very thin, they could easily be printed from either side. In answer to a question, Mr. Paget said they would not chip.

Leeds Photographic Society.—December 12.—The following gentlemen were elected the officers of the Society for the ensuing year:—*President:* Mr. J. H. Walker.—*Vice-Presidents:* E. H. Jacob, M.A., M.D., and Mr. S. A. Wrigglesworth.—*Hon. Lanternist:* Mr. H. P. Atkinson.—*Hon. Librarian:* Mr. T. Butterworth.—*Hon. Treasurer:* Mr. T. W. Thornton.—*Hon. Secretaries:* Messrs. Herbert Denison and Robert Steele.—Mr. GODFREY BINGLEY introduced a discussion on *Film Photography*, first describing the composition of celluloid films, and the advantages on account of their lightness and small space occupied in comparison to glass plates, besides the advantage in not being liable to break; but the chief part of his remarks applied to the Eastman films and roll-holder used in the Kodak. His experience had been rather unfortunate, while he secured many good negatives. He also had some with electric markings, some with black bands, others with telegraph-wire-like markings across, scratchings, and tearing across, the causes for which he could not well explain. Mr. Smith, representative of the Eastman Company, was present, and, with his characteristic energy, combated some of the complaints, and showed negatives and prints from their films which were certainly very fine. While admitting failures at times, he stated that in all cases of defects the Co. made any compensated by supplying a fresh roll, which was corroborated by Mr. Bingley. Mr. Smith also stated that improvements were being made, and that films in 1893 would be as near perfection as possible.

Rochester Naturalists' Club (Photographic Section).—December 20, Mr. C. Bird in the chair. Mr. J. C. BOON gave a demonstration on the *Wet-Plate Process*. Mr. G. E. Randall offered to give a silver medal for the best print, to be taken by the members in the neighbourhood of Rochester.

Correspondence.

☞ *Correspondents should never write on both sides of the paper.*

THE NEW METHYLATED SPIRIT.

To the EDITOR.

SIR,—Seeing your remarks in the ALMANAC just issued on the absence of any data with respect to the effect of mineralised methylated spirit in gelatine emulsion, I should like to say that, so far as I have tried it, it does not appear to have any harmful effect whatever, and that it is quite impossible to distinguish between plates coated with emulsion containing mineralised spirit, rectified spirit, or without spirit entirely.

In proof of this I made the following experiment, which may be of interest to some of your readers. An ordinary bromo-iodide emulsion was prepared, boiled for twenty minutes, and washed as usual. To two ounces of this emulsion one drachm of rectified spirit was added. To another two ounces (from same batch) was added one drachm of mineralised spirit. Plates coated with these emulsions, and exposed one immediately after the other, and developed in the same dish, are identical in every respect.

I enclose two plates for your inspection. It would perhaps be as well to add that the above emulsion is of a very robust character and rather slow, and capable of withstanding some rough usage. Whether the presence of mineralised spirit in a delicate, ultra-rapid emulsion, prepared with alkali, would be as harmless, I cannot say, but with the above the effect is *nil*.—I am, yours, &c., THOS. HADDOCK.

27, *Chapel-street, Leigh, Lancashire, December* 23, 1892.

"AN INDIAN STUDIO."

To the EDITOR.

SIR,—In the JOURNAL which reached me to-day I see a letter from Mr. R. W. Robinson regarding Mr. Bhedwar's pictures of the *Rite of Initiation of a Parsee Priest*, and giving *his* reasons why they did not appear at the recent Exhibition of the Great Britain Society.

Now, I was with Mr. Bhedwar for over one hour, during which time I gathered my impression that the pictures in question had been sent home for the principal Exhibition of the year. Mr. Bhedwar certainly made no remarks to lead one to suppose that he entertained such very unfriendly feelings towards the parent society as Mr. Robinson puts into his mouth.

The quarrel over the Exhibition of last year was originally a very petty one, and I am bound to say that from what I read in the several JOURNALS, I rather sympathised with those who left the society, but since then the continually recurring sneers and rude remarks have gone far to alter my opinion, and I am rather inclined now to congratulate the society on the clearance.—I am, yours, &c., YOUR CORRESPONDENT.

December 7, 1892.

To the EDITOR.

SIR,—I find from your remarks on Mr. R. W. Robinson's letter in your JOURNAL of the 18th ult., that you have been at pains to draw from your correspondent a reply conflicting with the statement made by the author of "An Indian Studio." The real facts how the latter contributor got at this information would set all your doubts to rest, and save my friend, Mr. R. W. Robinson, from any further trouble *re* the question of exclusion of my *Naver* from the Pall Mall this year. There is no doubt that at first the *Naver* was intended for the Pall Mall Exhibition. When this series was completed, some art critics of local newspapers took a very favourable notice of them, upon which they were sent to some distinguished personages, such as H.E. the Viceroy, and H.H. the Gaikwar, to be seen. At that time a note at foot of the pictures in pencil was affixed to the effect, "Specially done for Pall Mall Exhibition, London." Some how or other, when these pictures were returned, the above remark was not erased but allowed to remain as it stood. In all truth, this remark must have been read while inspecting the pictures in question by the author of "An Indian Studio" when he came to have an interview with me. But it was very long before the visit of this gentleman that I had requested my friend and agent, Mr. R. W. Robinson, to withhold my work from the Pall Mall Exhibition upon certain grounds of my own. Before I conclude, I hope this explanation would sufficiently exonerate Mr. R. W. Robinson from any wrong imputations that might have come to be alleged against him.—I am, yours, &c., SHAPOOR N. BHEDWAR.

[This correspondence here terminates.—ED.]

DIPPING-BATH DEVELOPMENT.

To the EDITOR.

SIR,—With reference to Mr. Meldon's letter on the above subject in your last issue, I should like to refer you to a paper on "An Apparatus for the Development of Photographic Plates without the Use of a Dark Room," published in the *Journal of the Society of Chemical Industry* for January, 1891.

I there described an apparatus of the dipping-bath form, capable of containing several plates, and which has the advantages referred to by Mr. Meldon. The bath is not in the market, but as it is not patented, any manufacturer is at liberty to introduce it. I enclose a copy of the paper.—I am, yours, &c. ALEXANDER WATT.

Liverpool, December 19, 1892.

LOCAL REDUCTION.

To the EDITOR.

SIR,—On reading your article on "Local Reduction of Negatives" in last week's JOURNAL, I was rather surprised that you made no mention of the alum and citric acid clearing solution. I have on various occasions tried the methods you mention, but, if you will pardon my saying so, I do not think one of them, for general usefulness, can "hold a candle" to my favourite. Space will not permit me to mention half the miscellaneous subjects that I have successfully treated by local application of the clearing solution, such as bringing out the buried inscription on an over-developed tombstone or such like subject, reducing the density of windows and other objects in interiors which happen by contrast to be too pronounced, or improving sky or water in landscape.

But it is in portraiture that it excels, for by its means a big ear, or protruding lip, high cheek-bone, bald head above a sunburnt face, or (in case of a lady in evening dress) the white neck below a sunburnt face, may all be made to lose their undue prominence and be brought into harmony. And, further, I have even, by applying it only to what should have been the shadow side, made passable things of negatives that would otherwise have been useless owing to their flatness and want of effect; in fact, there is a very wide scope for any one with a little artistic skill, particularly if accustomed to use the brush. The reason, no doubt, many have failed is that they have attempted these things upon a wet surface, and any great amount of success in that way is utterly impossible for obvious reasons.

Some may be led to remark that this method is all very well for negatives of a high colour, but that with so-called colourless negatives it is useless. But I would ask any one to try such a negative, and to follow your recommendation, and get a print off before being quite sure that the printing quality has not been changed; for, after trying hundreds of various kinds, I have found that in almost every case they are amenable

to treatment if they have not already been through the clearing solution.

One word as to method of procedure. I perform this operation in daylight, having the solution in a white porcelain dish, and water in another dish, in case it is needed. I use an old sable brush—one that is just too far gone for spotting prints does very well—and, dipping this into the solution, I touch very carefully the parts to be reduced. If the action is slow, I lay the negative across the dish, and proceed to treat another in the same way, just watching to keep the places moist until the desired effect is attained. I then slip the negative into the dish, and flow the solution once or twice over it, which is quite sufficient to remove all traces of the local treatment. I then get it washed as quickly as possible. Of course, if any further local treatment is found to be necessary after the surface has become wet, the negative will need to be dried before repeating the process.—I am, yours, &c., T. S.

December 20, 1892.

Answers to Correspondents.

*** *Communications relating to Advertisements and general business affairs must be addressed to* "HENRY GREENWOOD & Co.," 2, *York-street, Covent Garden, London.*

T. H. DE PIEFFE.—Received.

C. H. YOUNG.—We note your remarks.

HERTS.—We did not retain the address.

GRAYSTONE BIRD.—The slide is excellent, and comes out very well on the screen.

S. W.—The scratches on the prints are caused by particles of grit on the surface at the time of burnishing.

"BEAUCHAMP" is requested to communicate with Mr. H. Wilkinson, Churchgreen Studio, Harpenden, Herts.

W. DAVEY.—The only manufacturers of celluloid in this country that we know of are the British Xylonite Company, Homerton, E.

A. THURSTON.—Bleaching the image with bromine water and redeveloping does not by any means confer as much density as bleaching with mercury and darkening with ammonia.

C. A. SCHMELDT.—The best hypo eliminator is water. The action of the so-called "hypo eliminators" has so often been described, and their disadvantages pointed out, that we can only refer you to back volumes.

A. LARRANCE.—It would certainly be a waste of time to clean off the spoilt negatives with the idea the makers of the plates will purchase the glass for recoating. It is more than doubtful if they would accept it as a gift.

C. WILTON.—We cannot recommend a gas stove of the form and size named for heating a studio of such dimensions. A good large coke stove, or even two, would be necessary to render the building at all comfortable in weather such as that we are now having.

E. J. M.—The object-glass (or glasses if more than one) for a focussing finder should be achromatised. For an eyepiece, the most convenient is the non-inverting one in ordinary pocket or terrestrial telescopes, although we have used the Ramsden eyepiece with success.

WARDEN.—1. Unless the slides are larger than the usual size—three and a quarter inches—there will be no advantage in a five-inch condenser. On the contrary, it will involve a loss of light. 2. Amidol will answer. 3. For bromide enlargements the ferrous oxalate is the developer most used by professionals.

RONALD.—A studio eighteen feet long and ten feet wide is not at all adapted to taking groups in—that is if the number included in the groups exceed two or three persons. Equal illumination over the whole of the figures will not be obtained, and only very wide-angle lenses could be used, and these would give violent perspective.

NOVOCASTRIENSIS.—The negatives certainly appear to have been under-exposed; but we should like to know the temperature of your developing solution before pronouncing any decided opinion. Chemical action, as we have often pointed out, is accelerated or retarded by the rise or fall in the temperature of solutions.

W. RESKER.—You are rightly informed that the argentometer is not an accurate register of the strength of the sensitising bath; but, within certain limits, it is sufficiently reliable for all practical purposes—that is, providing the bath contains no other salt than nitrate of silver, and that obtained by double decomposition from the paper.

J. MARSHALL.—You are only one of a vast number whose eyes are dissimilar in focus. We cannot tender you any advice in the matter, nor can we offer an opinion as to the ability of the firm mentioned to treat the case. As you can see to retouch sufficiently well without spectacles, it would be better to do without them until compelled to wear them.

A. R.—The cause of the cold and inky-like tones in the pieces of enlargements sent is under-exposure and forced development. The remedy is simply a longer exposure. In some of the examples the exposure given might well have been doubled, or even tripled, without fear of its being overdone. Instead of working by set rules, try and profit by experience.

J. B. CURRY says: "I am about to take out a provisional specification of a patent for an improvement in connexion with photography. Can you tell me if, when a provisional specification has been accepted by the Patent Office, I can, without invalidating that protection, describe my invention to a firm who are likely to purchase it?"—Yes, that is one of the chief objects of a provisional specification.

O. CARTER.—Nothing can now be done with the Daguerreotype but washing it in a weak solution of cyanide of potassium, giving preferential treatment to the end most stained. We warn you, however, that unless you are expert at such work the portrait may become obliterated entirely. A delicate Daguerreotype cannot stand the evidently coarse treatment to which this one has been subjected, judging from your letter.

A. R. C. wishes to try making burnt-in enamels, and asks "where the proper kind of furnace and muffles are to be obtained?"—Doulton & Son, Lambeth, supply all kinds of furnaces and muffles. Fletcher & Sons also supply very convenient furnaces for the purpose in which gas is the source of heat. For working on a small scale, a furnace of this description will prove more convenient than one consuming coke or charcoal.

A. M. M.—The figures represent the spherical aberration of the individual lenses, neglecting thickness and worked out to the first approximation. If the figures given be multiplied by $\frac{y^2}{f}$, they will give the difference in focus of the central and marginal rays where y is the distance of the marginal ray from centre, and f the reciprocal of the focus.

*** "*Editorial Table*," *and several other communications unavoidably held over, in our next.*

WEST LONDON PHOTOGRAPHIC SOCIETY.—January 3, Technical Social Meeting.

PHOTOGRAPHIC CLUB.—January 4, *Collodio-Chloride Printing.* 11, Members' Open Night.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—January 5, *Exposures*, to be opened by Mr. A. Cowan. 12, Ordinary Meeting. 19, Monthly Lantern Night.

THE inaugural meeting of the Harringay Photographic Society will be held on Thursday, January 5, at the Endymion Restaurant, adjoining Harringay Park Station, Midland Railway, commencing at eight o'clock, when Mr. Dudley Towers will take the chair. For further particulars, apply to Mr. C. Frith, 8, Cavendish-road, N.

HEMERY'S MEDALLION GROUPS.—Messrs. Marion & Co., of Soho-square, are introducing seven different arrangements of Hemery's medallions for portraiture. Each medallion group has its appropriate set of masks for making the negative, also the masks and discs for printing. Mr. Hemery has adopted the novelty with gratifying results, and Messrs. Marion anticipate that it will be welcomed by photographers generally. The cost is comparatively small.

THE Durham City Camera Club will hold an exhibition of members' work in the Shakespeare Hall, North-road, Durham, on Tuesday, February 14, 1893. The following classes are open only to amateur members of the Club:—General (landscape, architecture, &c.).—Set of six direct prints, 5×4 and under, mounted on one mount. General (landscape, architecture, &c.).—Set of three direct prints, half-plate and above. Portraiture or group.—Set of three direct prints, any size. One enlargement print from original negative to accompany exhibit. Set of four lantern slides. The following class is open to all: Set of six lantern slides. In this class a silver and bronze medal, given by the Mayor of Durham, will be at the disposal of the Judges. The Hon. Secretary is Mr. R. Hauxwell, The Avenue, Durham.

FORTHCOMING EXHIBITIONS.

1893.		
February 1	.....	*Cleveland Camera Club. Hon. Secretary, J. J. Hallam, 11, Amber-street, Saltburn-by-the-Sea.
,, 7, 8	.....	Rotherham Photographic Society. Hon. Secretary, H. C. Hemingway, Rotherham.
,, 14	.....	Durham City Camera Club. Hon. Secretary, R. Hauxwell, The Avenue, Durham.
,, 16–18	.....	*Woolwich Polytechnic Photographic Society. Hon. Secretary, W. Dawes, 145, Chesnut-road, Plumstead, S.E.
,, 18	.....	Holborn Camera Club. Hon. Secretary, F. J. Cobb, 100 High Holborn, E.C.
March 1, 2	.....	*Fillebrook Athenæum Photographic Society. Hon. Secretary, Joseph W. Spurgeon, 1 Drayton Villas, Leytonstone, Essex.
April 17–29	.....	*Photographic Society of Philadelphia. Hon. Secretary, R. S. Redfield, 1601, Callowhill-street, Philadelphia. U.S.A.

* Signifies that there are open classes.

CONTENTS.

MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."] [*October 7*, 1892

THE LANTERN RECORD.

CONTENTS.

COMMON GAS FOR DOMESTIC LANTERN ENTERTAINMENTS.

VERY numerous indeed is the class who, desirous of giving a quiet parlour entertainment to a few friends, eschew the illumination of the lantern by the three or four-wick petroleum lamp on the one hand, with its often unpleasant smell and its unremittingly required attention, and, on the other, the oxy-hydrogen limelight, which does not always lend itself to an impromptu exhibition.

To such the use of common domestic gas would prove a boon, provided that it gave such an intensity of illumination as would equal, or even nearly equal, the oil lamp, and enable a disc of six or seven feet in diameter to be produced. As to the facilities implied in the employment of house gas for this purpose there can only be one opinion. The lantern is mounted on its stand, the tubing is connected with the gas bracket, and all is ready.

The poverty of gas as a means of lighting is the paramount drawback to its being used; but, when by such means as those about to be described it is enriched, then does it serve the purpose very well, as we have had frequent occasion to determine.

First of all, concerning the burner to be employed. Every connoisseur in gas lighting is aware that there are now several in the market by which the maximum light capable of being given by gas is obtained, but unfortunately the form of the flame is not suitable for the purpose now under consideration.

After trying argand burners of various dimensions, we give preference to a pair of small-sized fishtail burners placed one in front of the other and separated from each other to the extent of about an inch. They must have their flat sides of the flame towards each other, care being taken that the flames do not come into contact. A special feature consists in there being a reservoir placed over the flames in such a manner as to heat the reservoir slightly in order to vaporise a supply of hydrocarbon placed therein. We have tried several of the hydrocarbons, such as oil of turpentine, naphtha, &c., with success, as the gas, which must be made to pass through this reservoir, becomes so enriched as in some cases almost to dazzle the eye.

But the best of all the substances is one known in commerce as albo-carbon, which sells at a few pence per pound. In our lantern burner there is a tap by which the proportion of the vapour to be mixed with the gas can be regulated to a great nicety, the correct adjustment being that at which the flame gives no smoke, which would be the case were the carbon in excess. When once adjusted, no further attention is required.

The increase in the luminosity caused by this is so great, that if the albo-carbon tap be closed, and the gas from the mains alone be allowed to pass, the disc on the screen is instantly rendered comparatively dark.

Of course this is not recommended as a substitute for the lime light, when there is a large audience and the best effects possible are desired to be attained; but it forms a convenient means of utilising common gas under the circumstances already mentioned, viz., when an impromptu entertainment is desired to be given to a few friends assembled in one's parlour, and when it is not considered expedient to offend the olfactories by the usual four-wick petroleum lamp or to induce a *soupçon* of danger by the introduction of oxygen, whether stored in a bag or compressed in a bottle.

LANTERN NOTES AND NEWS.

WE understand that at the recently opened Trafalgar Square Theatre it is proposed to utilise the optical lantern for projecting pictures upon the drop scene between the acts.

* * * * *

WE should be glad if Secretaries of Societies would send us the dates of their lantern evenings for inclusion among our fixtures, as well as particulars of lantern-slide competitions which may be in progress.

* * * * *

LANTERN entertainments in and around London do not excite anything like the interest among the general public which is the case with similar exhibitions given in many of the large provincial towns, and the reason for this we do not hesitate to set down as the failure on the part of photographic societies to undertake such entertainments on a sufficiently extensive scale, and to give them the necessary publicity beforehand. Among the London societies are some of the most successful makers of slides, and we are sure that with a little energy and enterprise it would be possible for several of them to organize lantern entertainments at which the outside public, for a moderate admission fee, would attend in numbers sufficiently large to make the venture remunerative.

* * * * *

CONVERSING recently on this subject with Mr. George Mason, he informed us that the series of lantern lectures which has lately been delivered at the Glasgow Institute of Fine Arts by well-known photographers attracted uniformly good audiences—as much as £20 and

£30 being taken for admission on some evenings. The series was well advertised beforehand, and was almost exclusively patronised by the general public. The subjects chosen were of interest to popular audiences, Mr. Mason himself, as we remarked in THE JOURNAL last week, treating of *Mary Queen of Scots; Her Palaces and Prisons.* The outside public, as a rule, gets comparatively few opportunities of observing to what a pitch of excellence and beauty the production of lantern slides by amateur workers has been brought.

* * * * *

AT the meeting of the Manchester Society on September 8 Mr. Alan Garnett introduced a substitute for the lime cylinder, to be used for the oxyhydrogen light. It was composed of a preparation of magnesia, in the form of a small disc (about the size of a sixpence); a platinum pin in the edge enabled it to be fixed in a suitable holder on the ordinary lime piu. Mr. Garnett stated he used it with a blow-through jet; with a mixed jet it did not give as good a light, the reason of which he could not explain. When the light was once adjusted, no further attention was required, and the disc was unaffected by the ordinary atmospheric moisture when not in use, qualities which were of great advantage over limes. As far as Mr. Garnett could at present tell, the substitute was fairly durable, and each disc would last a considerable time. A rough trial was made in the lantern with the new disc against lime, a blow-through jet being used, and, as well as could be judged, the lights were equal, some being inclined to award the new light superiority in purity. We believe it was proved years ago that, under proper circumstances, a more brilliant light could be obtained with the magnesium disc than with the ordinary lime. Decidedly its imperviousness to atmospheric influences is a quality in its favour.

* * * * *

AN annual exhibition at which lantern novelties could be fully represented is still a *desideratum.* At the present Photographic Society's Exhibition in Pall Mall only one lantern is shown, and this notwithstanding the fact that the opening of the exhibition is practically contemporaneous with the opening of the lantern season. Why is this? It is hoped that in the new premises, which it is stated the Society will next year occupy for the purpose of its annual exhibition, a separate apartment will be reserved for apparatus, among which there will be a good display of lanterns and accessories. According to the present system, the apparatus has necessarily to play an absolutely unimportant part.

* * * * *

FOR those who, whether from choice or necessity, have to make oxygen for themselves instead of obtaining it compressed in cylinders as so many now do, the proportions for an oxygen mixture, given a few years since by Mr. E. Holland, will be found to possess certain advantages. It consists of—

Chlorate of potash	8 parts.
Oxide of manganese	2 „
Common salt	1½ „

This, when in the retort, responds quickly to the variation of the heat applied, and yields a large proportion of gas.

PROGRESS OR FASHION?

How much of the present design in optical lanterns and projection apparatus is due to progress or influenced by fashion?

This is a question that may well be asked in the first number of a Lantern Supplement; and, on looking back with an experience in the lantern world of more than a quarter of a century, it seems to me the answer may very fairly be said to be the greatest share is "Progress." The marked difference of late has been in the gravitation of the special designs, or those possessing most originality, to either extreme, viz., "The Giant" or "The Pigmy."

The large objectives (now recognised and admitted, after much question and adverse criticism, to be superior for long distant projection) necessitated modified apparatus, for the weight of the fronts, when extended to get the correct focus, needed supports, hence the greatest departure in design of dissolving view apparatus, as carried out for Sir David Solomon, which followed the appearance of the Triple Rack, the "Doowra," and the "Perfect" Triple lanterns. Miniature lanterns have been to the fore, and various designs have been placed on the market to secure efficiency when working, and yet be convenient for personal carriage. Notably the lanterns with fronts to reverse and pack inside the body; while those which slide in the body (the outcome of suggestions of Mr. Andrew Pringle) prove to be practical as well as portable.

Camera bellows fronted lanterns are becoming popular, and here we have a revival of a very early type of lantern, and one which in America has been in use for years. From the same country came the demand for large-size front lenses, and, when one or two popular lecturers (notably Mr. French and Mr. Snazelle) exhibited what could be done on a large scale at the Crystal Palace, and elsewhere, our own representative lecturers followed suit.

The developments of apparatus in this country (as is usual when once the requirements are made known) have been marvellous, and it is only necessary to look at the Almanacs and Year Books to see what great alterations (and probably advancements) have been made in lanterns during the past few years. The perfection of detail follows as a matter of course as long as users of apparatus will purchase and so encourage makers to invent or improve.

Simple apparatus of the old order can no doubt produce good results in the hands of operators who have manipulative skill and possess the necessary coolness; but there are so many who cannot help getting excited when in the presence of an audience, and these find the modifications a great boon. For instance, what is more disconcerting than for an accidental touch of the back of the jets to upset the centering of the light, and for the operator to see the disc on the screen partly obliterated? The improved supports and clamping pieces to jets or vertical rack work makes this sort of contretemps an impossibility. So again with the adjustments to fronts of biunial and triple lanterns. The new designs have originated because the old were "tried and found wanting" at times.

With the extended use of the electric light, greater attention has been paid to projection apparatus, and, although most of the improvements follow on the lines of apparatus in use twenty-five years ago, certain departures have produced in the result a polariscope and a microscope that can be distinctly stated to be a decided "progress."

Thanks to the experimental and practical work of the Rev. P. R. Sleeman, Professor Sylvanus Thompson, Mr. Lewis Wright, Sir David Salomons and others, results can now be obtained when illustrating the phenomena of polarised light of almost equal excellence and certainly with most of the practical value of that obtained by the late Mr. Spottiswoode, who had the unique advantage of a magnificent polarising prism of Nicol's form. When Iceland spar became so scarce in large size of necessary purity, a substitute had to be found, and the elbow polariscope, with its polarising bundle of glass, not being so convenient as the direct working form, the arrangement of making the artificial glass prism was tried, and after that the double reflecting polariser used. This permits of rays entering and leaving the polariser in a horizontal plane, and gives sufficient light for all optical experiments in connexion with polarised light. With the microscope, the improved objectives, complete set of condensers for the various powers, parallelising lens, and convenient adjustments to all the necessary portions of the apparatus show in the result a distinct advance on the "Duboscq" projection microscope and others of that class, while the simple instrument with its one substage condenser for using with the objectives of the table microscope gives results in advance of the tube form of microscope of old, with its uncorrected powers, besides being more convenient to use.

The condensed-gas system, with automatic regulation, has almost entirely shelved the gas bags, while the cheapening of oxygen by patent and other processes has done away with the necessity and trouble of making one's own oxygen gas. The high pressure that can be safely used has given a power that has been availed of in making mixed gas-jets to give a higher illuminating power; and here, again, is progress, for "light, more light" is the requirement of demonstrators using projection apparatus. The "Focus" incandescent lamp of 100-candle power is a capital illuminant for those who have the electric current laid on in their houses, and when one thinks of the great trouble it was to produce an electric light in the old days we have here a distinct advance and a saving of labour, for, by simply switching on the current when once the connexions are made, a nice disc of moderate size can be produced, and photographs projected on the screen large enough for any number of friends in a drawing-room to see the detail properly. This, without the drawbacks inseparable from paraffin-lamp illumination.

To sum up, no doubt there is a certain amount of fashion in the size and design of lanterns, and the form of accessory apparatus, but the improved capabilities of same point to the fact that "progress" has not been slumbering.

G. R. BAKER.

LANTERN CONDENSERS.

[Stereoscopic Club.]

When a beam of parallel light, A A (Fig. 1), falls upon a convex lens, he rays will be bent towards the centre and made to converga approximately to one point *f*, which is called the principal focus. If, on the

Fig. 1.

other hand, a diverging beam of light proceeded from a point at *f*, the rays could be traced back—that is to say, they would, after leaving the lens on the other side, proceed parallel to A A.

If the point of light be brought nearer to the lens than the principal focus *f*, as shown at A (Fig. 2), the lens would have too much work to

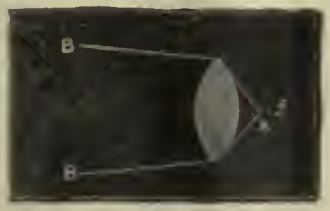


Fig. 2.

perform to send the rays parallel, and they would proceed from the lens still divergent as B B, though not as much divergent as before they entered the lens.

When the point of light is outside the focus, as at A (Fig. 3), the rays on the other side of the lens will meet at some point B (approximately), and if the point of light be moved to B the rays would meet at A; so we

Fig. 3.

see that A and B are reciprocal, and are called the conjugate foci, one having a distinct relation to the other. As the point of light A (Fig. 3) advances towards *f*, the conjugate B will move away from the lens on the other side, but not in the same proportions as A advances, for the longer focus always moves more rapidly than the shorter. If we assume the lens to be 3-in. focus, the conjugates A and B being equal, will be 12-in. apart or 6-in. from the lens on each side.

In Fig. 4 we have caused the point of light A to be brought nearer to the lens than is shown in Fig. 3, let us say to 4-in. The conjugate B

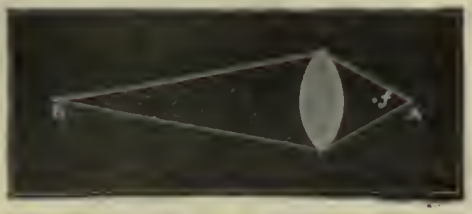


Fig. 4.

has moved further away from the lens—to 12-in. (4-in. and 12-in. being the conjugates of a 3-in. focus lens), and if we move the point of light A still nearer to *f*, say to 3½-in., the conjugate B will be found at 21-in. on the other side, and so on as A approaches the lens, B recedes, until at length, when the point of light arrived at *f*, parallel rays would be produced as shown in Fig. 1.

The Functions of a Lantern Condenser.

Now, let us see how these few remarks apply to a lantern condenser. One important function in a condenser is to collect as much light as possible, and in passing it through the slide, the rays now forming the picture must converge to a point somewhere in front, and that *somewhere* is in or about the centre of the objective in use—that is to say, the objective must be at B (Fig. 3), or at B (Fig. 4).

When a lantern and screen have been assigned to their respective places, there is only one position for the objective in use to make the picture focus on the screen, and as the conjugate B must meet in the objective, and, as has been shown, this conjugate has another conjugate A, which is the point of light, it is quite clear that the focus of the objective defines the position of the light.

If, then, the condenser be 3-in. focus and the objective 12-in. (or such as would require the conjugate B at 12-in.), then the point of light must be at 4-in. from the lens, as shown in Fig. 4; but if an objective of 6-in. focus be applied, the light must be moved back to 6-in., as shown in Fig. 3.

Now, the law that "diverging light varies in intensity inversely as the square of the distance," shows clearly that by moving the light back from 4-in. to 6-in. we have lost about one-half of it, and demonstrates the fact that whatever be the focus of a condenser best suited to a long-focus objective, it cannot possibly be near so good—as a light-collector—as a shorter-focus condenser would be when shorter-focus objectives are employed.

There is a limit to the shortness of focus for a lantern condenser, on account of the heat given off by the incandescent lime, and when this limit has been reached for use with a short-focus objective, the condenser must inevitably break if an objective of longer focus be employed.

Double Condensers.

Single lenses, such as are shown for simplicity in explanation at Figs. 1 to 4, are never used as lantern condensers for two good reasons, firstly, they would be too thick to stand the heat given off with the light; and, secondly, they suffer from a defect known as spherical aberration, of which we shall have something to say presently.

A biconvex lens of 3-in. focus and 4½-in. diameter would be about 2-in thick, and would not stand the heat for many minutes.

Now, let us see what two lenses will do.

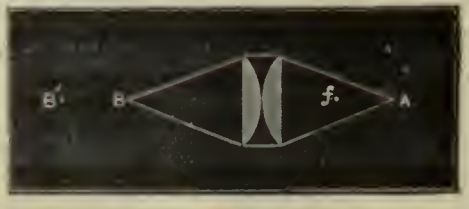


Fig. 5.

In Fig. 5 we have two plano-convex lenses, under similar conditions as explained in reference to Fig. 1; divergent light from a point A immerges practically parallel, and parallel light falling upon the second lens is conveyed to B; here we have very nearly the same conditions as at Fig. 3; but these two lenses, which are each 6-in. focus, are only half the thickness, consequently they are less liable to fracture by heat. If we place the point of light near to *f*, the rays immerging would diverge (see Fig. 2), and these diverging rays, falling upon the second lens, would converge to the conjugate B^1; but these lenses, being of equal diameters, the second lens would not take up all the diverging rays from the first lens, the marginal rays would be thrown into the mount, and therefore lost, as shown in Fig. 6.

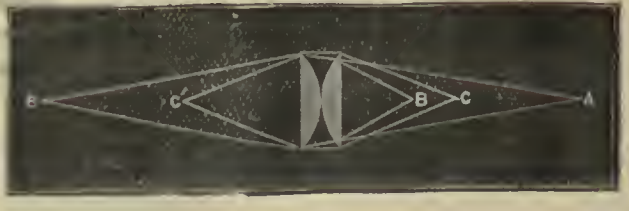


Fig. 6.

Where, for a pair of 6-in. focus plano-convex lenses, A B^1 represents

the conjugates of the second lens at 12-in. each; C C^1 the conjugates of the pair of lenses, viz., 6-in. on each side; B B^1 the 12-in. and 4-in. conjugates of the pair of lenses, and demonstrates the fact that of a 4-in. diameter front lens only 3½-in. of its diametar is utilised when the 12-in. objective is employed.

Triple Condensers.

If we introduce a third lens, which should be of long foci and consequently very thin, we should be able to get the light within the distance of say 2-in.; this would diverge the rays, and the middle lens would receive the diverging rays and pass them on practically parallel to the last lens, which would converge to the conjugate B^1, as shown at Fig. 7.

Fig. 7.

The advantage, then, is that we get a thin lens of suitable focus and diameter close up to the light, and with such a combination as shown at Fig. 7 light may be collected and utilised up to an angle of 95°, which is not possible with any single or double condenser.

Very early in this communication it was said that rays converged *approximately* to one point; for, as a matter of fact, no single lens having spherical surfaces has the power to converge rays *absolutely* to one point, so that it is not possible by any single lens to obtain an exact focus.

Sir John Herschel has shown that the spherical aberration may be reduced to one-fourth of that of a single lens in its very best form, by means of two plano-convex lenses having their convex surfaces towards each other, and their radii as 1 to 2·3.

But it was Dollond who, over one hundred years ago, first laid down the principle that spherical aberration of single lenses is proportional to the cube of half the angle of the transmitted rays. But, says Dollond, "if two glasses be so proportioned and situated that the refraction be equally divided, then they will each produce a refraction equal to half the required angle, and therefore the refraction, being in proportion to the cube of half the angle taken twice, will be but a fourth part of that which is in the proportion to the cube of the whole angle, because the cube of one is but the eighth part of the cube of two, and so the aberration where the two glasses are rightly proportioned is but the fourth of what must inevitably be when the whole is performed by only one lens."

Now, by the same reasoning, where the refraction is divided between three lenses, the aberration will be found to be but a ninth of what would be produced by a single lens, because three times the cube of one is but one-ninth of the cube of three.

To those who have followed what has now been said, the advantages of a triple condenser for lantern purposes must be manifest.

The condenser which we now introdnce to your notice is a triple combination, constructed on the lines here advanced, though the foci of the lenses mentioned to illustrate our remarks are not necessarily those we have adopted.

No reference had been made to the density or quality of glass, or to the various forms of condensers, and some other matters, with a desire not to make this communication too technical.

W. I. Chadwick.

LANTERN SLIDES BY REDUCTION.

[Holborn Camera Club.]

We are fast approaching a period when most of us will be looking back upon our summer's work; for the sunshine is leaving us, and the days are getting perceptibly shorter, and so we have to slacken speed, so to speak, giving us time to look back upon the path we have come.

We shall be turning out our negatives of '92, not with a view to printing, for this we have been doing for some time past. No! This time we have something else in our mind. We are thinking of lantern-slide making, and to that end we shall be reviewing them, good, bad, and indifferent.

We have looked them all over, and made our selection. Negatives brilliant and full of pluck, sharp and vigorous; one or two, perhaps, of the indifferent class—in other respects, perhaps, acknowledged failures; but we have selected them, for there is a small portion including, most likely (if the subject be landscape), distance and middle distance—or, in any case, a piece that is interesting, and from which we can get a good lantern slide by contact. We remember discovering this during their development, and how it had consoled us, to a certain extent, for our great disappointment at the general result. It was this that gave them their ticket for the fixing bath, and thus they were spared from the dust-heap and oblivion.

Why is the Reduction Method Neglected?

But, I would ask, how many are there who never made lantern slides but by this one method of contact in the printing frame, regardless of what there is in the negative besides the small piece which is taken to make a picture by itself? Why is it that so many amateurs who take up this most engrossing branch of photography never get any further than this stage? It cannot be that all their pictures require this very extensive trimming. I am not now referring so much to quarter-plate workers as to those who work in the larger sizes, for, obviously, the quarter-plate better lends itself to be used for the making of lantern slides by this means without, perhaps, serious loss of subject. Although even here, in many cases the compulsory cutting down of the picture is anything but an improvement, to say the least of it, especially if care has been taken in the selection of the subject and to get it properly on the plate. In such a case, to do the picture justice, a reduction must be made.

Why is it, I say, that this reduction is not more practised? Why should we not see your work on the white sheet without this mutilation? Let us see it as it is hung in the frames around your room?

The Apparatus Required.

I have not spoken disparagingly of the contact method, neither is it my intention to do so, for it is a very convenient and useful method, which does not require my demonstrating. I simply protest against its indiscriminate application. The excuse for this is generally, "Oh! it's such a trouble to reduce;" and the idea prevails with some that special apparatus is required. Now, it is my purpose this evening to prove that this is not the case, and I will endeavour to explain to you how lantern slides may be made by reduction from large negatives without any difficulty whatever, without any special apparatus beyond a deal board and two strips of wood. What I am about to describe to you now is no novelty, neither do I claim any originality for it; but it is a simple and, at the same time, practical arrangement. Assuming that your camera and lens are of half-plate size, and that the negatives to be reduced are of similar size, it will be best to have our board about nine inches wide, and for length three to four feet will be ample for all our requirements, the two strips of wood about the same length.

First of all, we set the camera up on one end of the board, then measuring the distance from board to centre of lens aperature, we mark same off upon a strip of wood or cardboard, which can be temporarily tacked on to the centre of the other, and so that it stands up vertically in front of camera. This done, we now take a printing frame, and having removed both back and springs, place in a spoiled negative, on which draw diagonal lines from corner to corner, so as to mark the centre; fasten this in with a drawing pin top and bottom. Now, we have to secure our frame on the end of the board with open side facing the camera, so that the centre corresponds with the mark on the piece of stick. There are two ways of doing this: either by placing a block of wood underneath, and screwing from beneath the board, or by screwing the frame between two upright pieces which can be secured to the edges of the board; either method will allow of hinges to be used, so that the frame can be shut down when out of use, but this is not essential to the efficiency of the apparatus.

Having done this, it will be well to test, by focussing in the camera, as to squareness and centering; this is best done by placing the apparatus, for that I will now call it, in a similar position to that which it will occupy when in use, viz., at a window, so that there is nothing to obstruct a clear view of the sky when looking through camera with negative removed. When found correct, take a lantern-cover glass, and, using it as a guide, mark off its dimensions on the centre of the focussing screen; now shift the camera up or down the board until a full view of the negative in frame is included in this space; then screw a strip of wood across the board at the back, and close up the camera; this will form a register, and keep it in position when the board is sloped (as it will most likely be, to get a clear view of the sky); similar strips or blocks should be fastened down either side to prevent shifting sideways. All that has to be done now is to secure the long strips of wood to the top of the frame—one at

each corner—so that the other ends rest on top of the camera at either side, and these can be joined by a strip across; then cover over with a focussing cloth, which can be secured by drawing-pins underneath, and now you have a serviceable reducing apparatus, and all you require is a lantern-plate carrier for your dark slides, which can be bought for a few pence, or a quarter-plate carrier, if you have one, can with very little ingenuity be adapted.

J. F. Stevens.

LANTERN SLIDES OF BEES.

Mr. R. A. H. Grimshaw writes as follows in the *British Bee Journal*:—

A few nights ago I had the privilege of spending an hour or two at a private *séance*—a dark *séance* it was, too, excepting as regards light reflected from the screen. To have the opportunity of seeing original photographs mounted as lantern slides and projected by the limelight lantern—photographs taken in Africa, America, and in almost every country in Europe, the whole of them from beginning to end being the handiwork of the exhibitors—was a rare treat indeed, and only to be equalled by the honour of having Mr. Cowan himself at the lantern, a work entailing more labour and fatigue than appears at first sight. Well, it was only one *more* proof of the love and self-sacrifice he has for bee-keeping and all that interests the bee-keeper.

To say that this exhibition of sun pictures from Nature herself was surpassed by a private view of the whole of the magnificent series of lantern slides on bees and bee-culture just issued by Messrs. Newton & Co., would be to say falsely; but speaking as a practical bee-keeper, who tries as much as possible to be *au courant* with the latest discoveries in the craft, I can fairly say that the whole fraternity are much indebted to the firm named for their enterprise and foresight in offering to the bee-keepers of the world such a magnificent *suite* of educational items. They are truly cosmopolitan and speak their tale through the eye, requiring no language of explanation to the apiarist, and very little I ween to even those who "do not know a bee from a bull's foot."

As artistic productions, real works of art, I must first speak of them. Mr. Freshwater, whatever else he is, is an artist, for he has succeeded in giving us *pictures* out of such prosaic materials as the appliances of a bee master. There is a balance and a grouping together, besides an acquaintance with chiaroscuro, telling of something beyond mere photography. The series of thirty-seven slides focus what appears to me a perfect educational code of bee-keeping. The wonder is, indeed, how we have managed winter evening lecturing so long without such necessary aids. One thing ought not to remain unsaid. The physiognomy of Mr. W. Broughton Carr seems destined to be handed down to posterity in these pictures, as the actual manipulator from whom the photographer has taken his subjects, the practical bee-operations depicted being direct photographs taken at Mr. Carr's apiary in Kent. In saying this, it will be taken for granted that in the bee-work pictured there is reliable evidence of the *workman*. I trust Messrs. Newton will see the advisability of advertising these beautiful slides for the benefit of lecturers.

GELATINE PLATES FOR LANTERN-SLIDE WORK.

[London and Provincial Photographic Association.]

In spite of the facility of manipulation and excellence of result claimed for collodio-bromide by many of its adherents, it does not require that one should be an accomplished prophet to predict that eighty per cent. of the slides made and shown at metropolitan and provincial societies during the coming lantern season will be on gelatine plates. For, while admitting that a lantern slide made on a collodio-bromide plate by an accomplished worker in this process is justly regarded among lanternists as the acme of perfection, yet when one comes to consider critically the slides occasionally shown at societies' meetings by average workers in collodio-bromide, and contrast them with the slides of the average worker in gelatine, it must, I think, be conceded that the advantage is with the latter. Again, there is a convenience and certainty about a gelatine plate that is rather absent from a collodio-bromide plate; the film is not so liable to abrasion in contact printing, nor anything like so prone to slide off the glass into the developing sink, as is the wicked wont of my collodion films when an especially fine slide is being developed. The development of a gelatine plate, also, is a process which the larger number of lantern-slide makers are sufficiently familiar with to prevent a feeling of strangeness when undertaking it. And, to sum up in favour of gelatine for lantern work, it would, I think, require rather an astute person to distinguish on the screen betweed a first-class gelatine slide and one on collodio-bromide.

When it comes to the home preparation of the plates, a point with which this paper has more particularly to deal, the advantage in simplicity of process and certainty of result is, in my experience, unquestionably on the side of gelatine. I have prepared many batches of collodion emulsion, some of them of very good quality, but could never depend on always attaining the same standard of excellence, and I believe my experience is also that of other workers. In gelatine emulsion making this uncertainty has never presented itself to me provided an approved formula has been adhered to, and the necessary manipulations carefully carried out.

The Preparation of the Plates.

The formula which has given me the most satisfactory result is, with slight modifications, due to Professor Burton, and was selected, after trying several others, because of the good range of colour that could be obtained with it. It is—

1.

Nelson's No. 1 gelatine	80 grains.
Ammonium bromide	210 ,,
Sodium chloride	50 ,,
Hydrochloric acid	5 minims.
Water (distilled)	8 ounces.

2.

Silver nitrate	400 grains.
Water (distilled)	2 ounces.

3.

Hard gelatine (Heinrich's)	400 grains.

Emulsification is performed with the No. 1 and No. 2 solutions, at a temperature of 130° Fahr., and after the silver solution has been added very slowly to the bromised gelatine during its vigorous agitation, the jar is set on one side for a short time, when No. 3 is added, having previously been thoroughly well soaked in distilled water. As soon as the last added gelatine is perfectly dissolved in the emulsion, the jar may be immersed in cold water, to set the contents quickly. It is necessary for success in lantern emulsions to work with solutions as cool as possible, and avoid any tendency to cook. The emulsion, if properly made, should show ruby by transmitted light, and will be in an extremely fine state of division.

After the emulsion has set quite firmly, it has to be washed, and this is accomplished by squeezing it through a piece of moderately coarse "scrim" into distilled water. Some emulsion workers have rather questioned the necessity for using distilled water in washing emulsion, and it may not be so desirable in ordinary negative emulsion, but a careful comparison between slides made from emulsions washed in tap and distilled waters leaves me in no doubt as to the advisability of using distilled water in every instance.

Having left the squeezed emulsion to soak for a short time in the vessel of distilled water, it is squeezed again through the canvas into a fresh lot of distilled water, and again left to soak for a short time. Half-a-dozen squeezes, and as many soakings between are, I find, sufficient to completely remove the bye-products from the small batch of emulsion that the above quantities will make. I consider there is more efficacy in repeatedly squeezing an emulsion than in the long washing so often advocated, and by adopting the above mode of washing it is possible, in a long evening, to make an emulsion, wash and filter it, and coat the plates. It is not necessrry to coat the plate thickly; indeed, rather the opposite is preferable.

Development and Variety of Tones.

With plates prepared in the manner just described, a good variety of tones is obtainable, from quite a warm chocolate to perfect black, and the clearness of the plate, if carefully made, is perfect. The developer with which warm tones are readiest obtained is made up from ten per cent. solutions of sulpho-pyrogallol, ammonium bromide, ammonium carbonate, and ammonium hydrate respectively. As an example I may give:—

Sulpho-pyrogallol	3 grains.
Ammonium bromide	3 ,,
,, carbonate	6 ,,
,, hydrate	3 minims.
Distilled water	2 ounces.

A great variety of tones may be got by varying the exposure and the quantities of the above ingredients.

The fixing bath is not an unimportant factor in procuring excellence in a lantern slide, for however clean the slide may be when it leaves the developer, if the fixing bath be even slightly discoloured, the purity of the slide is sure to be depreciated. The formula I use myself is :—

Chrome alum	1 part.
Potassium meta-bisulphite	5 parts.
Sodium thiosulphate	40 ,,
Water	160 ,,

This bath is an attractive green colour when made up, and retains its clearness until it commences to be saturated with silver, but it has always appeared to me unwise to continue using a fixing bath after it has commenced to show signs of saturation, and I strongly advise the use of two fixing baths in lantern-slide as in negative work. An acid bath before the final washing removes any suspicion of stain.

Intensification.

The intensification of lantern slides is a point deserving of more attention than I think it has hitherto received. With collodio-bromide it is a frequent practice to leave a fully exposed slide under-developed and gain the requisite density by silver intensification. Slides prepared in this manner are of the highest excellence. That gelatine slides have not been treated in the same manner is due, I feel sure, to the uncertainty of intensification. My first essays in this direction were with a modification of Mr. Wellington's sulphocyanide of silver intensifier, in which sulphohydroquinone and sodium carbonate replaced the pyrogallo and ammonium hydrate. The process of intensification was a very slow one, but the resulting slides were of high quality, perfectly clear in the high lights, and the original colour maintained unaltered. This intensifier was discarded, however, when it was found that an ordinary wet-plate formula gave equally good results in a more expeditious manner. The formula here given is one used for collodio-bromide plates and has answered perfectly in my hands for gelatine work :—

Silver nitrate	2 parts.
Citric acid	1 part.
Nitric acid	1 ,,
Water (distilled)	16 parts.

Two or three minims of this silver solution are added to a drachm of the ordinary ten per cent. solution of sulpho-pyrogallol, and the solution poured on and off the plate as in wet-plate redevelopment. When silver intensification fails with a gelatine plate, it is usually because of insufficient washing, and one reason for the success I have met with in the silver intensification of gelatine slides is due, perhaps, to the extreme thinness of the film, which favours the more perfect elimination of the fixing salt. Full exposure, moderate development, and silver intensification is the procedure I would suggest in making lantern slides.

In conclusion, I would like to assure intending emulsionists that they will find the preparation of a batch of emulsion, sufficient for a gross or two of lantern plates, a much simpler matter than the text-books make it appear, and the additional interest it gives slide-making is ample remuneration for surmounting the initial difficulties of the process.

George T. Harris.

STEREOSCOPIC SCREEN PICTURES.

Mr. John Anderton supplies the following further particulars of his invention for stereoscopic lantern projection :—

To obtain the effect of solidity, an ordinary biunial lantern is used, and a stereo transparency being divided, one picture is placed in the top, and the other in the bottom lantern. To obtain stereoscopic effect from the enlarged images projected upon the screen, one picture only must be permitted to reach the right eye, and the other the left eye of the observer, and to effect this purpose the inventor places before the lenses of each objective a polariser of simple construction. The image thus projected upon the screen appears to the unassisted eye to differ in no respect from an ordinary one; but, if it be looked at through a Nichol's prism or other analyser, the picture will be seen to appear and disappear as the analyser is revolved. If each polariser be placed in its lantern in the same position, the two pictures upon the screen appear and disappear at the same time; but, if they be placed at right angles to each other, one will be clear and distinct when the other has disappeared, and, if the analyser be turned through a quarter of a revolution, the latter appears and the former disappears. It is therefore obvious that, if each eye of the observer be supplied with an analyser, each fixed at a right angle to the other, one picture will fall upon the right eye, and the other upon the left, and, as the pictures are superposed upon the screen, no lens or prism is required.

Theoretically, light is lost by refraction, but, practically, it need not be considered, for, with a very moderate quantity of gases consumed, a well-illuminated picture, ten feet square, is obtained. A special screen is used, having a surface that will not destroy the polarisation of the pictures, and the polariser is so constructed that the definition does not suffer to any appreciable extent. The little analysers, or eyeglasses, take a form similar to that of a very small opera-glass, the tubes of which they are formed being one inch in length and one inch in diameter, and the total weight is under two ounces. Each pair has a convenient handle attached, so that they can be held for any length of time without occasioning the slightest inconvenience or fatigue.

The effect of the partial superposition of two dissimilar pictures is, of course, to give a picture blurred with double outlines; but the instant the little glasses are raised to the eyes the picture becomes a well-defined and perfectly stereoscopic one. Special slides are not required. Any negative taken by a stereoscopic camera that is sufficiently sharp to bear the necessary enlargment can have lantern slides made from it, and these can be coloured if desired.

The lanterns are exceedingly simple to use, for, having been turned on, they need no further attention. The operator has, therefore, nothing more to do than change his slides and approximately superpose them. In one instant the polarisers can be withdrawn, and the lanterns used for all the other purposes for which a biunial is required, and, upon the other hand, the polarisers can be instantly placed in position for stereoscopic effects. Messrs. R. Field & Co., 142, Suffolk-street, Birmingham, are the sole makers.

OVERHEATING IN DOUBLE LANTERNS.

In a double lantern where one is placed above the other, as in American lanterns, the difficulty has been to so arrange the ventilation as to prevent the overheating of the upper lantern and yet have it very compact, and comparatively light-tight.

Mr. Charles Beseler, of New York, has devised a simple yet ingenious way of protecting the heat outlets arranged around the top and sides of the casing, by peculiar shaped angle plates, so formed as to direct the escaping heat and reflected light rearward. Any extraneous light is thus prevented from striking the ceiling, the screen, or emerging from the side to the annoyance of the operator. A sheet of asbestos felting is placed between the two lanterns, but does not affect the easy ventilation of the lower one. The light-tight casing is movable on the rods, and, when the lantern is set up, is drawn back, which exposes the condenser and places it outside of the casing, thereby preventing it from sweating or becoming overheated. There are simple but convenient adjustments of the lime carrier, and jets and extra flange rings are provided for the quick replacing of lenses of different foci, according to the size of picture desired. A bellows in front of the slide-carrier prevents the escape of light.

THE LANTERN CRAZE IN PHOTOGRAPHIC SOCIETIES.

To our mind it is decidedly a step in the downward direction when so many of our photographic societies become imbued with the ruling desire to convert everything into a lantern exhibition.

For illustrative purposes, says *Anthony's Bulletin*, especially when used in connexion with a lecture, the lantern has no superior, or even equal. To outsiders and the general public a lantern exhibition has many attractions, and, when used to excite a healthy interest in the doings of a photographic society, it is undoubtedly of much benefit. To such an employment of it we would offer not the slightest objection or criticism. But, alas! few are the cases where the task once acquired remains limited within reasonable bounds.

No other phase of the photographic mania seems to take such absolute possession of its devotees. Once a lantern-slide fiend and everything else is dropped—prints, negatives, everything is judged by the sole standard of "Will it make a good slide?" If so, it is enthusiastically received, and permission is at once craved to copy it. If unsuitable, by reason of some particular quality, which a hundred chances to one is that which makes it especially valuable in your eyes, it is cast aside with a superficial glance, and the lantern fiend goes on with his never-ending search for something to make a slide from. Books, illustrated articles, a few insignificant $3\frac{1}{4} \times 4\frac{1}{4}$ bits out of large negatives—nothing, in fact, is secure from his ravages. And to what end?

Without doubt, this persistency has resulted in a great improvement and perfection of plates, and developers for transparencies, and, so far as it goes, has in this way been of benefit to the fraternity at large.

But it is claimed that slides are far more permanent than the much-abused and evanescent silver print. Try a platinum, or bromide, or carbon, or a hundred other prints, and compare their permanency with your boasted slides. Moreover, let a few of those self-same slides fall on the floor, or come in contact with the vigorous dusting of a lately imported and quarantined domestic. If one out of a dozen survives, you are fortunate indeed.

Moreover, at its best, a development of this kind is a mechanical one, pure and simple—a mere reproductive process, beautiful in many instances, it is true, but neither more nor less than this.

Far different is it to the tentative and careful development of some cherished exposure which you have waited weeks to obtain, and exercised all your skill to have perfect in every detail. Eagerly you watch it come up, faintly at first, then gathering strength and detail. Has the lighting been as good as you wished for? Has the wished-for prominence of a certain object been destroyed by an unsuitable background? By some happy chance did you catch that fleecy cloud bank in the east, and can you keep from losing it in the density of your sky? A hundred questions rise, and with them your hopes. At last it is developed, and you have your perfect negative. Such a beauty! Surely it was worth trying and waiting for, and the skill and experience that you have gained as the years have gone by are something to be proud of—to glory in.

You hasten to contribute a print of it to the Club Album, and perhaps at some future day you have the pleasure of seeing some obscure little corner of it possessed of certain peculiar qualities, thrown upon the screen; and a feeling of longing for the rest of it, and indignation at the man who thus ruthlessly dissected your masterpiece, arises in your breast.

Not satisfied with this mild species of "rubbing it in," you find that the intelligent operator has hopelessly sandwiched it in between a tenement-house scene and the Seventh Regiment marching down Fifth Avenue.

And just here we have another grumble to make, the heterogeneous jumbling together of any number of dissimilar subjects that usually characterises a so-called lantern exhibition.

If any of us had the good fortune to possess a slide of that ancient relic Noah's Ark, it would undoubtedly be placed between "Our President Coming Around the Corner" and that well-known diminutive Negro study of "Who's a Democrat?" followed by the inevitable *chef-d'œuvre* of the evening—an impossible rendering of the two Huguenot lovers, or plain American "Spoons," as our country cousins would term them, were it not for their title.

To return, however, work of this kind is unworthy the serious attention of our societies.

Why not institute competitive researches as well as competitive print exhibitions. Let certain subjects worthy of investigation and discussion be proposed, and the members invited to compete in an investigation of them.

Surely a medal for marked progress in photographic science, not mechanical skill, would be of far more value to the owner, and be far more to his credit than a prize for the best composition of nobody's choice or somebody's impossible offer.

Of course all of us have our hobbies. Some prefer the picture side of photography, some the general investigating side, and some the strictly chemical aspect of our art.

To each we would say, Do some good systematic work, which, when done, would be of value to our fellow club-members, and not serve solely as an ornament to our albums.

Do not crowd out the beautiful—there are enough hard, stern realities in life; but do crowd out that desultory fashion of making exposures at random and because it looked rather pretty on the finder.

If you are interested in faces and types, don't display it by innumerable groups, most of them badly composed, and remarkable chiefly for their stiffness.

Take down your hand camera and frequent the highways and byways of the city. Make your exposures on subjects possessed of action, illustrating some particular trait or characteristic.

The Italian sorting the rubbish on the city dumps; taking his noonday meal; disturbing the contents of an ash barrel, or sporting the gorgeous uniform of the street-cleaning department in a successful effort not to keep the street clean.

Follow him in his various moods and occupations; study the women carrying heavy burdens on their heads, and walking with that peculiar gait so characteristic of them as a race.

Record them in their holiday attire; visit the "Bend" and the Italian quarters, and jot down a photographic impression of a motley crowd.

Note the children from their early appearance in tight bandages, which completely envelop them, through their gradual development as street gamins, boot-blacks, and fruit vendors, and you will have a set of pictures valuable and interesting, recording manners and customs in the only satisfactory way known to modern science.

Through their art we have learned the customs of many a bygone people, and our own some day will be recorded in a similar manner.

Extend your investigations through the various nationalities, classing each nation by itself, and you will find an added interest to your work, and a field that is almost limitless.

Do you want something more scientific? Try upon a certain brand of plates the effect that different colours have; place them side by side and in contrast, making equal exposures, and you will have learned much as to what not to try. Do this systematically, and then compare it with results obtained in the same way from the same subjects, but with the interposition of various colour screens.

Do you know exactly the difference in effect that your different stops give? Mathematically you know the difference in exposure, but have you ever tried the same length of exposure on a given subject, with a given light, substituting successively one stop for another till you have used them all? Try it once, and carefully compare the results. Then try the same subject with each stop, giving it the proper exposure; each time vary your subject, and by the time you have finished you will have learned more of stops and their effect than you ever dreamt of before.

Test your developers in a similar way. Vary their proportions, and try them on equal-length exposures of the same object. Keep your negatives and label them, and you will find few people to whom they are not of interest.

This is what we mean by systematic work. Work that has some object in it, and which, when performed, is something more than pretty. You have learned by it; your friends can also benefit by seeing your results in a way that volumes could not bring home to them.

Photography is worthy of being something more than a plaything; our clubs of being something else than print and slide collections, often of doubtful merit, and always without definite aim or object. Photography doesn't need such encouragement. It has got far beyond that. But it does need honest, painstaking, and, above all, systematic work, to keep it from degenerating into a mere plaything.

HIRING LANTERNS FROM PHOTOGRAPHIC SOCIETIES.

According to the Club and Dark-room bye-laws of the Bury Photographic and Arts Club, which we have just received, members of the Lantern Committee who may desire to hire the Society's lantern can do so, the charge for the lantern, ten-feet screen, cylinder, &c., and one lime, being 2*s.* for one night, and 1*s.* for each of the two following nights used; extra limes will be charged for. If it is desired to use oil with the lamps, the charge shall be 1*s.* 6*d.* for the first night used, and half-price the two following nights. Charge for the use of cylinder or screen 6*d.* each per night. No member shall have the use of the lantern, &c., for more than two successive nights, except on the written permission of the Secretary.

The following is the list of apparatus of the Club for hire:—Single lantern, complete with condenser, lens, carrier, blow-through jet, india-rubber tubing, &c. Four-wick oil lamp for the above. Ten-feet oxygen cylinder with coupling and key. Duplex oxygen regulator. Changing tent. Two magnesium wire reflectors. Ten-feet square screen with frame, in bag. Twenty-feet square screen with frame.

It appears to us that the example here set by the Bury Society might profitably be taken advantage of by other societies, who would thus have an opportunity—which is often much needed—for extending their sphere of usefulness.

LANTERN FIXTURES.

Lantern Nights at the Photographic Exhibition.

During the course of the Exhibition there will be displays by means of the Optical Lantern, every Monday, Wednesday, and Saturday evening, as below:—Monday, October 10, slides by Mr. W. England; Wednesday, October 12, by Mr. T. M. Brownrigg; Saturday, October 15, by Mr. H. Little; Monday, October 17, by Members of the Photographic Club; Wednesday, October 19, by Members of the Manchester Photographic Society; Saturday, October 22, by Members of the Newcastle Photographic Society; Monday, October 24, by Mr. A. R. Dresser, from photo-

graphs at the "Wild West Show;" Wednesday, October 26, by Members of the Convention; Saturday, October 29, by Members of the Birmingham Photographic Society; Monday, October 31, by Mr. E. G. Lee; Wednesday, November 2, Mr. E. G. Lee, Amateur Photographers' Field Club; Saturday, November 5, by Mr. Richard Keene; Monday, November 7, to be announced later on; Wednesday, November 9, by Mr. B. G. Wilkinson.

The management of the Photographic Society's lantern is as usual in the experienced hands of Mr. R. R. Beard.

October 10. Lantern Society.—American Slides.
" 11. Hackney Photographic Society.
" 18. Birmingham Photographic Society.—Prize Slides.
" 20. London and Provincial Photographic Association.—First Lantern Night and Competition Slides.
" 25. Birmingham Photographic Society.—Lantern-slide Making.

RECENT LANTERN PATENTS.

APPLICATIONS FOR PATENTS.

No. 16,474.—"Improvements in Magic Lanterns." W. Watson and F. Holmes.—*Dated September* 14, 1892.

Correspondence.

THE DANGERS OF OXYGEN-MAKING.

To the Editor.

Sir,—Seeing your notice that you will devote a special supplement to the Lantern and its working, perhaps my experience may be interesting to your readers, and may serve as a warning to all who make their own oxygen gas. Experience, I regret to say, that has left me broken down in health and spirit, and with marks that I shall take to the grave, all through a chemist's blunder. Being asked to illuminate some Tableaux Vivants by the aid of the Lantern, I sent to a photographic firm of chemists for six pounds of oxygen mixture, viz., four parts chlorate potash, two parts black oxide of manganese. The parcel came by parcel post, labelled oxygen mixture. I weighed out one and three-quarter pounds of the mixture, put it into the retort (a safety one), placed the retort on a small fire in my studio, and in less than one minute a fearful explosion occurred. The roof and side of my studio were blown to pieces, skin and flesh were burned off my left hand from the finger tips to the elbow; my right also. My face and throat were one mass of cuts, and my eyes were so terribly injured that the doctor thought I would be blind for life. The retort was made bits of, and twisted in all shapes. The bars of the fire grate were blown in all directions, and some entered in the cement wall opposite (eleven feet) to the depth of half-an-inch. The report was heard at a great distance. How I escaped Providence alone knows. I think I must have been in a stooping position, otherwise very likely I would not be alive to pen this letter.

After the explosion, blind and bleeding as I was, I made for one of the doors (there were two), and I succeeded in gaining the open air. A few seconds more and I am sure I should have been suffocated. The feeling was something fearful. The fumes given off were like so many sharp knives cutting the throat inside. I was quite exhausted the moment I reached the door, and fell.

I shall not dwell on my sufferings for the past three months; but to give you an idea, I was eleven stone weight, and when weighed by a high medical authority, to whom I went to consult about my health four weeks after the explosion, I only weighed eight stone eleven pounds. I had to undergo two operations for my eyes, and my right eye, I greatly fear, will never be the same again.

After the explosion I got the mixture analysed. I have four and a quarter pounds of it still. And what do you think this photographic firm of chemists sent me to make oxygen gas from? They sent me a mixture of chlorate of potash and *sulphide of antimony*, not a trace of manganese.

I do not mention the name of the firm as I am bringing an action against them, and my only reason for writing these particulars is that you may warn your readers to be careful if they make their own oxygen gas to get the proper mixture, and not get a *powerful explosive*, as in my case, which has left marks on me that I shall take to the grave.

Any further particulars I can give you you are welcome to.

Should you wish to inquire about the explosion, the police here can give you all information, as they were on the scene ten minutes after the occurrence, and, I believe, made a note of everything, and also the condition I was in.

Sincerely hoping that this letter may be the means of preventing similar accidents, and a warning to all.—I am, yours truly,

Thos. B. Walshe.

P.S.—I have all the pieces of the retort, bars of grate, &c., and shall be glad to send you a photograph of them should you wish it.

Rosscarbery, co. Cork, Ireland. Oct. 1, 1892.

[We should be pleased to see the photograph.—Ed.]

REFLECTORS—GASOLINE.

To the Editor.

Sir,—I shall be glad if you will tell me about the use of reflectors to throw the light from the lime when used *with its back* to the condensers and placed in the focus of the mirror. This is, of course, an unusual method, but has, I fancy, some advantages over the usual method. Further, I would ask for account of experiences with gasoline in an ordinary saturator.—I am, yours, &c., Haslemere.

September 26, 1892.

Lantern Notes and Queries.

C. R. B. (York).—The size of American lantern slides is $4 \times 3\frac{1}{4}$.

Simpleton.—You have not been misled. A whitewashed wall answers admirably as a screen.

"Supplement."—We shall doubtless have an article on the subject in the November supplement.

A. J.—Yes; amidol answers excellently for lantern slides. We have seen some charming slides developed with it.

V. E. Moore.—No; few people make their own oxygen nowadays. See a letter on the subject in another column.

Inventor.—Send us a description and drawing of the lantern, and we shall then be the better able to judge of its "novelty."

S. Peel.—Mr. Chadwick states the advantages of triple condensers in the course of his paper in another part of the Supplement.

F. Potter asks for the names of makers of "adjustable lantern stands."—Any lantern-dealer would be able to supply you with what you require.

Disc.—The length of the hall being twenty-five feet, you would require an objective of six inches focus in order to produce a disc of twelve feet in diameter.

Inquirer.—Messrs. Archer have one of their lanterns in the present exhibition of the Photographic Society at Pall Mall. By paying a visit to the Exhibition you would be able to examine it at your leisure.

B. Olivea.—The whiter the screen the better. If it is so discoloured as to degrade the lights of the picture, you had better have it repainted. Messrs. J. Avery & Co., of Great Portland-street, will undertake the matter.

Screen.—You are in error. Lantern slides on celluloid films may take the place of glass slides. Of course some sort of special carrier is necessary, and such a one is, we believe, to be obtained of Mr. J. D. England.

Mr. Alfred Underhill, of 32, Clarendon-road, West Croydon, has sent us his supplementary list of lantern slides for 1892-93. It includes many new series, and gives particulars of the various departments of Mr. Underhill's business, which embraces designing and drawing, slide colouring, &c.

To test a lantern objective for flatness of covering power, Mr. G. C. Norton employs a square of muslin netting mounted between two plates of glass three and a quarter inches square. This answers better than a photographic transparency in which there is often a falling off in definition towards the edges.

For the purpose of making tracings on glass of photographs to serve for lantern illustrations, Mr. Thomas Haddow, of Maitland-street, Edinburgh, has sent us a sample of an opaque black ink which flows freely from the pen. For extempore purposes during lectures this possesses certain advantages over writing ink, especially as regards opacity.

At a recent meeting of the Port Elizabeth Photographic Society, he development of a plate was shown on the screen by means of the lantern, and aroused very great interest among those present. This was stated to be the first occasion on which such an experiment was conducted in the town.

Catalogues Received.—Messrs. G. W. Wilson & Co., Aberdeen. This gives particulars of several additions to Messrs. Wilson's well-known series of slides.—Messrs. F. York & Son, 67, Lancaster-road, Notting Hill, W. In this supplementary list Messrs. York also include many novelties.

MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."] [*November* 4, 1892

THE LANTERN RECORD.

CONTENTS.

SOME DISADVANTAGES OF COMPRESSED HYDROGEN.

In most of the circumstances under which lantern entertainments are given a supply of house gas is usually available, and thus the provision of compressed hydrogen is unnecessary. Occasion, of course, often arises when a domestic source does not exist, so that recourse must be had to the assistance of the compresser. For this purpose both pure hydrogen and the carburretted variety are at command.

The advantages of pure hydrogen over the commoner form of gas are not on the whole of a very marked nature as regards the quality of the illumination given, which combined with the additional expense have sufficed to restrict its uses to a limited degree. Its purity, however, relieves it from one of the drawbacks of the ordinary gas, to which we are now about to advert, so that it is undoubtedly more reliable and agreeable to work.

Pure hydrogen, again, so far as we can ascertain, undergoes no chemical alteration, even though it be suffered to remain in the cylinder for an abnormal period. As much, however, according to the opinion of several experienced lanternists with whom we have been in communication on the subject, cannot be said of the ordinary hydrogen gas. The use of this within a reasonable period after the cylinder has left the compressers, say a few weeks, entails no convenience; but, if a period of months through unavoidable causes be allowed to elapse before the gas is required, the most unpleasant effects result in the working of the lantern.

An incrustation collects at the extremity of the hydrogen tube, which again is projected in the shape of dark flaky fragments upon the lime, thus reducing the light to a condition of low illuminating power and intermittent constancy, which is not restored to its normal degree of brightness until the gases are turned off and the offending fragments removed from the tube and the lime. Under such circumstances as these, it can well be imagined that an audience would be rather incommoded, and the operator chagrined, at the momentary failure.

The cause of this has been ascribed to some species of chemical reaction taking place between the hydrogen and the cylinder after a certain length of time, whereby minute fragments of oxidised metal are held in suspension in the gas, and subsequently converted into appreciable atoms, with the result described. How far this is correct we are unable to say. Perhaps those familiar with the compression of hydrogen can throw some light on the matter. Pending such an elucidation, however, the obvious course for the lanternist to take is to, where possible, use freshly compressed hydrogen in preference to that which may have been in the cylinder for, say, months.

LANTERN NOTES AND NEWS.

DURING the Stanley Show of Cycles, &c., which is to be held at the Agricultural Hall from November 18 to 26, there will be photo-cycle lantern entertainments, including the following subjects:—"The Evolution of the Cycle," with illustrations of all types of machines, from the Dandy Horse to the present-day Cycle; "From Ditton to Ripley in Thirty Minutes;" "The Great North Road," from London to York; "Cycling Celebrities;" "Our Cycling, Camps;" "The Path;" "Celebrated Starts and Finishes." The Hon. Lecturer will be Mr. George Lacy Hillier, of the Stanley Cycling Club.

* * * * *

AT the meeting of the Lantern Society on October 24, Commander Gladstone, the Hon. Secretary, showed a lantern of his own design, which, from the description given, appears to have many points of novelty about it. In its construction aluminium was used wherever practicable, and, instead of the metal-lined mahogany body, there was a cloth curtain lined with asbestos; the condenser mounted in aluminium was held between two thin plates of the same metal, and the slide carrier was held rigidly in position by means of an aluminium plate and two screws. The lens was mounted in a plain aluminium tube, and was carried by a small saddle, moving along the front board by means of a rack and pinion, and connected to the lantern body by a small camera bellows. For packing away, the whole thing folded up, and together with all the necessary fittings and two regulators stowed away in a box $18 \times 12 \times 5\frac{1}{2}$ in. The total weight, including the box and regulators, was about twenty-one pounds, the corresponding weight of the lantern which it has superseded being thirty-eight pounds. The space for the jet was practically the same as in an ordinary lantern, so that any jet, or an oil lamp, could be used with it.

* * * * *

THE Lantern Evenings of the Photographic Society of Great Britain have been, we gather, very popular this year. On the occasion when the slides contributed by the Photographic Club were exhibited we were pleased to notice a large and interested audience, who appeared to be highly delighted at the remarkably good qualities of the Club's slides, as well as with the terse humour of Mr. F. A. Bridge, who "described" them. Whatever else its critics may find fault with, the management of the lantern at the Society's meetings is difficult to excel.

* * * * *

BY the way, we may take this opportunity of reminding our readers that the Lantern Entertainment at the Photographic Society's Exhibition, in aid of the Photographers' Benevolent Association, takes place (by permission of the Council), at the Gallery, Pall Mall, on Friday evening, November 4th. Tickets, price sixpence each,

may be obtained of Mr. Snowden Ward, the Hon. Secretary, Memorial Buildings, E.C., or of any member of the Committee of the Benevolent Association.

* * * * *

For the evening in question a large number of tickets have already been issued, and doubtless sold, *apropos* of which a friend (and one, moreover, who, to our knowledge, has been a supporter of the Association for many years) has suggested that the benefit might in future be so arranged as to extend over three or four evenings instead of only one. The reason for this is that many hundreds of tickets are apparently being issued for one evening, and the room at Pall Mall has not anything like the accommodation necessary in case a large percentage of ticket-holders should put in an appearance.

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Mr. F. P. Cembrano, whose ability as an exponent of architectural photography is a matter of common recognition, laid stress the other evening, when speaking on the subject before the Photographic Society, on the value of the optical lantern for giving enlarged pictures of architectural subjects. Further, he dwelt upon the advantage of a large screen over a small one for showing off the slides to better advantage. We do not know whether the lantern is in requisition for this purpose by the professors of architecture at the various colleges and universities; but it can easily be seen how useful it would be in the lecture theatre, especially for acquainting the student with delicate details of architectural style on a convenient scale, which, as a rule, are only to be studied in comparatively minute drawings.

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The lantern was put to a somewhat novel use at the last meeting of the London and Provincial Association. A theory of Robert Hunt that red light overpowers or rather neutralises to some extent the actinic influence of white light on a sensitive surface having been recently quoted, it was suggested that the matter might very easily be put to experimental proof by means of the lantern. Accordingly, at the meeting in question, the experiment was tried in the following manner:—From the upper chamber of the biunial lantern three kinds of red light were projected on to a sensitive plate, affixed to a blackboard, the white light, much stopped down, emanating from the lower lantern. Three exposures were made, and the net results of the experiment went to negative the assumption that red light, such as is used for dark-room illumination, had any neutralising effect on the white light.

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A practical class on *Lantern Slides and Lantern Work* (by the dry-plate, wet-collodion, and collodion-emulsion processes) will be conducted by Mr. Charles W. Gamble, at the Polytechnic Institute, 309, Regent-street, on Wednesday evenings, commencing November 16, at eight p.m. This class includes copying illustrations from books, enlarging and reducing negatives, the use of the optical lantern, and all manipulative work connected with the lantern.

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A beautiful and instructive lecture experiment, illustrative of the conditions of the heated atmosphere which give rise to the mirage, is described by MM. J. Macé de Lépinay and A. Perot, in their "Etude du Mirage," which appears in the *Annales de Chimie et de Physique*. Water is poured into a long rectangular trough with glass sides, and covered with a layer of alcohol about 2 cm. thick, containing a trace of fluorescence. After a few hours, during which the alcohol diffuses slowly through the water, a flat beam of light is sent through the mixture at a very slight inclination to the horizon. Under these conditions a kind of garland of light is seen to traverse the liquid, due to a series of curvilinear deflections or "mirages" in the less highly refractive water below and total reflections at the upper surface of the alcohol.

A NOTE ON COLOURING LANTERN SLIDES.

The long winter evenings offer many opportunities for making lantern slides, when there is little else to photographically occupy the time, unless, it may be, printing and enlarging by artificial light in its various phases. But, to the greater number of amateurs, large work does not offer the attractions that work which can be performed in a limited space generally does. The ruling household powers, more often than not, look with anything but favour on the so-called "slopping about and making messes" entailed by working either large plates or paper. Consequently, lantern work (the "mess" being reduced to a minimum) is better tolerated.

There is, however, somewhat of monotony in plain slides, that may be occasionally varied with advantage. I allude to colouring. *Imprimis*, a badly coloured slide is, perhaps, one of the most offensive kinds of pictures that can be made; the large scale on which it is shown emphasises its shortcomings, and it has, without doubt, a commonplace, vulgar effect. Most persons unacquainted with the process of slide painting imagine that to do so *well* requires very considerable artistic ability and mastery over the material, even when the ordinary transparent colours are used. A certain amount of skill is required that may be too much for those not accustomed to water-colour painting. In the alternative method I now propose, such a very small modicum of painting ability is required that most of those who can take a photograph would be, with a little practice, equal to it, and obtain results that, considering the little trouble required, are decidedly satisfactory.

Procure an assortment of Judson's liquid dyes of suitable tints, a small quantity of spirits of wine, not methylated, and some camel-hair pencils, small paper stumps, and a piece of glass to do duty as a desk. I may here say it is of no use trying to mix the dyes like other colour in order to make certain tints, for one colour seems to destroy the other instead of forming a tint midway between the two. The dyes must therefore be used alone, diluted more or less with spirits of wine, and one tint allowed to dry before another is applied. The principal difficulty is in avoiding the thickening of colour at the edges of the stroke, but with a little practice this is easily overcome. Begin with the most delicate tints first, in a landscape the sky and water, finishing with the more pronounced colours. A drop or two of a suitably coloured dye being put into a small saucer, add sufficient spirit to dilute it to the proper tint, having at hand a little plain spirit into which the brush can be dipped as occasion may require; owing to the volatile nature of the medium, promptitude must be used to avoid waste, or the different tints may be kept diluted in small bottles.

Supposing we desire to tint a moonlight scene with good clouds, and bright reflections on the water; a cottage with the windows illuminated; or lanterns hanging to the rigging of ships. Firstly: take a small stump, dip it into a solution of wax in benzole, or suitable greasy matter, going over all parts carefully that have to remain colourless. The windows and lanterns having been tinted yellow or red, let these be waxed also; the slide then may be bodily immersed in weak greenish blue dye; blot off the edges, and dry. This will be probably all that is required to complete the picture. With a daylight view, tint the sky pale blue, softening off the colour towards the horizon with plain spirit, then carefully go over the landscape with suitable tints, always putting on the lightest and most delicate first, and drying before the application of the darker greens, &c. It is best to use but little colour, slightly tinted pictures having the best effect on the screen. Simple as this process is, excellent results may be obtained with little practice. Some colours are apt to dry duller than others. When this is the case a little gelatine solution poured over will restore the brilliance, care being taken to avoid dust in drying.

E. Dunmore.

LANTERN MEMS.

Lanternists will do well to remember that hydrogen cylinders must now have left-handed threads to the valves in order to be filled by the gas-compressing companies, and those who have not already had the change made will do well to have it done at once. Also their regulators for hydrogen to be made left-handed instead of right-handed as formerly.

* * * * * *

Cylinders containing hydrogen that has been laying by since last season should be tested, as the gas is liable to be impure, and, if so, will clog the jet in use, a chemical action taking place from the impurities of the carburetted hydrogen acting on the steel of cylinder. The best way is to fix tubing to jet and light up, putting on a lime as usual.

* * * * * *

The limes after a little use appear quite red or discoloured when impure hydrogen is used, and when this is so it is better to let the gas escape in the air, and send the cylinder up to be cleansed and refilled, a special mention being made of the fact when forwarding the cylinder to the optician.

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The samples of compressed hydrogen I have had occasion to use and

see tested during the last six months, have been of much purer quality than it used to be, and seems quite equal to being kept six months or so.

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Triple condensers are being taken up generally by the trade, and no doubt will be found useful for many purposes of projection. One form at least is made to separate so that the back lens can be removed, and a long-focus condenser is then available for long-focus lenses.

* * * * * *

Whether double or triple, the condenser must be of such a focus as will be suitable for the objective employed, and in practice one that is perfect for very short-focus front lenses, say of four and a half or five inches focus, or for microscope projection, will not be suitable for long-focus objectives of ten, twelve, or fourteen inches focus without separation or modification of the combination.

* * * * * *

Protecting glasses for condensers have been applied for years past in order to save the back lens from getting broken when the light has to be very near the same to get the correct focus; but, if I have read correctly an advertisement that appeared lately, a patent has been applied for for this application of a protecting glass to a condenser. Should it be so, it stands to reason that the patent cannot be valid.

* * * * * *

"Cut-off" dissolvers, "cut-offs" to jets, and screw-down valve taps to jets, are becoming popular, and seem to be appreciated. There is no doubt about the convenience of the former and its economy, while the latter are invaluable for regulating the supply of gas with the new high-pressure mixing jets, and, if fitted in the plug of the stop-cocks with lever handles as well, they answer a double purpose, viz., for fine regulation, and as a "cut-off."

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In using mixed-gas jets, the bye-pass tap on oxygen side of dissolver must always be turned off. Popping at jet is sometimes caused by this being turned on, accidentally or otherwise.

* * * * *

Mechanical figures, cut out of metal and articulated, will shortly be placed on the market. I saw recently some very cleverly made and arranged samples, in which subjects representing Gladstone chopping a tree, Gladstone and Salisbury wrestling, Ally Sloper rising from behind a table, bowing, and opening and closing the mouth as if speaking. The movements were so natural that one could almost suppose the muscles of the arms and legs of the wrestlers actually moved, and, with the wood-chopper, the axe not only rises and falls, but the body moves forward and up and down. Being opaque, the figures will be projected on the screen as silhouettes.

* * * * *

Leaky joints, from indiarubber getting loose or perished, are far more frequent than some suppose. It is wise every now and then to cut an inch or so off the end where it has *set* to the stretched size, and so get a new portion of the rubber for the connexion. With compressed gas, the tubes should be fastened on with string, wire, or, better still, a "grip" clip.

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From striking an average, I find that for a two hours' entertainment with a biunial lantern, the amount of gas used when employing best mixed-gas jets is seven feet of hydrogen and six feet of oxygen.

* * * * *

The old idea of the blow-through jet being the only "safety" one is gradually getting exploded, for, with the gases compressed in separate cylinders (and fitted with automatic regulators) the better kinds of mixed-gas jets can not only be used with perfect safety, but with greater convenience, and will give fifty per cent. more light. This form of limelight is adaptable for use in a very small space, and is, of course, quite independent of any gas-fittings, which is in itself a great saving of time when in a strange place.

G. R. Baker.

SOME NEW FEATURES IN CONNEXION WITH LIMELIGHT LECTURING.

The brilliant success which attended the course of lectures given in connexion with the Glasgow Photographic Exhibition held last year had, doubtless, much to do in the way of inciting the Council of the Fine Art Institute in Glasgow to lead off again this season with a five weeks' course of lectures given nightly, commencing September 1 and ending October 8.

This course embraced thirty-three lectures, and, with the exception of four, all the engagements were filled by amateurs, many of whom must have gone to considerable expense and trouble in getting up their lectures on new subjects especially for this occasion; and it must have been highly gratifying, not only to the Council of the Institute, but also to the Glasgow public, to find that, with one single exception (where the lecturer was confined to his bed through illness), the original programme was carried out almost in its entirety.

It is interesting to notice some of the features of this undertaking, and which, doubtless, helped in no small degree to bring about the success which attended it.

First and foremost must be noticed the very attractive programme which the Council offered to the public. It was as follows:—

Sept. 1st, Thurs.—"The Waterways of Holland." Mr. George E. Thompson.
2nd, Fri.—"The Volcanic Eifel and the Moselle." Mr. George E. Thompson.
3rd, Sat.—"Rambles along the Riviera." Mr. George E. Thompson.
5th, Mon.—"The South End of Arran, from Brodick Bay to Benan Head." Mr. William Lang, jun, F.C.S.
6th, Tues.—"Hogarthian Humour." Bailie John Ure Primrose.
7th, Wed.—"My Trip to India, *viâ* Suez." Major F. W. Allen.
8th, Thurs.—"Trip to London and Brighton." Mr. T. N. Armstrong.
9th, Fri.—"Greenland's Icy Mountains." Mr. John W. M'Call.
10th, Sat.—"Ireland and the Irish." Mr. John W. M'Call.
12th, Mon.—"Some Characteristics of Scottish Scenery." Professor John Young, M.D.
13th, Tues.—"Sir Walter's Land" (*with song accompaniment*). Mr. George G. Napier.
14th, Wed.—"Italian Highways and Byways." Mr. Frederick Clibborn.
15th, Thurs.—"Normandy." Mr. Frederick Clibborn.
16th, Fri.—"Among the Austrian Alps and the Carpathian Hills." Pastor Geyer.
17th, Sat.—"Glasgow in Ye Olden Time." Rev. Thomas Somerville, M.A.
19th, Mon.—"Brunswick and its Museum." Mr. James Paton, F.L.S.
20th, Tues.—"A Trip to Norway" (*with costumes and music*). Mr. W. G. Tait.
21st, Wed.—"To Ober-Ammergau and Back in 1890." Mr. W. Lamond Howie.
22nd, Thurs.—"Mary, Queen of Scots." Mr. George Mason.
23rd, Fri.—"Days at the Coast." Mr. A. Lindsay Miller.
24th, Sat.—"Edinburgh in 1826" (*with music*). Rev. William Brownlie, M.A.
26th, Mon.—"Guernsey and Sark." Mr. Robert Walker.
27th, Tues.—"My Visit to the Holy Land." Mr. T. D. Stockdale.
28th, Wed.—"Dr. Johnson in Scotland." Mr. Thomas Rennie.
29th, Thurs.—"Past and Present." Mr. F. H. Newbery.
30th, Fri.—"Iceland." Professor Mavor.
Oct. 1st, Sat.—"The Gold and Diamond Fields of South Africa" (*with musical accompaniment*). Mr. D. S. Salmond.
3rd, Mon.—"Scotland." Dr. Colville.
4th, Tues.—"A Caravan Tour." Mr. T. N. Armstrong.
5th, Wed.—"Our Great Composers and their Local Surroundings" (*with musical accompaniment*). Mr. James Aitken.
6th, Thurs.—"Marvellous Melbourne." Professor Wallace.
7th, Fri.—"Fashion in Dress." Mr. James Muir.
8th, Sat.—"Landscape in Art." Mr. James Paterson, R.S.W.

It will be observed that the above programme embraces very many new subjects, and further, in several cases, included some special features not generally hitherto combined with limelight lecturing. This was specially noticeable in the Norway lecture, when not only a very interesting series of pictures were shown by Mr. Tait, but he also introduced some of the native costumes, and likewise, with the aid of his lady friends, gave the large audience examples of Norwegian songs and instrumental music. The fair lady friends, who appeared in costume, gave a peculiarly *piquant* and bright effect to the whole lecture, which was greatly appreciated by the large audience. Then, again, in the lecture on Our Great Musical Composers, the rendering of the various examples of our great masters was exquisitely given by a quartette party, who assisted Mr. Aitken in no small degree to make what would have otherwise been a bald lecture more than interesting by the introduction of such high-class music so perfectly rendered.

In numerous other instances, as will be seen from the programme, music formed a very interesting item, going as it did, hand in hand with good pictures and instructive information.

In compiling such a programme, extending over five weeks, and which embraced no less than twenty-eight different gentlemen as lecturers, only two of whom, it may be said, were not locally connected, the Council doubtless had some trouble in the way of overcoming numerous scruples on the part of those who were not provided with lantern transparencies to illustrate their lectures; but even this was not permitted to stand in

the way of the rendering of what was known to be a good subject, and in all cases where lantern slides were not on hand the Council at once set about providing such for the occasion, and it was only by such action that many of the interesting subjects were arranged. Nothing was permitted to stand in the way of the scheme being made attractive. To this bold step doubtless must be attributed much of the success in compiling such a varied and interesting programme.

In scrutinising the list of lectures, we find that, out of the total of thirty-three delivered, exactly twenty of them were specially got up for this Course—a proof, if any were needed, of the enthusiastic spirit which animated those who took the undertaking in hand. Specially noticeable among the list of new productions must be noticed *Sir Walter's Land*, by Mr. Napier, and *Mary Queen of Scots*, by Mr George Mason. These gentlemen for months past must have been occupied in personally visiting and photographing the many interesting places in connexion with their subjects. Mr. Mason has succeeded in putting together an entirely new set of pictures, very many of which, such as Queen Mary's relics, are of more than ordinary interest, not only to the antiquarian, but also to the general public—a collection which, indeed, it will be impossible to duplicate, hence its value. I have said that in many cases where the lecturers were not provided with lantern slides to illustrate a subject that it was known they were competent to handle well, the Council of the Institute provided such for them. In this action they not only acted liberally, but set a good and wholesome example to those who hold the stupid opinion that every lecturer ought to show only his own slides, or, at least, such from his own negatives. Were such an absurd doctrine to become invariably the rule, there would be an almost insuperable barrier raised to the production of some of the best subjects by the very best men.

True, in one or two cases, the audience were treated to the gratuitous information that all the pictures shown were taken by the speaker for the time being, but such information failed to elicit any expression of approval on the part of the audience, and perhaps in a few cases, had such individuals substituted professional slides for their amateurish productions, the result would have been better. The opinion in Glasgow is decidedly gaining ground that all lecturers should strive to obtain the very best slides to illustrate their subject, no matter who takes them be they professional or amateur, and when such comes to be generally, followed, the result will be apparent by a very much higher degree of excellence in the pictures thrown upon the screen, and an entire absence of the ludicrous sight too often witnessed of seeing a gelatine slide melt before the audience. Many gentlemen who are able scholars and lecturers are not conversant with slide-making, therefore why should they be debarred by such a ridiculous idea? Others, again, who are able slide-makers cannot utter ten sentences on a platform before they give way at the knees.

When the idea of organising such a lengthy programme was first mooted, there were not wanting plenty of quidnuncs who shook their pates, "It would never do," "Far too many lectures," "Public would get tired of it," and many other similar expressions of disapproval; but the public did not tire of it, and the attendance increased steadily till the end, when only one feeling was expressed, and that was one of regret that such an intellectual source of amusement was to close.

The limelight arrangements were of the most perfect kind, and in the hands of Mr. More not a single hitch occurred from first to last. Visitors were much puzzled to understand how Mr. More took his cue from the various lecturers so as to change each picture with such unerring precision, there being no sign or sound noticeable; and yet, at the exact moment, the desired change was made with the utmost certainty.

Some very funny opinions were expressed as to how this excellent mode of working was accomplished. One well-known face in photographic circles declared that Mr. More, for the time being, was an animated pincushion, and that by some means or other a needle was thrust into a fleshy part of his body when he was to change a slide. Others watched night after night in the fond hope of being able to solve the mystery. All were disappointed.

The method adopted is the joint invention of the subscriber and Mr. More, and is absolutely silent and certain in its action; in fact, being almost startlingly novel in its working when rapid changes have to be made.

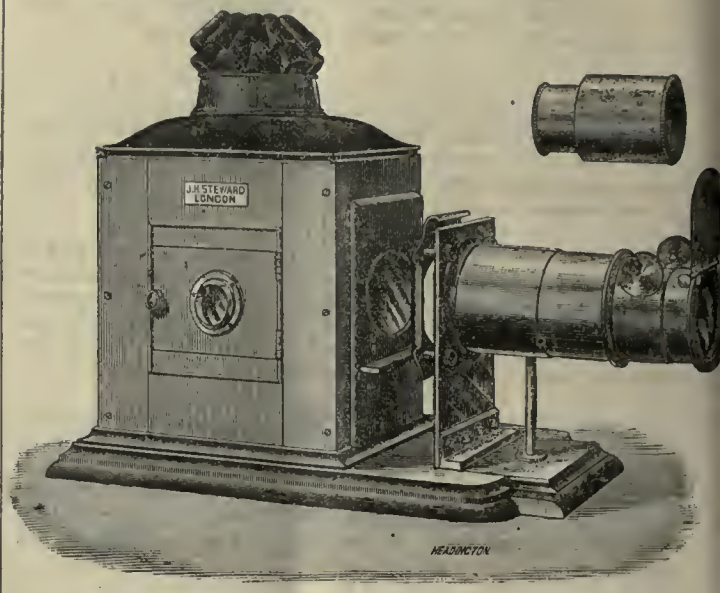
The ridiculous practice of using a crick-crick or castanet will never be seen in Glasgow again where first class lectures are given, and it is quite within the range of possibility, that before long the same action, which has now been introduced for the first time at these lectures, may be so extended as to permit of the lecturer actually changing his own pictures on the screen by the mere touch of a tiny button placed on the reading-desk.

It is more than likely that the Fine Art Institute will arrange for a similar course next year.

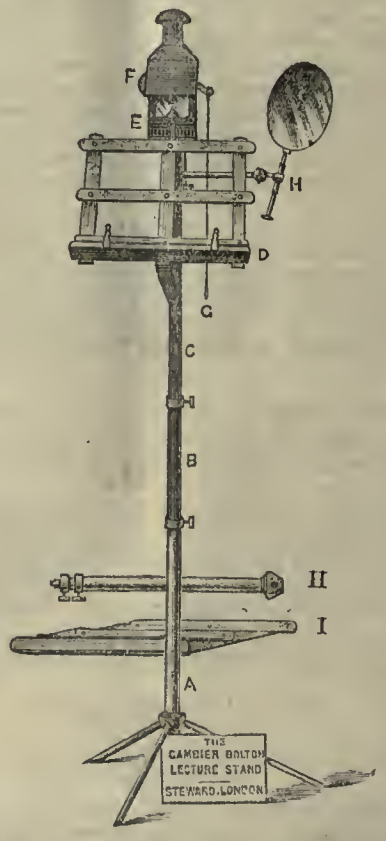
T. N. Armstrong.

SOME RECENT NOVELTIES IN LANTERN APPARATUS.

Concurrently with the commencement of the season, Mr. J. H. Steward, of 406 Strand, is introducing various novelties connected with the lantern and its accessories. Among these is a single lantern suitable for large halls, &c. Its distinguishing feature is that it is fitted with a solid tube



of large diameter, which is made a suitable length for the focus of the three-inch diameter lenses, with which the lantern is fitted, any further adjustmen being made by the rack and pinion jacket. If lenses of shorter focus are used, they are mounted complete in tubes of suitable length so that they push home to their focus.

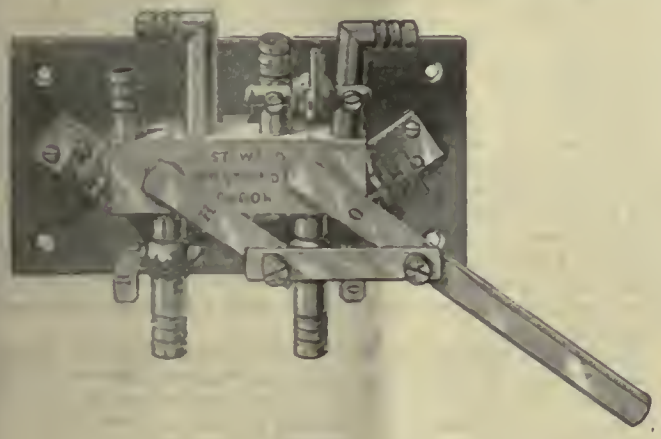


A bellows fronted lantern of the same firm has been designed to do all the regular work of an optical lantern for projection, and also to answer the purpose of a photographic enlarging lantern.

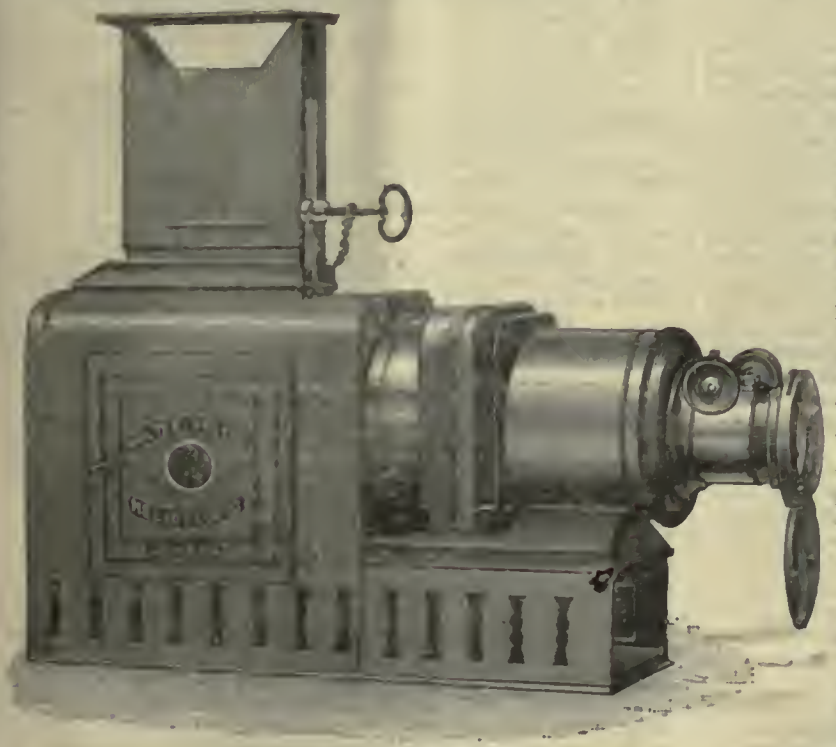
Mr. Steward is also introducing Mr. Gambier Bolton's portable lecturers' reading-desk, for enabling a lecturer to see the pictures shown on

the screen when his back is turned to it. The stand is composed of brass tubing made telescopic with clamps, and the three legs form a tripod at the base of this pillar, and pack inside the pillar for travelling. The mirror attachment, with ball and socket fittings, is to show the lecturer without turning his head what picture is on the screen. H shows the pillar closed up with the tripod legs inside; I shows the desk folded up.

In the "double plug" dissolver the gases pass through separate plugs from the supply pipes O and H, and then divide so as to conduct the gas to the two lanterns. The amount of bye-pass for the hydrogen flame is



regulated to a nicety by the screws and locking-nuts attached to the elbow-piece on the plate at the right and left of the plug-box, while a tap permits of the oxygen bye-pass being regulated if desired. The taps on the supply pipes can be partially or wholly turned off, and thus the apparatus or jets may be kept just burning or at once put out.



"The lantern season has commenced!" These were the words that sounded in our ears, issuing from the lips of Mr. Walter Tyler, on the occasion of a recent visit to his establishment in the Waterloo Bridge-road, London. Not only was this statement fully borne out by a cursory inspection of the activity which appeared to prevail among what may be termed the purely administrative sections of his business, but it received, perhaps, more cogent confirmation in other departments. Indeed, after a rapid inspection of the varied stock of lanterns and accessories, the famous lantern slide library, in which Mr. Tyler has gathered together possibly as large and diversified a collection of slides as are to be found in London or elsewhere; the stacks of gas bottles, charged and uncharged, the number of which the amateur, and maybe the professional lanternist, has no conception—in short, to witness the several branches of such a business as this in active operation, it is impossible to withhold the conviction, that whatever the fate of other divisions of photography may be during the present season, the section associated with the optica lantern is, especially at the present moment, undoubtedly in "full swing."

Among his latest novelties Mr. Tyler enumerates an electric lantern, such as, we believe, has been employed for projecting a picture of twenty-four feet in diameter on the drop-curtain of the recently opened Trafalgar Square Theatre. In appearance it resembles an ordinary single lantern, but it is asbestos lined, and the illuminant is an electric arc light. The focussing adjustment is actuated by a lever, which reaches from the objective to the rear of the lantern.

The features of the Helioscopic lantern, which, we gather, is in considerable request, are that it burns paraffin or any mineral oil, while the limelight can also be used with it. The body is of Russian iron, and it has solid brass fronts. It is fitted with Stock's lamp, and it is claimed that the objective employed is possessed of great flatness of field. Of the neatness and portability of the Helioscope there is no question.

Mr. Tyler showed us a very handsome single lantern intended for use in a neighbouring church, incidentally to which we had opportunities of observing to what an enormous extent the lantern figures in modern church work, by an inspection of his order-sheets for a couple of days. Undoubtedly a very respectable volume on the civilising influences of the optical lantern might be compiled.

Messrs. Archer & Sons, of Liverpool, are fitting their Ideal single lantern, which we noticed on the occasion of its introduction last year, with a new form of their Ideal dissolver. This is now made in a stronger form, while the fan is made to clear the lens a little more effectively.

OPTICAL PROJECTION.

[Royal Institution Lecture.]

The intention of this lecture is to give a general survey of the subject of Optical Projection, which now takes its position in science, and to present examples of what may be done by this method. It would be difficult to determine which subject claims a first place. Some scientists say the microscope should have the preference, while others take a different view. For my own part, I think the microscope and polariscope stand foremost, on account of the facility with which these branches of science may be pursued for the benefit of a large number, without multiplying expensive apparatus; also because of the convenience in saving the eyes from undue strain. Indeed, to many persons, looking at objects in the table microscope is little short of a painful operation, and consequently the study of small objects becomes to them impossible. The projection method immediately brings the required relief.

For general instruction, projection methods are invaluable, such as, for instance, showing diagrams, photographs, and other slides, upon the screen; as well as for spectrum analysis. In fact, the subjects which can be illustrated by means of optical projection are innumerable; but time will allow me to present only a few examples, and I trust that, when I approach the end of my lecture, my view of the importance of this subject will be held in equal estimation by you.

Probably the only people in the world that benefit by the experience of their predecessors are those who pursue the study of science. They are free from the accusation of robbing the brains of other men, when they take up methods or apparatus already known and improve upon them or employ them for their own work. In such cases, however, it is always understood that honour should be given where honour is due, and accordingly I have no wish to represent to you any piece of apparatus as of my own devising, which in reality belongs to another.

Few men have had a larger experience, and attained greater success in optical projection, than has Mr. Lewis Wright, who has embodied in his most recent forms of apparatus all that was good in designs existing unti

his time. I have, therefore, started from his models, making such modifications as I thought to be desirable. Mr. Wright does not appear —if I may say so—to have had much experience with the electric arc light as a radiant, and I found, at a very early stage, that great difficulties had to be encountered when this light was used, chiefly because the radiant approaches more nearly to what theory requires. That which was easy with the limelight became almost impossible with the arc lamp, and these difficulties had to be conquered.

Many scientific men are dissatisfied with the projection microscope, on the ground that very high magnification does not give that resolution and that sharpness which is found in the usual methods of observation. This want I fully admit. At the same time it is scarcely right to condemn a particular method because you try to apply it to an unsuitable purpose. Hundreds of thousands of subjects may be shown with the projection microscope with far greater profit to the student than was possible in the old way. The very fact that the professor can place his pointer upon any part of the picture on the screen is invaluable to the students. I shall, therefore, attempt to show you only a series of microscopical subjects suitable for projection, and shall not employ very high magnification.

In regard to some substances very high powers may be used with advantage, but much time would be lost in getting them into the field and focussing them upon the screen. These, consequently, I omit, so that a large number of subjects may be illustrated.

It is fair to state that most of the apparatus used to-night has been constructed by Messrs. Newton, of Fleet-street, and the luminous pointer by Messrs. Steward, of the Strand. The arc lamp is a Brockie's projector. Messrs. Baker, Watson, and others have also come to my assistance.

I will first show, on the screen, a picture of the lantern carrying its various apparatus; and then a few systems of lenses, which may be employed for the projection microscope, as well as a diagram of the microscope itself.

Sub-stage condensers and objectives are, as a rule, made to suit the table microscope. When projecting, by means of an objective alone, in consequence of the screen distance being very great—or, in other words, the microscope tube being exceedingly long as compared with the table instrument—the objective has to be approached very close to the slide; in fact, with the higher powers, closer than the cover-glass will allow. This close-working distance renders necessary special sub-stage condensers, and in many cases a special one is required for every screen distance with each objective. This requisite would seem to be a complete stumbling-block to microscope projection work. With the limelight the difficulties do not enter in the same degree as with the arc light, and as we are now dealing with the latter, further reference need not be made to the oxy-hydrogen light. There are two ways of surmounting the difficulty; one by the use of plano-concave lenses, introduced in such a way as to be equivalent to greatly lengthening the focus of the objective on the screen side, while it enables, as a consequence, the objective to be slightly further removed from the slide, *i.e.*, giving what is termed a greater working distance. The objection to this method is that, even when these plano-concave lenses are corrected, the result, though greatly improved, is not perfect. The second way, which is a perfect one, is that of introducing an eyepiece. In both these methods, that the best results may be obtained the objective is made to occupy a position not very different from that which it would do if employed on the table microscope.

In the eyepiece method almost the exact conditions can be complied with for which the objective was made. I propose, therefore, to show the subjects by the eyepiece method. The only objectives which will be used are: (1) Zeiss's 35 millimetre projection objective, the sub-stage condenser, 4 inches focal length, placed a considerable distance from the slide; (2) Newton's 1-inch projection objective, the sub-stage condenser as in the first case; and (3) Zeiss's ¼-inch achromatic objective, the sub-stage condenser being Professor Abbé's three-lens condenser with the front lens removed. In all three cases the eyepieces used are Zeiss Huyghen's No. 2 and No. 3.

In each instance I will mention the magnification in diameters, as well as the number of times when reckoned by area, for the appreciation of those who estimate by area; and I will also give the size to which a penny postage stamp would be increased, supposing it to be made of indiarubber, and stretchable to any extent in all directions. In presenting these figures I do not pretend that they are absolutely correct, but as they have been ascertained under conditions similar to those now existing the errors will not be very great.

In consequence of the field not being quite flat, and the sections having a certain thickness, although extremely thin in most cases, the whole of the object cannot be in focus upon the screen at the same time. By shifting the focussing screw slightly all parts may be brought into focus successively. So-called greater depth of focus is obtained by using an increased working distance; and for projection work over-correction for flatness can alone give a sharp picture all over with very considerable depth of focus; the difficulty of over-correction being that, unless extreme care is taken, certain forms of distortion may be introduced. By stopping down the objective greater flatness of field may be secured, but at the expense of light. There is thus a choice of difficulties, and the least one should be taken.

Turning now to the polariscope. Polarised light teaches us a great deal concerning the structure of matter; it is also a means of confirming the undulatory theory of light. This subject is so large that no attempt can be made to give even a general idea of the field it covers, and the experiments, which will be shown in the polariscope, may be taken simply as a few illustrations of the subject and nothing more; but they will, at any rate, be suggestive of the large field to which this method of analysis can be applied. A vast amount of mathematical proof can be illustrated graphically by various experiments with polarised light. I will show on the screen a diagram of the polariscope. (Shown.)

With reference to showing the spectrum. The method of projecting a spectrum, I think, is new, as I have not seen it described anywhere. It gives practically a direct spectrum with an ordinary prism, without turning the lantern round to an angle with the screen; and here is a diagram of the method.

The details of the apparatus, as well as those of the methods of working I have modified in almost every instance, for five reasons:—(1) That more certain results may be ensured; (2) that rapidity may be obtained; (3) that only one operator may be needed; (4) that, as far as possible, all parts of the apparatus may be interchangeable; and (5) that loose screws and pieces may be dispensed with.

There were then shown by projection a number of slides illustrating various microscopic optical systems, and a number of microscopic slides, followed by a series of general polariscopic projections, some of them to illustrate the strains existing in many forms of matter; also a spectrum by a carbon-disulphide prism, in conjunction with a reflecting prism and with a mirror, which, apart from any other result, demonstrates that the loss of light with a reflecting prism is less than with an ordinary glass mirror. Slides and other projections were also thrown upon the screen.

The details are as follows:—

The Microscope.—Screen distance, 21 feet. First 35 millimetres Zeiss projection objective, 4-inch sub-stage condenser, Zeiss Huyghen's eyepiece 2; 500 diameters = 250,000 times = penny stamp stretched to cover about 147 square yards. Subjects shown: proboscis of blowfly; permanent molar displacing milk-tooth (kitten); human scalp, vertical; human scalp, surface; fossil ammonites and belemnite. Second, 1-inch Newton projection objective, 4-inch sub-stage condenser, Zeiss Huyghen's eyepiece 2; 1000 diameters = 1,000,000 times = stamp stretched to about 588 square yards. Objects shown: proboscis of blowfly; foot of a caterpillar; section of human skin, showing the sweat ducts; phylloxera vastatrix of the vine. Third, 1-inch Newton's projection objective, 4-inch sub-stage condenser, Zeiss Huyghen's eyepiece 3; 1300 diameters = 1,690,000 times = stamp stretched to about one-fifth of an acre. Slides shown: proboscis of blowfly; wings of bee (showing hooklets and ridge); sting of bee (showing the two stings, sheath, and poison sack); sting of wasp (showing same as last slide); eye of beetle (showing the facets). Fourth, ¼-inch Zeiss's achromatic objective; Abbé's 3-lens sub-stage condenser, with top lens removed; Zeiss Huyghen's eyepiece 3; 4500 diameters = 20,250,000 times = stamp extended to nearly 2½ acres. Slides shown: proboscis of blowfly; hair of reindeer (showing cell structure); hair of Indian bat (showing the peculiar funnel-like structure); sting of bee (showing the barbs); foot of spider; stage of the micrometer (the closest lines ruled to thousandth of an inch, which measure 4½ inches apart under this magnification); a wave length $\frac{1}{40000}$-inch, therefore, on screen measures about $\frac{1}{9}$-inch.

The Polariscope.—Shown with parallel light; plain glass; glass under pressure; chilled glass (round, oval, and waved peripheries); Prince Rubert's drop (broken in the field); horn; selenites (over-lapped); butterfly (selenite); bunch of grapes (selenite); bi-quartz, with ¼-wave plate (the ¼-wave plate in this experiment produces the same effect upon the bi-quartz as if a column, 20 centimetres long, of a 7½ per cent. solution of cane sugar were placed between the polarising nicol and the bi-quartz (the analyser has to be rotated about 10°); a piece of sapphire to show asterism. Shown with convergent light; hemitrope (cut in a plane, not at right angles to the axis); ruby; topaz; grape sugar (diabetic); cane sugar; quartz; superposed right and left-handed quartz (spirals); calcite

and phenakite superposed (showing transition from negative to positive crystal, passing through the apopholite stage).

The Solidiscope.—New form of apparatus for showing solids, and consisting of two reflecting prisms and suitable projecting lenses. With this instrument were shown:—Barton's button, the works of a watch, a coin.

Spectrum Analysis.—Spectrum thrown by means of a disulphide prism combined with a reflective prism; the result being that a good spectrum is thrown upon the screen direct without turning the lantern. There were shown:—The spectrum; absorption bands of chlorophyll, &c.; effects produced by passing the light through coloured gelatine films.

Protection of Slides.—Decomposition of water; expansion of a wire by means of heat; combination of colours to form white light; various diagrams, coloured photographs of a workshop, &c. As an extra experiment there was shown, in the polariscope, with a convergent light, Mitscherlisch's experiment (illustrating the changes which take place in selenite under the influence of heat).

There are but few who would disagree with me in the opinion that the microscopic world, as regards its design and its molecular structure, is quite as wonderful as the great works around us seen with the unaided eye. A magnifying glass of low power opens up a world far larger than that which we are accustomed to see. At the present time, even with the most perfect apparatus that exists, only a small portion of the universe is known to us.

Scientific study should be pursued by all in a greater or less degree. It teaches more important lessons than the most impressive discourse ever preached. During the investigation of what is generally termed the invisible world, men should at times pause to reflect, and ask themselves such questions as these: What is the meaning of, and to what end is, creation? Is it all mere chance? Were such wonderful designs and properties created at the beginning? Was there in matter at the beginning an inherent, or implanted, power of development? Simple as these questions may seem, man in the flesh will never be able to find the true answers. The extraordinary design and structure which have existed in the unseen world for millions of years, or possibly in all past time, and even at the present day known to so few, demonstate at least that the great Power has bestowed the same care upon what appear to us the most insignificant portions of creation, as upon what we think are the greatest works in the universe. These silent sermons must surely influence the mind, and set it thinking of the supernatural and of our duties during life.

It may now with truth be said that science gives us means, such as never before existed, of appreciating the greatness of the Supreme Spirit, by enabling us to read fresh chapters in the book of nature.

SIR DAVID L. SALOMONS.

ADVANTAGES OF A NATIONAL LANTERN SOCIETY.

[*American Amateur Photographer.*]

In the workings of the American Lantern Slide Interchange there has developed a desire among amateurs not belonging to clubs to enjoy some of the advantages of the interchange, it being suggested that they have the privilege of paying a stipulated amount for the use of sets of slides; but, as the present interchange is a confederation of clubs, there is no provision for the use of its slides by individual amateurs.

We think if a lantern society, national in character, was organized, having certain centres for the storing of sets of slides, lanterns, and screens, arranged with suitably prepared lectures, that could be loaned for a moderate sum to members, a most interesting branch of photography would be popularised. It would enable many amateurs, who only wish to give lantern entertainments at long intervals, to secure the use of a first-class apparatus at a small sum, and avoid the expense necessary in purchasing a good lantern and its accompanying equipments. Such a society would have the best apparatus for oil or gas, and make a point to see that it was always in good order. In addition to the apparatus there would eventually be a fine varied collection of slides to draw upon, as it could be made a condition of membership that each member would be required to furnish a certain number of slides each year.

We shall be pleased to hear from our readers interested in slide work on this subject. We believe such a society would become very useful. A similar organization in London, "The Lantern Society of London," has sent to the American Lantern Slide Interchange one of the best sets of English slides ever seen here. There, members of the Society having sets of slides loan them to the Society for the use of other members, and are entitled to the use of other sets belonging to the Society. A member loaning a private collection of slides has the privilege of withdrawing it at any time from the Society by giving a month's notice. Members who do not contribute or donate slides to the Society are obliged to pay twelve cents for each dozen, or part of a dozen, they borrow for exhibition purposes, and fines are provided for in case a set of slides is kept beyond a certain time. The special object of the Society is to acquire suitable apparatus, for the purpose of giving exhibitions of general and scientific interest; to offer awards for the development of the optical lantern and apparatus pertaining thereto; to impart instruction in the use of the lantern and its apparatus; to secure for its members special advantages in the purchase and loan of apparatus and slides; to originate a large and comprehensive loan collection of lantern slides illustrative of art, science, and kindred subjects, such collection to be placed at the disposal of every member of the Society; to provide means of intercommunication between members for the promotion of the interchange of private collections of slides; to collect and impart to such members as desire it information as to the means of obtaining permission to photograph in the various public museums and collections.

Special branches of photographic work undoubtedly demand special organizations to thoroughly promote them, and for this reason a lantern society would appropriately meet the wants of those interested in slide-making and lantern work.

RECENT LANTERN PATENTS.

APPLICATIONS FOR PATENTS.

No. 19,121.—"Improvements in Optical Lanterns." A. J. JONES and S. J. LEVI.—*Dated October* 25, 1892.

No. 19,314.—"Improvements in Screens for Magic Lanterns or Optical lanterns." W. MARSHALL.—*Dated October* 27, 1892.

PATENT COMPLETED.

IMPROVEMENTS IN BOXES OR CASES FOR MAGIC LANTERNS.

No. 14,995. HERBERT CHARLES NEWTON, 3, Fleet-street, London, E.C. —*September* 24, 1892.

IT is usual for the makers of optical lanterns to provide a box or case in which the lantern can be transported from place to place, which case is employed as a stand for the lantern when in use.

The case has generally been arranged so that one or both sides should let down to act as a table on which to place the slides, the sides being supported by tapes or chains.

But this has been found inconvenient, as the table takes up too much space and prevents free access to the lantern, and the chains or tapes are in the way when exhibiting, besides which, if both sides are let down, the framework of case has to be stronger and heavier than is absolutely necessary.

It has also been found desirable to have a tilting-board, so that the lantern may be more or less tilted without moving and wedging up the case; but the addition of a tilting-board adds weight to the case, which is undesirable.

Now, the object of the present invention is so to construct a case for optical lanterns that the above requirements will be provided for, and, at the same time, the weight will be reduced to the minimum.

The claims are:—1. A box or case for optical lanterns, constructed and arranged substantially as described. 2. In a box or case for optical lanterns, adapting one side to form a shelf supported at or about half the height of the box in guides, and part of the other side to form a tilting-board, as described.

Exchange Column.

Wanted, lantern screen and stretcher about twelve feet, also mechanical slides in exchange for good burnisher and large printing frame.—Address, W. COLES, 60, Queen's-road, Watford.

Correspondence.

THE PURITY OF OXYGEN.

To the EDITOR.

SIR,—As an old subscriber and occasional contributor during the last thirty years, I beg to congratulate you on your enterprising movement, re "Lantern" issue in connexion with THE BRITISH JOURNAL OF PHOTOGRAPHY, and I feel sure it will be greatly appreciated by your numerous readers.

Now there is an important matter in connexion with the "Lantern" which I should like to place before your readers at the early part of the coming winter season, viz., the purity of oxygen as supplied by the different companies in cylinders, in comparison with home-made gas, by the process usually adopted with chlorate potash and manganese.

As an old hand, and much experience, I must say I rarely get so good a light with the gas supplied in cylinders as I do with the old method and gas bag, not that the bag has anything to do with it. I find that, if the gas is kept (cylinders), it rapidly deteriorates, and is little more than atmospheric air; if that is so, undoubtedly it will be the same if stored in the company's gasometers, which will account for the gas not being always of the same quality.

Last evening (as an instance), I used a twenty-foot cylinder of oxygen which had been used on two previous occasions, filled about two months ago; the light was very poor; this was nothing new, as I have experienced the same result before; there was plenty of pressure, and gases carefully adjusted; a six-foot bag was filled from the cylinder, after the use of it was over, before sending it to be refilled. I offer no explanation myself, but hope this communication will be the means of calling attention to the matter, and useful discussion be the result.

The above applies chiefly to the blow-through jet. As yet there are no reports of burst cylinders, I think, but as there is certainly a change takes place in the quality of the gas when kept long in the cylinder, may there not be a corrosive influence at work, which will eventually weaken the cylinder?

I was very sorry to see the report in "Lantern" issue of the retort accident, which the simplest of precautions would have prevented. Trusting the different companies will not think I am disparaging their gas, as I am only opening the matter for discussion, as an interesting subject.—I am, yours, &c., FREDERICK BAILEY.

October 26, 1892.

THE CHARITABLE LANTERN ENTERTAINMENT SOCIETY.

To the EDITOR.

SIR,—The above Society, the objects of which are to provide free lantern entertainments to charities and hospitals, has now been formed, and we shall be pleased to secure the names of gentlemen wishing to join.

We shall be grateful for any help, also gifts of any apparatus and sides.—We are, yours, &c., B. FOULKES WINKS, F. SIMMONS, } *Secretaries.*

Y. M. C. A., 182, *Aldersgate-street, E.C.*

Lantern Notes and Queries.

AMOS.—Yes; oxygen is "poisonous" in so far as by itself it will not support life.

T. R. P. (Kensington).—This correspondent asks us for particulars of the National Lantern Society. We never heard of such an organization.

F. BROMHEAD (Clifton).—Messrs. George Gill & Sons, of 13 Warwick Lane, E.C., are now the proprietors of Messrs. Mason & Payne's opaque lantern screens.

G. T. R.—The total elimination of the smell of oil lamps is difficult to accomplish. In Stock's and others, however, it is so minimised as to be not very noticeable.

THOS. B. WALSHE.—Our correspondent sends us a photograph of the remains of the oxygen retort which, as described by himself last month, exploded with such unpleasant consequences.

S. WALES.—Commander Gladstone, at the last meeting of the Lantern Society, exhibited a lantern of which several parts were constructed of aluminium. See a reference to the subject under *Lantern Notes and News.*

V. NIXON (Portsea).—Undoubtedly; there are lanterns in the market which can be used for either "optical projection or for enlarging." They are usually made with bellows fronts in order to serve the double purpose.

NOVICE (Herne Hill).—No; it is not our intention to inaugurate lantern-slide competitions in connexion with this SUPPLEMENT. Such and similar competitions fall more appropriately within the sphere of photographic societies.

A. WILLS (Colchester).—The principal objection to the use of a lens of the rapid doublet type as a lantern objective is that, working as it does at (for the purpose) the comparatively small aperture of *f*-8, it would cut off too much light.

HYDROGEN.—No, we do not think any very appreciable advantage accrues in practice from the use of pure hydrogen. Common house gas contains one or more hydro-carbons, upon which its power of illumination depends to a large extent.

E. C. RICH.—The Brin Company, we believe, submit their cylinders to a periodical test. Although we have not the exact data by us, this test implies a degree of pressure such as the cylinders are not likely to be subjected to when charged with oxygen for use.

J. E. RIDDALL says: "Kindly inform me, through the medium of your paper, as to whether a gas incandescent light would be suitable for an ordinary optical oil lantern, as limelight is too expensive and complicated."—Yes; but the flame should not be too large.

OPERATOR says: "Is a blow-through jet likely to work well with the oxygen tube recessed three-eighths of an inch? It is then above the hydrogen inlet. The hydrogen aperture is three-sixteenths of an inch."—We see no objection to such a form of blow-through jet.

BI-CONCAVE.—From the fact that the image on the screen is only critically sharp in the centre, while the remainder is slightly fuzzy, it is apparent that the lens suffers from roundness of field. This is not, as you seem to fancy, the same thing as inferior covering power.

W. RAYE.—The smell which you say is "insufferable" may possibly be obviated by attending to the directions given by Mr. Frank Howard at page 670 of the JOURNAL for October 14. That method is simply never to leave any oil in the reservoir or wicks when the lantern is not in use.

LANTERNA (Maldon, Essex).—The light given by Mr. E. J. Humphery's magnesio-oxygen lamp would scarcely be suitable for projection purposes; and clearly the enormous quantity of powder it would consume in the course of an hour or so puts it out of court on the score of expense.

QUESTIONER (Erith).—Any of the hand cameras extant will serve your purpose but procuring negatives for making lantern slides from; but if, to quote your question, you "want a hand camera which takes films of the size of lantern plates," then is that condition fulfilled in the "Frena" hand camera of Messrs. Beck, which takes films $3\frac{1}{4} \times 3\frac{1}{4}$.

JAMES SYME writes: "Is the aero-carbon light, which I saw mentioned several times in the BRITISH JOURNAL OF PHOTOGRAPHY last winter, being used as a lantern illuminant?"—We do not know, but from what we saw of it, and from the opinion generally expressed of it it is possible that it would form a good substitute for the limelight.

LANTERN FIXTURES.

NOVEMBER 7. South London Photographic Society.
" 7. Richmond Photographic Society.
" 8. Birmingham Photographic Society.
" 10. Hexham Photographic Society.—Lantern Evening.
" 14. Newcastle Photographic Society.—Exhibition of Slides by Eminent Photographers.
" 16. Manchester Photographic Society.
" 17. London and Provincial Photographic Association.
" 18. Preston Photographic Society.—Prize Slides.
" 21. Richmond Photographic Society.—*Different Lantern Slide Processes*, Mr. Andrew Pringle.
" 21. Croydon Camera Club.
" 23. Coventry Photographic Society.—Prize Slides.
" 24. Louth Photographic Society.
" 26. Hackney Photographic Society.
" 29. Birmingham Photographic Society.—*Lantern Slide Making*, Mr. E. Howard Jacques.
" 30. Photographic Club.

MONS. F. M. RICHARD, of Paris, who recently exhibited the *Photo-Jumelle* before the members of the London and Provincial Photographic Association, desires us to notice the circumstance that the Chairman of the meeting in question (Mr. W. E. Debenham) thought the size of the plates or films used in the *Photo Jumelle* (see page 684, BRITISH JOURNAL OF PHOTOGRAPHY for October 21) suitable for lantern slides. We herewith accede to M. Richard's request.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*December* 2, 1892.

THE LANTERN RECORD.

CONTENTS.

THE LANTERN IN PHOTOGRAPHIC DEMONSTRATIONS.

That the optical lantern commands a growing popularity among photographers is a trite enough phrase, which we should scarcely care to employ here, did it not enable us to contrast the extent of its uses in societies and among individuals for the projection of lantern slides of purely pictorial interest, with the comparative desuetude under which it rests for the purposes of conveying information of a more practical nature. It is true that as an illustrative aid much advantage is taken of the lantern, but this is chiefly in a subjective rather than an objective manner. In addition to its utility for entertainment purposes, it is, of course, often employed as a means of imparting information on photographic matters, although not so frequently as one might.

Many points of practical photographic interest about which a great deal is said at Society meetings might possibly be brought home more clearly and forcibly to an audience by being objectively shown in the lantern. No subject in photography is more discussed than the development of the photographic image in its various aspects. Those aspects—such, for example, as the appearances of over or under-exposure—might conceivably be illustrated in the lantern with especial advantage to beginners and young photographers, and, may be, to older ones, for it is universally admitted that a brief object lesson is infinitely more calculated to impart reliable knowledge to the student than a great deal of verbal exposition unaccompanied by a practical demonstration.

Development on the screen is an old experiment, but an always interesting one, and from its occasionally cropping up here and there among the Societies we can also conjecture that it is of an instructive kind. A correspondent writes us this week asking how the experiment is conducted, and, in the hope that the information may be of service to other beginners, we include it in this article. No operation is more easily managed. Upon the stage of the lantern a trough of suitable size is placed, having in contact with its side nearer to the illuminant, a sheet of non-actinic ruby glass, the effect of this being to project a red disc upon the screen. The previously exposed plate is then placed in the trough, the developing solution introduced therein, and the ruby glass withdrawn when development commences.

The conditions commonly laid down for the successful prosecution of the experiment are: (1), A chloride plate, inasmuch as one of bromide is usually too opaque; (2), correct exposure; (3), the ferrous-oxalate developer, which presents a non-actinic medium to the illuminant. Possibly, however, a selected thin bromide plate might serve, and other developers besides iron under suitable circumstances, be available. Hence, not merely the normal development and growth of the image, but the phenomena of under or over-exposure, surface fog, the control of different developers in various degrees of dilution over detail, density, and rapidity of development; the effect of bromide; the processes of fixing, reduction, and intensification; paper development, and other photographic operations, might be objectively demonstrated to large audiences in this way. It has also been suggested that the actual retouching of the negative should, by means of a suitable optical system, be shown on the screen. To this point, however, we may possibly advert on another occasion.

Considering the ease with which lantern slides may be made now, it is also permissible to suggest that this method may supersede the old plan of showing diagrams, &c., in illustration of a paper, and that in other respects the lantern may supplant the time-honoured blackboard in many emergencies where it is desired to instruct as well as to inform a photographic audience.

LANTERN NOTES AND NEWS.

Two months ago we stated that the lantern was to be employed at the new Trafalgar-square Theatre for projecting pictures upon a plain act-drop between the acts. It seems that the idea was put into use on Saturday evening last, but scarcely in the manner we had anticipated. A theatrical contemporary remarks that "the management presented a number of advertisements on a white sheet, which took the place of the ordinary curtain, but the marked disapproval with which this intrusion was received will, no doubt, result in its discontinuance. With the newspapers and the public hoardings at the service of advertisers, to say nothing of the programme of the Trafalgar-square Theatre, Mr. Levenston may be recommended to let the advertisement-curtain drop." The employment of the drop-curtain for the display of painted advertisements is a device that is tolerated in very small music halls, &c., in London and the country, a fact which may have induced the Trafalgar Square management to conceive the error that the audience of a first-class West-end place of amusement would put up with the same kind of thing. We are doubtful whether people want to do anything but gossip and look about them between the acts of a play, and we are therefore not over-confident that optical projections at the theatre are worth troubling about on the part of managers.

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A paragraph recently appeared in one of the newspapers implying that the lantern industry is suffering from depression just now. Like other items of technical news which one reads in the daily press, it is not above suspicion on the score of reliability. During the last

few weeks we have had opportunities of learning from many of those concerned in the lantern trade that the state of business with them is of a satisfactory nature, a condition of things which, in all probability, is fairly typical of lanterniana just now.

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A few weeks back a Committee was formed in one of the London parishes with the view of organizing suitable entertainments for the inmates of the local workhouse, and now we observe that the members of one of the South London Photographic Societies have commenced a series of lantern nights free to the public. To our thinking the one idea connects itself with the other. This and other Societies might now and then well get up an occasional lantern evening for the delectation of the poor people in the workhouses, and we throw out the hint in the hope that it will be taken advantage of. Such a kindly act, we are sure, would be welcomed in the right spirit by many Boards of Guardians.

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Our readers will remember that about a year ago two gas explosions in connexion with the lantern occurred, one at Ilkeston and one at a well-known London photographic society. In the latter case it was thought by many that the explosion was due to the employment on the oxygen cylinder of a gauge into which oil had gained admission, and we were informed that in consequence of this it was resolved to discontinue the use of gauges and to purchase a balance. The balance was duly bought, but, if we are rightly advised, has never been used. In connexion with the use of gauges, it is interesting to note some remarks on the subject by Mr. C. F. Budenberg at a recent meeting of the Liverpool Amateur Association. That gentleman said that there was no occasion for the least risk of danger in the use of a gauge so long as the user took care to ascertain that he got a well-made article. He stated that, while inferior gauge-tubes were made out of ordinary drawn steel tubing roughly finished, the reliable instruments were made from pressed octagonal steel bars bored, and afterwards carefully turned, and polished inside and outside. By fixing one of each kind of instrument upon a pressure-pump, he showed that the first was strained and rendered unreliable by being submitted to the ordinary pressure, and would easily have burst if the pressure had been slightly increased; but the second, after a pressure of several tons, returned to its original position without showing a fraction of displacement. Mr. Budenberg then referred to explosions which had been caused by turning the full force of oxygen into a gauge in which traces of oil remained. The intense heat generated by the sudden rush of gas rapidly consumed the oil, and an explosion was the result. This action was shown by placing a piece of wood in a brass tube, which was attached to a cyliuder charged with air. When the valve was suddenly opened the rush of air ignited the wood. The best gauges, the lecturer explained, were now made with a check, to prevent this sudden inrush of gas, so that, even if they were charged with inflammable oil, an explosion could not result. The latter statement should go far to dispel whatever fears have grown up as to the assumed dangers in using pressure gauges.

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The Hackney Society is apparently fated to have trouble left behind from its exhibitions. Last year the Judges had to take action with regard to certain remarks passed on them in a now extinct publication; this year there is talk of litigation over the withdrawal of a medal awarded for a certain set of lantern slides, which, although not supposed to have received an award before, are alleged to have previously obtained a medal elsewhere. Rumour also says that trouble is likely to occur in reference to the *bona fides* of a certain set of hand-camera pictures which were shewn.

LANTERN SLIDES IN COLLODION AND GELATINE.

A couple of years ago, had I been asked to express an opinion on the relative values of collodion and gelatine plates for lantern-slide purposes, I should have unhesitatingly given it in favour of the former, but the improvements made since then in commercial gelatine antern plates, as well, perhaps, as an increased amount of care in their use, have made the question a far more difficult one to solve in an off-hand manner. Undoubtedly collodion has some advantages, more especially in the direction of variety of tone and absolute clearness of lights; that is to say, these qualities are attainable with less trouble than is the case with gelatine, though nowadays, in moderately careful hands, the latter plates are little, if at all, behind their rivals in this respect, while their extra rapidity places them far in front.

Possibly, if contact printing were the invariable rule, the slower collodion plates would enjoy a greater popularity, for, even with artificial light, the average exposure necessary is not inconveniently long; but, even when quarter-plate negatives alone are employed, it very frequently happens that slight reduction of the image is essential in order to include just the right amount of subject to produce the best results. Then, except with daylight, and that of fairly good quality, the camera exposure becomes too protracted to render the collodion processes available for amateurs' use, as their work must generally be performed in the evening.

Much has been written on the weak points of gelatine for transparency-work and on the precautions to be taken in order to avoid them or to reduce them to a minimum; but many of the chief defects have already been removed by the manufacturers, who, by the introduction of special plates of a less rapid character than those intended for negative work, have been able to greatly improve their qualities for the work in question. The high temperature or other conditions requisite in the production of a highly sensitive emulsion being no longer necessary, it is easy to prepare films that will develop entirely free from the slight veil that too often marks even the best of rapid plates, and which, though quite immaterial in a negative, is out of place in a lantern slide. Greater care, too, in the prevention of the formation of insoluble salts of lime in the emulsion during its preparation, has now left the onus almost entirely on the user of the plates of turning out results scarcely, if at all, inferior in brilliancy and clearness to the best collodion work.

Still, some little extra care is expected at the hands of the producer of lantern slides if he hopes to emulate collodion results, but it is not of a very serious character. It consists chiefly, as in the preparation of the emulsion, in avoiding any treatment that may tend to precipitate lime salts from the water used in development and washing. The most obvious way out of the difficulty is to use nothing but distilled water—a plan, however, which, I fear, is impracticable in the great majority of cases, while it is almost equally hopeless, especially in large towns, to rely upon a constant supply of rain or soft water. Much may, however, be done in mitigating the trouble, even with the hardest water, by avoiding the conditions which chiefly lead to such precipitation. The water, for instance, used for the first washing of the plates after development, as well as for mixing the developer, may be artificially softened by any of the well-known methods, the simplest of which is to add a few drops of ammonia, and then allow the insoluble matters to subside; and if the softened water can be boiled after this treatment, or before subsidence, so much the better.

When ammonia, carbonate of soda, or potash, is added to a "hard" water containing lime or barium salts in solution, a precipitate is pretty certain to be formed, so that, in washing a plate after development with ordinary tap water, the alkali remaining in and on the film is calculated to produce this result, and, what is worse, the precipitate occurs *in* as well as on its surface. From the surface it may be removed by simple mechanical means, but it is not so easily got out of the gelatine again by the application of solvents, and this is an instance where prevention is decidedly better than cure. Citric and oxalic acids, too, tend towards the formation of insoluble compounds with both lime and barium, which are constantly present in hard water; therefore cleaning solutions containing these acids are to be avoided. Hydrochloric and nitric acids are free from this tendency, and should therefore be preferred, but it is better still to refrain altogether from the use of the ordinary clearing solutions containing alum.

Wherever sodium sulphite is employed, as it is in most modern developing formulæ, the image will be, or ought to be, free from stain, so that a clearing solution, in the ordinarily accepted meaning of the term, is unnecessary. But, as a safeguard against the formation of insoluble salts by the action of the spent developer, the plate should

be first of all immersed in water rendered very slightly acid with either hydrochloric or nitric acid; two or three minims of the ordinary commercial acid to each ounce of water will suffice to neutralise the alkali remaining without exercising any injurious action upon either the image or the gelatine film itself. After this treatment, boiled or softened water may be used with safety, or, if absolutely necessary, ordinary tap water; but in the last case the plate should pass through two or three changes of acidified water before final washing and fixing.

There is not much danger in the use of tap water after fixing, but before drying the film it should be carefully and gently rubbed with a well-moistened tuft of cotton wool, or, better still, with a pad of soft chamois leather thoroughly saturated. The latter forms a soft velvety rubber with which it is almost impossible to injure the gelatine surface, while it suffices to remove any sediment that may be mechanically attached to the film. A single trial of this plan upon a portion only of a plate developed in the ordinary way and washed with common tap water will show, after drying, how necessary the treatment is. Finally, after drying the transparency it should be warmed and again polished, this time with a perfectly dry pad of cotton wool or washleather lightly but firmly applied.

With these slight precautions, which take more time to describe than to carry out, the lights of a gelatine transparency will be as clear as those of the best collodion, provided, of course, the same care has been exercised in the preparation of the plates. It may be, however, that from some cause or another carelessness on the part of the plate-maker or of the user, that a slight veil still shows itself in or on the film, or such may arise from the gelatine itself being not perfectly transparent. Most of those who have ever practised emulsion-making will have noticed that with many samples of sheet gelatine there is a dusty appearance on the dry sheets which disappears when the gelatine is wetted but reappears on the dried film. The only remedy in such cases is to varnish the transparency, a practice which is tabooed by many operators, though I can see no valid reasons for their objection if the operation is carefully performed. The objection to varnishing seems to have taken its rise from the fact that, under certain conditions, the image on a gelatine plate—and for that matter on a collodion plate also—possesses a certain amount of relief which is further accentuated by the application of any of the ordinary quick-setting spirituous varnishes, with the result that a sort of ridge is formed wherever a shadow cuts sharply against a light, and consequently the definition is interfered with when the picture is thrown on the screen.

But this result only occurs in the case of a gelatine plate when its drying has been hastened by the application of heat or alcohol, and frequently in collodion plates, when the image has been developed or intensified with silver. Even then the evil only becomes appreciable when a thick varnish is employed, such as is necessary for the protection of a negative film. For the purpose of destroying the slight veil on a transparency we only require an extremely thin film of gum or resin, which acts in much the same manner upon the veil as oil or wax upon a paper negative, and any ordinary negative varnish of good quality, diluted three or four times with alcohol, will answer fairly well. But a plain solution of shellac is to be preferred, as giving a harder and more even coat. Bleached lac forms the lightest-coloured varnish, but it is liable, if not of good quality, when first dissolved to lose its transparency afterwards, for which reason a really good sample of orange lac is preferable, as, though its colour in solution may appear very dark, it is scarcely, if at all, noticeable on the glass. Another useful varnish is made by dissolving celluloid in acetate of amyl. These should not be applied until the transparency is perfectly dry, and in using the spirit varnish the plate should be thoroughly warmed—but not made hot, or ridges may be formed—and kept warm until the varnish has completely set or even dried.

Another useful varnish of an aqueous nature is made by boiling five parts of bleached lac and one part of borax in twenty parts of water until the lac is dissolved; the solution is then filtered and set aside for some days, until a fine sediment settles out of it and leaves it perfectly bright, when the clear portion is decanted for use. This is applied to the transparency by pouring it on to the latter on a levelling stand after drying, using a camel's-hair brush or a strip of paper to lead it over the surface. Allow it to soak for a few minutes, when the dry gelatine will absorb a certain quantity, and, after pouring off the surplus as closely as possible, further absorption will take place, and the surface of the film will assume a beautifully smooth and even appearance, which remains after it has become thoroughly dry. This varnish, after once drying, forms a perfect protection against moisture, but has a tendency to crack at a very high temperature.

A second aqueous solution consists simply of diluted albumen, but its preparation requires some little care. Take the white of an ordinary-sized egg, measuring, say, a fluid ounce, add six minims of strong ammonia, and stir well for two or three minutes. Then add gradually five ounces of distilled water, and mix the whole very thoroughly by vigorous *stirring*, not by beating or shaking. The result will be a rather cloudy solution containing a quantity of flocculent and stringy matter, which, however, is removed by filtration, leaving the liquid perfectly clear and bright. If the mixture be beaten or shaken, a part of the insoluble matter will be broken up into so fine a state of division as to pass through the filter and leave an opalescent solution, which is what we have to avoid. This is applied in the same manner as the preceding, and is free from the tendency to crack at a high temperature. It is needless to say that the transparency must be perfectly free from dust before applying the varnish, and must be protected until dry.

Collodion transparencies also suffer occasionally from a species of opalescence arising from a different cause, and differing from fog or veil arising from development. Unsuitable pyroxyline is to blame in this instance, the collodion, although perfectly transparent and bright, drying with a more or less opalescent appearance that detracts from the brightness of the image. This, like the opalescence arising from lime in the gelatine film, disappears when the image is wetted or varnished, and may be remedied by the application of any of the preparations already described. The two first are applied to the dry film with the same precautions as in the case of gelatine plates, and the remaining two are better applied before drying when the pores of the film are still open, by pouring on and off two or three times until the protective solution has thoroughly displaced the water remaining on the surface. The plate is then reared on edge to drain and dry.

If these simple precautions be attended to, not only will the lights of the transparencies produced approach more closely to the description of "clear glass," but there will be fewer complaints against the plates and their makers.

W. B. Bolton.

LANTERN MEMS.

Dissolving taps should be periodically tested, to see that the plugs have not worked loose, for defective dissolvers, either in construction or from working loose, are a far more common cause of pops than generally thought.

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On several occasions what was supposed to be faulty jets fitted to biunial lanterns turned out to be the failure of dissolver. If any doubt, reverse the connecting tubes from the dissolver, so that the supply is different. Then light up again and dissolve. If the plug is dry, the gas will sometimes find its way from one side to the other.

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If tubes are taken off at any time, bear in mind that, with the star shape six-way dissolvers, the opposite corner tubes *diagonally* are connected to the same jet. For instance, the top right-hand tube, say, for hydrogen, and bottom left for oxygen to the one jet, and bottom right-hand (Hy.) and top left-hand (Ox.) to the other jet. The central tube being the supply in each case, hydrogen on the right and oxygen on the left, or as marked on the taps of stopcocks on cross tubes or by-passes.

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Curtain shutters for rolling up effects are often made in one piece, and then not cut, so that there is a proper interval between the opening and bottom of shutter. The effect on the screen from this is that a *broad* interval of black (or white) shows between the curtain and picture, or between the one picture being rolled up and the other that is being revealed. This is obviated by having an adjusting slide to shorten or lengthen the interval mentioned according to the focus of objectives employed and the angle of the fronts.

In the higher class of biunial and triple lanterns, this arrangement, instead of being a strip of metal adjusting by slotted pieces and screw heads, is an entire supplemental slide, and is controlled from the top of shutter by a milled head adjusting screw. This same slide draws right up so as to reveal the entire opening in front of condenser and behind the slide in the stage, and thus permits of the curtain shutter remaining in the lantern all the time.

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Four-legged stands for lanterns are taking the place of three, and are much liked because they are firmer, do not spread out so far, and so do not occupy so much room as the tripod, besides which, are not so likely to be capsized from an accidental touch or kick. A steady stand for apparatus goes a long way towards the satisfactory exhibition of slides, for nothing is worse than pictures on the dance.

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Oxygen gas is to be produced by electricity from atmospheric air, and I hear that one firm, having an amount of power running to waste, contemplate putting gas so made on the market. The cost is mentioned at a remarkably small figure for production, but the transit in bulk to London and the larger cities and centres, as well as distribution in marketable quantities after the compression in cylinders, will represent the chief outlay; but, including all this, the price per cubic foot is computed at a lower figure than any oxygen gas at present supplied. As regards purity, it is supposed to be all that can be desired.

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If operators would label their cylinders they would not get astray as they sometimes now do; and besides, if a leather label is used, and a card marked each time the gas is used, and the duration of use stated, they will have a fair idea of the remaining contents without gauging.

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With the greater knowledge possessed now by pressure gauge makers, the absence of oil from fittings, safety checks, ventilating doors, &c., pressure gauges can be used without fear, and no operator need start an exhibition without knowing he has enough gas, especially as gauges can now be had from 15*s.* upwards, or scales used for weighing.

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I heard of an "old hand" operating the other evening for one of the popular lecturers of the day, and although questioned as to quantity of gas, and pooh-poohing the suggestion that there did not seem to be enough gas for the lecture (after setting up and trying lantern for discs, &c.) the light failed within half-a-dozen pictures of the conclusion of lecture.

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Automatic regulators are, to my mind, preferable without stop-cocks to the outlets, for, if too severe a strain is put upon the valves or bellows from any cause, the indiarubber connexion to the jet would give before the works or cover of regulator did. The number of regulators used during the past three years, and with so few failures, have established their success, and if treated with reasonable care should have a long life.

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The valves of gas cylinders should never be opened with a rush, and, if the screw is difficult to turn, call attention to the same when sending the cylinder to be refilled, and have it eased. If obliged to use a cylinder with very tight or jammed-up screw, don't make the gauge or regulator connexion gas-tight until the cylinder valve is opened a little. Then in case of a rush of gas, it will harmlessly escape around the connexions. The regulator or gauge can then be tightened up.

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The nut around screw valve of cylinder sometimes gets loose. It should be tightened up with a wrench on receiving it back from the compressor or optician, and periodically examined to see if it is quite tight by trying if the nut will screw up tighter.

G. R. Baker.

LANTERN SHOWS AT HOME.

There is no disputing that the exhibition of pictures by the aid of the optical lantern is not only one of the most amusing and interesting, but at the same time popular, methods of making an agreeable variation to the usual occupation of social gatherings—especially now that so many dabble in photography, and turn out work more or less creditable, so that they are able to bring back pictorial records of places they have visited, and by the aid of the optical lantern renew their acquaintance, to their own gratification and that of their friends. However, with the best intentions, many experience a difficulty in making the lantern projection the success it would be in skilled hands, even when supplied with the most irreproachable appliances; and it is to these that the following article may be of some assistance.

We will presume that the lantern and slides are good, the difficulty being to get satisfactory pictures on the screen. The usual faults are unevenness of lighting and definition, unsymmetrical forms, architectural subjects anything but upright, variations of the intensity of the light, badly burning wicks filling the room with smoke and blacks, with an offensive odour, and a general irregularity in the show anything but satisfactory to either audience or operator.

In getting up a lantern exhibition at a private house, the first consideration is the apartment to be used for it. The chief difference between a private and public show of this kind is the size of the image thrown on the screen, and consequently of the screen itself; also the distance from which it is viewed. We find when we do not use sufficient care in levelling a photographic camera the upright lines in the subject are distorted; the same rule holds good with the lantern, unless we have it and the surface on which the image is projected at right angles with each other, a similar distortion takes place. It is therefore a primary and invariable rule that the screen and projected picture must be at right angles with each other, or the parallelism of straight lines will be destroyed. The height of the lantern should be equal to the centre of the screen on which the pictures are thrown, and well clear of the heads of the audience. If much lower than the centre, the lantern must be inclined upwards, and the screen also tilted forward at top to correspond.

For a display in an ordinary dwelling-house, there is seldom much difficulty in fixing the lantern at a proper altitude. There are two methods of showing the pictures, one on an opaque screen and the other on a semi-transparent one. When the projections are of small size—say, not exceeding four feet—the latter method is much to be preferred, as the brilliancy of the picture is greatly enhanced, little or no light being absorbed by the screen. But, supposing we require a disc twelve feet or more in diameter, the opaque screen is best.

Now, about the room. The greater number of houses have two rooms separated by folding doors, which is an excellent arrangement for a lantern show through a semi-transparent screen. To utilise them, the doors must be thrown fully open, curtains draped artistically on each side—a valance at top improves the effect—and the centre part filled with a fine linen sheet stretched tightly, and free as possible from seams and defects; if joins are unavoidable, they should run horizontally in preference to vertically, as the sky shows the least markings, and by the horizontal arrangement the seams are in a great measure hidden by the subject, or at least but little noticeable. In lieu of a sheet, tracing paper stretched on a light frame forms an excellent screen. The chief drawback to its use is its liability to damage and its somewhat restricted size, for it is almost impossible to join tracing paper satisfactorily. Tracing paper at least four feet in width is readily procurable, and thus permits of a pretty-sized picture being thrown on it for an apartment of somewhat limited area. Setting aside the matter of size, the material possesses all the qualities required for a good semi-transparent screen.

A picture six or eight feet in diameter is sufficient for most home shows, and it may be borne in mind the smaller the picture the brighter the image; on this account the smaller image on the tracing paper screen more than makes up in brilliance and quality for the larger one seen on a reflecting surface.

Supposing we have to use a linen or other sheet, it must be carefully stretched and tacked over the doorway, beginning the tacking along the top and seeing that it hangs quite evenly, stretching the sheet gently from nail to nail. Now tack the two lower corners, then one side, the tacks being about six inches apart. In fastening the other side great care must be exercised not to stretch the material to form puckers and ridges, and it is probable that the two lower corners first fastened will now require a little attention; a few tacks along the floor will complete the screen. Wetting it all over with water, applied with a syringe or sponge, will improve the transparency and remove creases, and also increase the tautness of the strain, making it smooth as a drumhead. A bucket of clean water and a syringe may be kept in readiness, to wet the screen occasionally during the exhibition.

If only one large room is available, the sheet is best carefully hung at one end. Of course, transparency in this case is an objection, the whiter and more solid the appearance the better, so that as much light is reflected from it as possible. If the screen is buried, a portable frame is usually sent, to which it is attached by tapes, sewn at intervals along its edges.

In most private houses bare walls are unsuitable from a lanternist's point of view, when a room *can* be had with white-

washed for very pale-coloured walls, the necessity for any other screen is done away with, the walls themselves supplying the best of surfaces, absorbing a minimum amount of light. It goes without saying the surface should be free from any projection whatever, pegs, nails, or markings.

The screen being provided, the position of the lantern must be next attended to. It is best placed at a height about equal to the centre of the screen and carefully levelled, its distance from the screen determining the size of the picture, the nearer the screen the smaller the image, and *vice versâ*. Some lantern exhibitors alter the distance during the show if a transmitted picture is shown, and the apparatus small and handy; but a fixed position is nearly always best, and more convenient in every way. The lantern being placed, it is lighted up and the proper adjustments made between the condenser and the burner, so that a *clearly* illuminated disc is thrown on the screen. If we find that wavy, dark, crescent-shaped marks appear, it indicates that the light and screen are not in the proper place with regard to each other, or that the light is too large. The proper adjustment being effected, a test slide is inserted, and carefully focussed. This slide generally consists of printed matter covering the whole of the disc; the definition of the edges should be equal to the centre, which in printed matter is easily determined, more so than by any other kind of slide, although a good diatom slide runs it very close.

If it is an oil lamp, with several wicks, much depends on trimming them properly, both as to the quantity and quality of the light. There is considerable art required to properly trim a lamp; simple as it seems, it is a *sine quâ non* that the wicks should be accurately and smoothly trimmed; the least projection from them, as little bits of cotton not properly cut off, will make the lamp smoke, or the wicks, although level, being higher on one side than the other, will do the same thing if turned up to their full working height. It is a good plan to burn them a short time and then rub off the charred portion with a piece of soft paper, leaving no bits sticking about the burner. Any neglect in this respect will make itself apparent before the lantern has been long used by disagreeable odours, and probably a shower of blacks. The condenser will be dimmed, and the pictures restrained in brilliancy. In addition to the wicks receiving proper attention, all oil should be carefully wiped off the outside of the lamp, as when heated an unpleasant smell will be evolved. A good oil lantern properly attended to will give a more pleasant light for small pictures than the limelight, let alone the simplicity of working.

Compound gas in cylinders is certainly to be preferred if the screen is large and the lantern a considerable distance from it. There is, however, a certain amount of risk unless used with great care and circumspection, and by some one thoroughly acquainted with the management of the limelight. Accidents will occasionally happen with the most experienced, from circumstances that seem to be altogether beyond control, and therefore, for home displays, a good oil lamp is preferable, and will afford every satisfaction. It must be borne in mind that slides meant for use in an oil lantern must be thinner than if designed for the limelight, the penetration of the two lights being so very different; a slide that would be perfect in density for the limelight would be muddy and thick with an oil lamp, and *vice versâ*.

The lantern should be lighted a little time before the exhibition commences in order to warm it all equally, as in cold weather, when lantern shows are generally given, moisture will condense on the lens or condenser, and interfere with the display. This equalisation of temperature applies to the slides themselves, which, if placed cold in the lantern, will be almost obliterated on the screen by condensed moisture, which will take a little time to evaporate, not only spoiling the effect, but unpleasantly hindering the exhibition. The slides should be placed in a warm room, or before a fire, if they are brought out in a much cooler temperature than that they will be exhibited in, in order to prevent this.

To save trouble, all slides may be conveniently marked with two white spots on the top margin of the front, readily seen in the subdued light of the room, which at once indicates the proper way of inserting them in the lantern and prevents the mistake of showing a picture wrong side up or outwards without them having to perform that shining-up and twisting-about examination that often fails to answer the purpose. All slides to be shown are best arranged by daylight in their proper order and position, especially if a lecture or description is attached, to be read by some one unfamiliar with the slides themselves, or it may happen that a view of a cathedral, with a procession, may be described as a group of niggers on the beach, or something equally inappropriate.

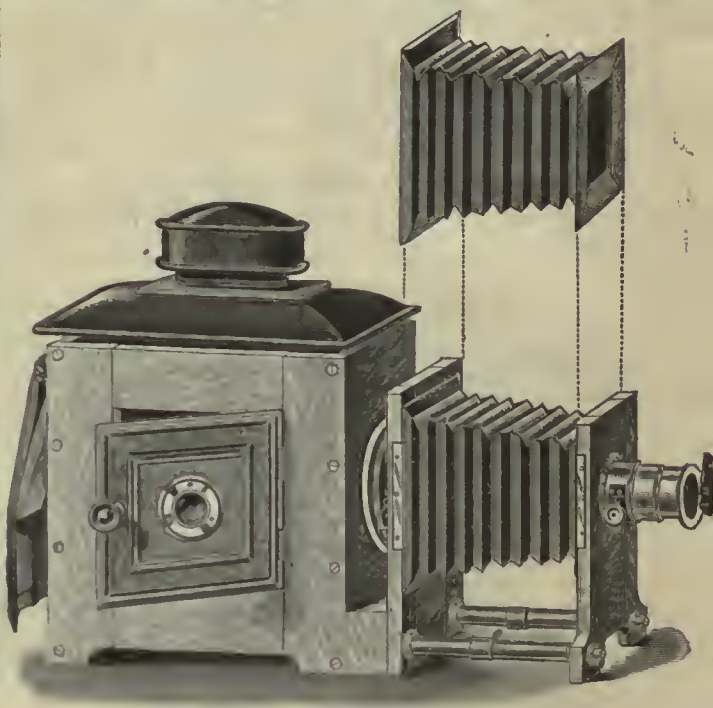
Music is a capital addition to any lantern show, and keeps the whole thing going as it were, and if the tunes chosen chime in, as it were, with the pictures, it adds considerably to the effect. In this connexion I would suggest that amateurs should spend a little time in stringing together a history of their slides, that they could read off during the exhibition. We have most of us heard with what difficulty the simplest description is often given when it has not been prepared beforehand. Many points are forgotten that would add considerable value if known; in fact, a very uninteresting picture pictorially might represent something of the most intense interest if we only knew, when we were looking at it, what it was.

EDWARD DUNMORE.

RECENT LANTERN NOVELTIES.

THE "LOTHIAN" OPTICAL LANTERN.

THIS lantern, which has been introduced by Mr. A. H. Baird, of 15 Lothian-street, Edinburgh, may be used for either oil or limelight. The body is made of polished mahogany, and the inside corners are iron-bound to prevent warping with heat. There are two panelled doors, with brass-bound, neutral-tinted sight holes, and a curtain behind to prevent stray light from affecting the eyes of the audience. The stage is open at



the top, and can accommodate any size or style of framed slide. The objective is mounted in a special jacket fitting, so that another lens o different focus can be inserted without unscrewing. The bellows front has a draw of from 5 to 14 inches, this varying length admitting of the use of an objective of any focal length. The bellows can be taken out as shown in the cut, to enable the lecturer to demonstrate in the lantern many experiments in physics which cannot well be seen under ordinary conditions by a large audience.

THE COMBINATION LANTERN SLIDE COVER GLASS AND SPOT BINDER.

MESSRS. W. BUTCHER & SON, of Blackheath, have introduced these cover glasses, upon which strips of binding are attached so that the slide may

be placed *in situ* and bound up quickly. The idea should be welcome to makers of lantern slides.

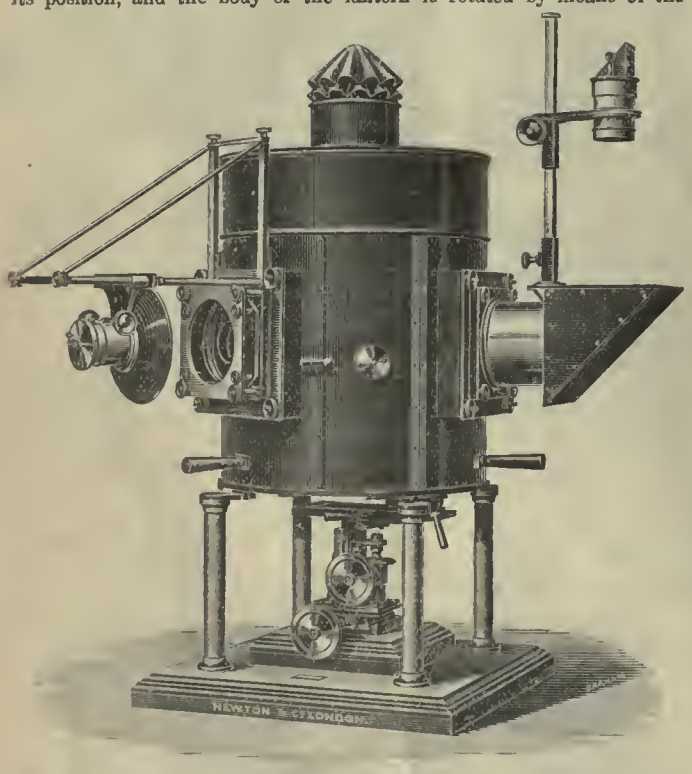
Mr. W. Tylar, of Waterloo-road, is issuing a lantern objective which is characterised by excellent flatness of field and covering power.

The Paget Prize Plate Company have two series of lantern plates on the market—the rapid, which give black tones with short exposures; and the slow, which give a variety of tones from black to red. We have tried the plates, and find them to give admirable results. The display of slides which the Company had on view at the recent Hackney Exhibition was of remarkable excellence as regards clearness, brilliancy, and diversity of tone. A new printing-out lantern plate is among the Company's imminent novelties.

Messrs. Newton & Co., of 3, Fleet-street, have just issued a new catalogue of science lanterns, magic lanterns, dissolving-view apparatus, and lantern slides. In its pages are contained illustrated descriptions of numerous single oil lanterns, limelight lanterns, biunials and triples, microscope attachments, and the numerous accessories of the ordinary lantern, while a section of the work is devoted to science lanterns pure and simple, with projection apparatus, microscopes, polariscopes, &c., for scientific demonstrations. Among these are included triple rotating electric lanterns; and in the work will also be found lists of objects for the polariscope, and a large and comprehensive general list of paintings, views, and figure subjects. The catalogue, with two supplements, is a complete guide to purchasers of lantern apparatus, from the simplest to the most up-to-date scientific kinds.

A Triple Rotating Electric Lantern.

We have had the opportunity of inspecting one of these lanterns, which are a speciality of Messrs. Newton & Co. As will be seen, the body of the lantern is cylindrical, and it is mounted on four brass pillars and mahogany stand. It can be arranged for use with any arc lamp. The base is fitted with a traversing table, which has screw motions travelling in gun-metal dovetails. This admits of the arc light being centred and kept absolutely central during use. The traversing table is made of polished gun-metal and steel, and steady motions in every direction are obtained by the large milled heads. The arc light is kept in its position, and the body of the lantern is rotated by means of the



handles bringing each front in turn opposite the fixed light, thus obviating the necessity of constant adjustments, and enabling any front to be used at a moment's notice without delay or trouble. A check action is provided to ensure exact centreing. The lantern body is furnished with three doors and sight holes, so that whichever optical system may be in use, there is always a door immediately behind the lamp, and a dark-glass sight hole in front, through which the arc may be observed. There are three fronts, each carrying an optical system, placed at angles of 120 degrees to each other, and the rotating movement brings up each as desired in front of the fixed light. One of these fronts is fitted with a 4½ in. double condenser for parallel beam work, and with diaphragm and slit fronts. A second front carries also a 4½ in. condenser with slide stage and double achromatic objective for exhibiting ordinary slides and diagrams. Either of these fronts will carry, if desired, a polariscope, a Wright's optical front, a small parallel-beam nozzle, or a vertical attachment. The third front is fitted with an electric microscope and micro-polariscope. All the fronts are detachable and interchangeable. The lantern can be used for the lime as well as the electric light. We understand that this form of lantern is in considerable use by scientific institutions, for which it seems eminently well adapted. In perfection and completeness of detail it is undoubtedly a fine instrument.

THE REFLECTOR WITH THE PROJECTION MICROSCOPE.

[*Nature.*]

The lantern is now used for so many purposes—scientific, photographic, and recreative—that any improvement in its construction will be acceptable. When we look into this instrument whilst at work, we must be disappointed at the large quantity of light lost by reflection and by dispersion—light which ought to go to the illumination of the screen. In the ordinary form of the lantern, three lenses of dense glass are employed as condensers. Each of these six surfaces reflects and scatters the light, and the glass itself is absorbent of its rays.

The dioptric construction of the projection lantern has been well worked out by Messrs. Wright, Newton, Salomons, and others, but the catoptric principle, which would eliminate almost entirely these disadvantages, has been scarcely at all studied.

Although my experiments have been made solely with the limelight in various forms, the following remarks may equally apply to light given by the electric arc:—

If a reflector be used instead of the ordinary condensers, it is obvious that the position of the lime cylinder must be reversed. This will present no difficulty, for the tube holding the jet can be bent into a helical form. The dark image of the lime cylinder also will have no more practical disadvantage than is experienced by a like image formed by the small plane speculum of the Newtonian telescope.

As to the mirror itself, although a parabolic form is the most correct, a spherical surface will be sufficient for mere illuminating purposes, and thus expense may be spared in the grinding of the more difficult curve. A speculum of from five to seven inches diameter, having a radial curvation of from two and a half to three inches, will grasp a large quantity of light, much more than that obtainable from the five-inch condenser usually employed.

Silver deposited by one of the various reducing processes on the surface of a clear glass lens will have many advantages over a metal mirror. The front surface will give perhaps the finest definition, but by silvering the back part of a spherical glass film, or that of a ground lens, the brilliant surface will remain untarnished for an indefinite time, and the whitish bloom formed by slow volatilisation of the incandescent lime is easily removed. This silver film adheres with remarkable tenacity, and it will bear a great deal of heat without blistering or becoming detached.

I have had considerable success in constructing such mirrors from the large ornamental glass spheres blown in Germany, and silvered within by Liebig's process, viz., with milk, sugar, and ammonio-nitrate of silver. A glass sphere of ten or eleven inches in diameter may be easily cut into eight or nine mirrors by a red-hot iron, and this without disturbing the silvering, which will require only gentle friction with a pad of cotton impregnated with a trifle of rouge to brighten it. Thus, at the cost of a few shillings, eight or more mirrors can be made, and also provision be made against possible accidents of cracking by heat.

The light radiant is so placed that the secondary focus is intercepted by a plano-concave lens of dense glass, as has been happily proposed by Mr. L. Wright. The convergent rays from the speculum are thus made into a parallel beam, which must be deprived of its heat by an alum trough, for the light and heat at the substage condenser is very great.

Convergence, I find, is usefully promoted by a plano-convex lens of about eight inches focus, placed two or three inches before the above-noted plano-concave lens. In all other respects the arrangements are like those of the usual modern projection microscope.

I have pretty constantly used the ether-oxygen saturator, and I consider it to be perfectly safe, if ordinary precautions be taken. The oxygen, compressed in cylinders, is much recommended, as there can be no mixture of vapour, except at the right place. The U-shaped horizontal saturator, plugged with flannel, must be well charged with ether, or with the best gasolene, and care should be taken, before beginning or ending an exhibition, to shut off the oxygen tap before closing the ether tap. This will prevent the harmless "snap" from the mixture in the small chamber at the joining of the gas tubes. If a disc more than eight feet be required for the microscope, it will be well to use hydrogen gas instead of ether, since the calibre of the jet cannot in the ether light very well exceed one-fourteenth of an inch.

As an extra security, I pack the mixing chamber with asbestos fibre, moistened with glycerine; but, as before urged, the oxygen must leave the saturator, saturated.

To ensure the coincidence of the foci of the reflector with the optical axis of the microscope, it will be well to place three adjusting screws in a triangle behind the mirror, and this last may have both a small vertical and horizontal movement.

I claim for this catoptric arrangement a larger grasp of light than can be got from ordinary lenses, and this may be effected also at a small outlay. For the amateur constructor the plan will afford many advantages.

G. B. BUCKTON.

SMALL PRISMS FOR LIMELIGHT POLARISCOPES.

[Stereoscopic Club.]

My object this evening is to demonstrate how far the lantern microscope can be depended upon for exhibiting the phenomena of polarised light.

The maximum size objects provided for the ordinary polariscope reach up to one and three-quarter inches, and for these an aperture of about three inches has been considered necessary, and Nicol prisms, or substitutes for them, having similar internal dimensions, were generally recommend.

began to be realised that this was a fact, and at the present day small analysing prisms are adopted in *all* polariscopes.

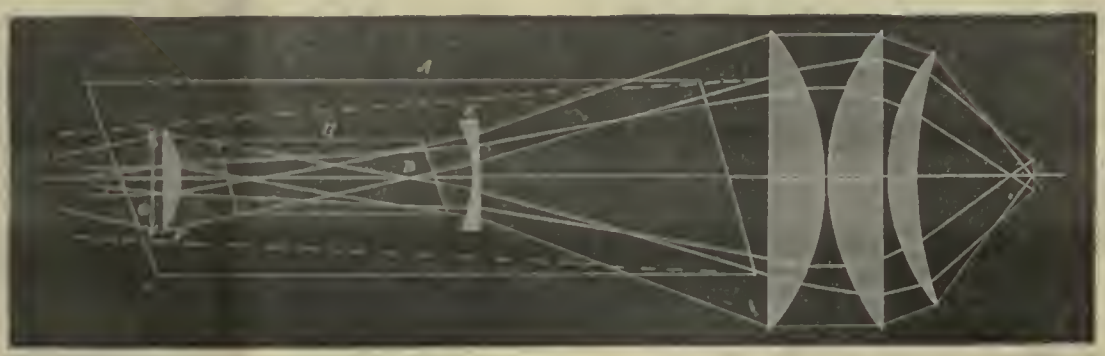
Well, I think the time has arrived for us *to begin to think* that large polarising prisms are just as useless in proportion as large analysers have been found to be, for then we shall the sooner *begin to realise the fact.*

However desirable larger blocks of Iceland spar may be, either as a commercial article or for prisms, or anything else, we know that the natural supply of the mineral has become practically exhausted, and even now a one-inch prism is a precious article. So, as it is a maxim in philosophy that if we cannot bring things up to our mind we must carry our mind down to the level of things as they are, I can console myself by showing that a prism of one-inch field will exhibit the maximum size objects sufficiently well to answer every practicable purpose.

Of course, I shall be fully prepared for some opposition from prejudiced individuals and others commercially interested. Changing from a large to a small prism for analyser was but a small affair, involving no slight alterations in the construction of the instruments, that nothing was affected except the reduced price of the prism; but when it can be shown that with a small lantern microscope having suitable prisms of, say, one-inch or one-and-a-quarter-inch field results can be produced to equal those obtained by the most elaborate instruments, costing 30*l.* to 100*l.*, the case is somewhat different.

Independent of its own cost, a large prism determines in the main the style and cost of the whole instrument, and, as I have said, this large size and elaboration is totally unnecessary, a sheer waste of money and of no benefit to any one but those who are commercially interested.

With the elbow polariscope, a large field is indispensable. The glass plate forming the polariser must be from four to five inches long, by reason of the polarising angle. A less size would not cover the one-and-three-quarter-inch objects, and on account of its form and size, it must of necessity be ungainly in use. I may here refer to a circumstance which occurred the other day as an illustration of this.



A. Large prism with three-inch field.
B. Small prism with one-inch field.
C. Rays passing through large prism.
D. Rays passing through small prism.
E. Concave lens, diminishing the vergency of the rays so as to pass them in the greatest quantity through the prism.
F. Sub-condenser concentrating the rays upon G, the object.

Of course, prisms having only two inches, and even so small as one and a half inch, field have been used, but it has been supposed that these small sizes could not show the maximum size objects. With the lantern microscope, prisms of only three-quarter-inch field have been supplied, but these were intended only for showing microscopic objects, and the instrument as a polariscope was not intended to be used for larger objects.

Let us now inquire if the large size, such as three inches, is at all necessary.

Some very reliable authorities have assured me that they are not, and that prisms of one-and-a-half-inch field are quite sufficient; and now I go a step further, and maintain that, with a one-and-a-quarter, or even a one-inch field, all that is needed can be done. With this small size the loss of light is very appreciable, and the dimension covered is very little less than with the three-inch prism, *if used in the right way.*

In days gone by it was customary to use large prisms, not only for polarisers, but also for analysers. I can remember a friend of mine who possessed a three-inch Nicol polariser expressing his regret that he had not also a three-inch analyser, as the one he was then using had only a two-inch field. Soon after this, however, *it began to be thought* that an analyser of half-inch field gave just about as good results as others of the largest dimensions. As time passed on, *it*

A well-known scientist of Manchester, possessing one of these elbow polariscopes, took it to an optician to be fitted to a new lantern. "No," said the optician; "do not use this obsolete instrument, but let us take the analyser out of it and use it as a polariser." This was done, and as the prism had a full one-inch field, better results were obtained by it, and an analyser of half-inch field, than had ever been obtained, or could ever be obtained, by the elbow polariscope in any way.

The appended diagram, drawn to scale, shows the rival prisms and their arrangement.

The rays pass convergently through the large prism, and do not require a sub-condenser before passing through large objects; but with a small prism a sub-condenser is required because so many rays leave it divergently. A large lantern condenser is not required with the large prism, as nearly all the rays outside the three-inch field are cut off or do not enter the prism. It cannot be used further than shown from the condenser, as that would cause the converging cone to be too small to fill the object, or to enter the objective in the best conditions for evenly illuminating the screen.

Some writers represent the concave lens E as passing the rays through the small prism in lines parallel with its sides, and accordingly call the lens a "parallelising" lens; but, having field lenses of all foci from nine to twenty-two inches, and found none which, wherever

placed or however used, were capable of passing the rays in any such like manner through the prism, I consider the designation misleading, and I do not use it. I do not even pretend that I have correctly represented the rays just as they pass through the lenses and the prism, but the diagram gives a sufficiently accurate idea of the path of the beam to show how it is to be managed when an object has to be illuminated which is larger than the field of the prism, and if the beam is properly managed there is not much to choose at between the illumination obtained by the different prisms, nor the size of objects that may be covered by them.

With the small crystals used in the polariscope, whether uni-axial or bi-axial, shown either by narrow angle or very wide-angle rays, there is no reason why the smaller polarising prism should not bear the palm, seeing that the crystals are so small, and require every advantage in the arrangement for transmitting rays through a very small aperture.

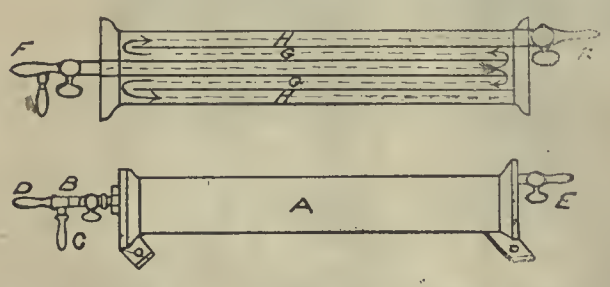
By using a Nicol polariser in the way I have advocated some precaution must be taken against injury to it by transmitted heat, and an alum trough or a water trough does this most effectively. The concave lens undoubtedly affords some protection to the prism, but it may be said to show how small is its effect that I know of three Nicol prisms that have been ruined by heat passing through them where the alum or water trough has inadvertently been omitted. In one of these cases the balsam was blown up into bubbles, and in the other two cases the ends were "frosted" so as to require repolishing.

I confess that a Nicol prism, large or small, is a delicate thing to use in a lantern; it is also costly, whatever be its size. Then those who prefer something less expensive may use polarising bundles (glass plates) with transmitted light, and when placed in the posterior part of the microscope and used just in the same way as the prism, very good results may be obtained by them. I have not unfrequently during an exhibition substituted a bundle for a Nicol, with so little alteration in the result that only an expert could have discovered the difference. Still, the prism gives the most beautiful results, which, for richness and splendour of colour, surpasses everything else in the range of optical science. W. Leach.

A NEW ETHER SATURATOR.

A firm in business at Melbourne, Australia, have just placed on the market a patent saturator for ether that is a great advance on any apparatus yet introduced, being exceedingly well got up, portable, and comprises a three-way saturation in the one tube.

It has been used for many public entertainments with complete success, the light being simply perfect, and quite free from snapping and hissing, troubles with which all users of the ether light are, unfortunately, only too conversant. This is attributed to the perfect saturation of the oxygen gas.



With two barrels so many troubles occurred that the inventors tried what benefit would accrue from the addition of a third barrel, and were gratified at the wonderful success of the extra saturation of the gas; but the apparatus was bulky, so further thought was given to the subject, the outcome being the single barrel with triple saturators. It will be difficult to improve on this.

The following will explain the drawing:—A is a brass tube, fifteen inches long by three and a half. B is the inlet pipe, D connects with bag or cylinder, C to oxygen tap of jet, E delivery tap of saturated gas connecting with H lap of jet. The oxygen from bag or cylinder enters the saturator at F, passes to the bottom of the tube and returns by G, and finally down the outside compartment H to the tap K.

E. Purton.

PEARS' MAGIC LANTERN.

On behalf of Mr. Henry Glave, draper, of Oxford-street, W., Mr. Warmington, Q.C., applied, on October 14, to Mr. Justice Kekewich, in the Chancery Division of the High Court, for an injunction to restrain Messrs. Pears from exhibiting on their premises, opposite those of the plaintiff, magic-lantern pictures or other devices so as to cause crowds to collect and obstruct the highway in front of plaintiff's premises, and to prevent the access of plaintiff's customers to his shop. The learned counsel put in a series of affidavits showing that for some time defendants had exhibited during the evening, from about six to nine or ten o'clock, a series of pictures, some of them movable, from their windows, leading to the assemblage of crowds who filled the pavements and highway, and blocked the approach to plaintiff's shop, besides causing him annoyance by their cheering at intervals and general noise. Sir R. Webster, Q.C. (with him Mr. Renshaw, Q.C.), appearing for the defendants, said they had used these pictures for some four or five years. There was no evidence of crowds until recently, nor was complaint made until search-lights were turned on to obliterate the pictures. As the case would have to be tried, he was willing, on behalf of the defendants, to give an undertaking (which he understood plaintiff's counsel was willing to accept) to exhibit only one picture, instead of a series, until the plaintiff's shop was shut, leaving the movable pictures, which it seemed, sometimes moved the risible faculties of the spectators, till the latter part of the evening, the costs of this motion being costs in the action, which must be left to be tried. Mr. Justice Kekewich said that was a fair offer. Of the law in the case he had no doubt, but the question to be decided was one of fact.

Lantern Queries.

W. Trimmer.—The suggestion to substitute petroleum ether for sulphuric ether in the saturator emanated, we believe, from Mr. F. E. Ives.

St. Elmo (Bath).—We do not know what you mean by "lantern shield," unless it be a species of shield, attached to a jet, for exposing only a part of the lime to the light. Such shields, no doubt, can be obtained to order, but we do not think they are much used. Heat the lime gradually, and the necessity for them disappears.

Doubtful.—Yes; a photograph on paper, if mounted between two glasses, can, at a push, be utilised for projection purposes.

P. Allen (Brixton).—The warm tones you admire may be produced by using a slow lantern plate, giving long exposure, and developing with pyro and ammonium carbonate.

W. R. Cornell writes, suggesting the employment of the optical lantern for projecting *negatives of line* subjects, such as plans, &c., where an enlarged copy is required, which could then be traced by hand.

A. French.—We cannot say if it is the invariable custom of competition lantern slides to be judged on the screen. If it is, then some of the judges at recent exhibitions have held offices which have been no sinecures.

W. M. Fitt (Hanley).—We cannot accept the task you are anxious to impose upon us. Doubtless by looking through the catalogues of the various lantern dealers you may be able to light on particulars of a "complete lantern fit-up for a guinea or so for exhibition purposes."

Jet.—The blow-through form of jet is probably more used than any other, and is on the whole the simplest for a beginner to employ with compressed gases.

R. Fenner.—Several lanterns are, we believe, fitted with a simple piece of mechanism for enabling the lime to be turned without opening the lantern.

Querist.—Oxygen is said to vary in illuminating power according to the method of its preparation: thus many believe the gas made from potash chlorate to be superior to other kinds.

B. Sc. (London).—Possibly Mr. Lewis Wright's book on *Optical Projection* would be useful to you in affording hints as to the employment of the lantern for projection in scientific experiments.

L. Simpson asks: "As I have an oil lantern, and am also a beginner in the black art, would you please tell me how I should proceed to show dry plate development on a screen. Can it be done so as not to fog the plate?"—See article on first page of the Supplement.

LANTERN FIXTURES.

December 5. Richmond Camera Club.
,, 6. Hackney Photographic Society.—Members' Lantern Night.
,, 13. Hackney Photographic Society.—*Print-out Lantern Plates, &c.*, Mr. Walter E. Woodbury.
,, 15. London and Provincial Photographic Association.
,, 15. Oxford Photographic Society.
,, 19. Croydon Camera Club.
,, 20. Hackney Photographic Society.—*Colouring Lantern Slides*, Mr. S. J. Beckett.
,, 21. Manchester Photographic Society.
,, 28. Photographic Club.

Mr. F. V. A. Lloyd, of 5, South John-street, Liverpool, has sent us his catalogue of lantern requisites and slides, of which it contains useful particulars.